

**ONTARIO
SUPERIOR COURT OF JUSTICE**

B E T W E E N :

LESLIE AUSTIN

Plaintiff

- and -

**BELL CANADA, BELL MEDIA INC.,
EXPERTECH NETWORK INSTALLATION INC., and BELL MOBILITY INC.**
Defendants

Proceeding under the *Class Proceedings Act, 1992*

**MOTION RECORD OF THE PLAINTIFF
(Implementation Motion)
(Fee Approval Motion)
(Opt Out Motion)**

Returnable July 9, 2021

VOLUME 3 OF 5

June 25, 2021

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**MOTION RECORD OF THE PLAINTIFF
(Implementation Motion)
(Fee Approval Motion)
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This is Exhibit "F" referred to in the Affidavit of Matthew Baer, sworn before me this this 24th day of June, 2021.

DocuSigned by:
Christina Nolle
416A9D39CDBD474...

A Commissioner, etc.

*Virtually commissioned and electronically signed
pursuant to Ontario Regulation 431/20:
Administering Oath or Declaration Remotely*

Court File No.: CV-18-590105-00CP

**ONTARIO
SUPERIOR COURT OF JUSTICE**

BETWEEN:

LESLIE AUSTIN

Plaintiff

- and -

**BELL CANADA, BELL MEDIA INC.,
EXPERTECH NETWORK INSTALLATION INC., and BELL MOBILITY INC.**
Defendants

Proceeding under the *Class Proceedings Act, 1992*

**MOTION RECORD OF THE PLAINTIFF
(Certification and Summary Judgment Motion
Returnable April 24 & 25, 2019)
VOLUME 1 OF 2**

July 27, 2018

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**MOTION RECORD OF THE PLAINTIFF
(Certification and Summary Judgment Motion)**

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Court File No.: CV-18-590105-00CP

**ONTARIO
SUPERIOR COURT OF JUSTICE**

BETWEEN:

LESLIE AUSTIN

Plaintiff

- and -

**BELL CANADA, BELL MEDIA INC.,
EXPERTECH NETWORK INSTALLATION INC., and BELL MOBILITY INC.**
Defendants

Proceeding under the *Class Proceedings Act, 1992*

**NOTICE OF MOTION
(Certification Motion – Returnable April 24-25, 2019)**

The Plaintiff will make a motion to the Honourable Justice Glustein, on April 24-25, 2019 at 10:00 a.m., or as soon thereafter as the motion can be heard, at Osgoode Hall, 130 Queen Street West, Toronto, Ontario.

PROPOSED METHOD OF HEARING: The motion is to be heard orally.

THE MOTION IS FOR:

- (a) an order certifying this action as a class proceeding pursuant to the *Class Proceedings Act, 1992*, S.O. 1992, c. 6, as amended (the “CPA”);
- (b) an order appointing Leslie Austin as representative plaintiff for the class;
- (c) an order defining the class as:

all persons, wherever resident, who are or were members under the Bell Canada Pension Plan, or otherwise entitled to benefits under the Plan, and who were entitled to receive indexed pension payments pursuant to section 8.7 of the Plan as of January 1, 2017, together with the spouses, estates, heirs, beneficiaries, and representatives of any of the above who has died.

- (d) an order that the within proceeding is certified on the basis of the following common issues:

Breach of Contract

- (i) Did the Defendants owe a contractual obligation to provide pension indexation under the Plan? If so, what amount of pension indexation ought to have been applied and provided in respect of the year 2017?
- (ii) Did the Defendants breach their contractual obligations?

Breach of Trust and Fiduciary Duty

- (iii) Does Bell Canada, as administrator of the Plan, owe a duty as a trustee to the class?
- (iv) If so, did Bell Canada breach its duty as a trustee?
- (v) Did Bell Canada, as administrator of the Plan, owe a fiduciary duty to the class?
- (vi) If so, did Bell Canada breach its fiduciary duty?

Damages

- (vii) If one or more of the above common issues are answered affirmatively, can the amount of damages payable by the Defendants be determined on an aggregate basis? If so, in what amount?
- (e) an order approving the proposed litigation plan;
- (f) an order staying any other proceeding based on the facts giving rise to this proposed class proceeding;

- (g) an order declaring that no other proceeding based upon the facts giving rise to this proceeding may be commenced without leave of the court;
- (h) an order that the defendants shall pay to the plaintiff his costs of this motion plus any applicable taxes; and
- (i) such other relief that counsel may advise and this Honourable Court may permit.

THE GROUNDS FOR THE MOTION ARE:

- (a) this action was commenced on January 16, 2018 pursuant to the *CPA*;
- (b) this action alleges that the Defendants breached their contractual obligations, and breached trust and fiduciary duties through the incorrect approach to indexation under the Bell Canada Pension Plan;
- (c) the pleadings herein disclose causes of action in breach of contract, and breach of trust and fiduciary duty;
- (d) there is a large class that is objectively defined consisting of all persons, wherever resident, who are or were members under the Bell Canada Pension Plan, or otherwise entitled to benefits under the Plan, and who were entitled to receive indexed pension payments pursuant to section 8.7 of the Plan as of January 1, 2017, together with the spouses, estates, heirs, beneficiaries, and representatives of any of the above who has died;
- (e) there is a rational relationship between the class and the common issues and the class is not unnecessarily broad;
- (f) the claims alleged in the Statement of Claim raise common issues, the determination of which will substantially move the litigation forward;

- (g) in light of the access to justice concerns and with regard to achieving judicial economy, a class proceeding is the preferable procedure for resolving these claims;
- (h) a class proceeding in this case would constitute the fairest, most efficient and manageable means of adjudication of the common issues;
- (i) the proposed representative plaintiff Leslie Austin can fairly and adequately represent the interests of the class, with whom he has no conflict on the common issues;
- (j) the proposed representative plaintiff has produced a workable litigation plan for advancing the claims on behalf of the class up to the common issues trial and afterwards;
- (k) the *CPA*;
- (l) *Rules of Civil Procedure*, RRO 1990, Reg 194;
- (m) *Pension Benefits Standards Act*, 1985, RSC 1985, c 32 (2nd Supp);
- (n) *Pension Benefits Standards Regulations*, 1985, SOR/87-19; and,
- (o) such other grounds as counsel may advise and this Honourable Court may permit.

THE FOLLOWING DOCUMENTARY EVIDENCE will be used at the hearing of the motion:

- (a) the affidavit Philip Cross sworn July 20, 2018;
- (b) the affidavit of Cameron McNeill sworn July 24;
- (c) the affidavit of Leslie Austin sworn July 25, 2018; and
- (d) the affidavit of Jasmine Randhawa sworn July 25, 2018.

July 26, 2018

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**ONTARIO
SUPERIOR COURT OF JUSTICE**

Proceeding commenced at Toronto

NOTICE OF MOTION
(Certification Motion - Returnable
April 24-25, 2019)

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Court File No.: CV-18-590105-00CP

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LESLIE AUSTIN

Plaintiff

- and -

**BELL CANADA, BELL MEDIA INC.,
EXPERTECH NETWORK INSTALLATION INC., and BELL MOBILITY INC.**
Defendants

Proceeding under the *Class Proceedings Act, 1992*

**NOTICE OF MOTION
(Summary Judgment Motion)**

The Plaintiff will make a motion to the Honourable Justice Glustein, on a date and time to be determined.

PROPOSED METHOD OF HEARING: The motion is to be heard: orally.

THE MOTION IS FOR:

- (a) Summary Judgment in favour of the Plaintiff and a determination of the common issues, as follows:
- (i) a declaration that the Defendants owed a contractual obligation to provide Pension Indexation under the Bell Canada Pension Plan;
 - (ii) a declaration that the Defendants breached their contractual obligations under the Bell Canada Pension Plan;
 - (iii) a declaration that Bell Canada owed a duty as a trustee to the Class;
 - (iv) a declaration that Bell Canada breached its duty as a trustee;

- (v) a declaration that Bell Canada owed a fiduciary duty to the Class;
 - (vi) a declaration that Bell Canada breached its fiduciary duties to Class;
 - (vii) a determination of the damages sustained by the Class on an aggregate basis.
- (b) Costs of the motion and of this action, fixed and payable forthwith, including interest; and
 - (c) Such further and other relief as counsel may advise and this Honourable Court may permit.

THE GROUNDS FOR THE MOTION ARE:

Background

- (a) At issue in this action is the incorrect approach used in respect of the cost-of-living indexation pursuant to the Bell Canada Pension Plan (the “**Plan**”) for the year 2017;
- (b) Bell Canada is and was, at all times, the administrator of the Plan (the “**Administrator**”);
- (c) Bell Canada, Bell Media Inc., Expertech Network Installation Inc., and Bell Mobility Inc. are participating employers of the Plan and make contributions to the Plan (“**Participating Employers**”);

Breach of Contract

- (d) The Plan is a binding contract between the Defendants and the class. The pension payments to class members constitutes deferred compensation for the Class members' employment;
- (e) The Plan provides for indexation (often referred to as a cost-of-living adjustment) as follows:

8.7 On every first day of January, the retirement benefits payable to a Member, the surviving Spouse or Beneficiary under the DB Provisions shall be augmented by a percentage determined as follows:

(i) If, on the date of the increase, the Member has not reached 65 years of age, or would not have reached 65 years of age in the case of a surviving Spouse or Beneficiary, the Pension Index, limited to a maximum of 2% and calculated on a compounded basis.

(ii) If, on the date of the increase, the Member has reached 65 years of age, or would have reached 65 years of age in the case of a surviving Spouse or Beneficiary, the percentage shall be the greater of:

(a) 60% of the Pension Index, limited to a maximum of 4% and calculated on a compounded basis; or

(b) the percentage determined under paragraph (i) above.

(iii) For the purpose of any increase applicable to a Member, the surviving Spouse or the Beneficiary within the first year of retirement, the applicable percentage shall be prorated, taking into account the number of full calendar months of retirement in the calendar year preceding the date of the increase.

(iv) All percentage increases shall be rounded to the nearest 2 decimal points, except for the percentage increase under paragraph (i) above which shall be rounded to the nearest whole number.

- (f) The term "Pension Index" is defined in Section 1.29 of the Plan as follows:
- "Pension Index" means the annual percentage increase of the Consumer Price Index, as determined by Statistics Canada, during the period of November 1 to October 31 immediately preceding the date of the pension increase.
- (g) Statistics Canada determines and publishes the annual percentage increase of the Consumer Price Index ("CPI") on its website;
- (h) the Plan requires that indexation be determined by using the CPI percentage increase as determined and published by Statistics Canada;
- (i) On November 18, 2016, Statistics Canada determined and published the annual percentage increase for the 12-month period of November 1, 2015 to October 31, 2016, which was 1.5 percent;
- (j) Contrary to the terms of the Plan, the Administrator did not use the published Statistics Canada CPI percentage increase. Instead, the Administrator incorrectly calculated the annual increase of CPI using a method which differed from the method used by Statistics Canada and which yielded a figure that differed from the Statistics Canada published annual increase of the CPI;
- (k) Class members have suffered damages as a result of the Defendants' actions;
- (l) The Participating Employers failed to ensure that the indexation rate was correctly calculated by the Administrator and failed to ensure the correct amount of pension benefits were paid to the Class Members pursuant to the Plan;
- (m) The Defendants breached the provisions of the Plan as set out above;

Breach of Trust and Fiduciary Duties

- (n) At all material times, the pension funds were to be held in trust by the Administrator in favour of the Class members;
- (o) Pursuant to the Plan, the declaration of trust, relevant jurisprudence, and the *Pension Benefits Standards Act*, 1985, R.S.C. 1985, c. 32 (2nd Supp.), s. 8, the Administrator administers the pension funds as a fiduciary and a trustee;
- (p) The Administrator's actions, as set out above, are contrary to the Plan terms and constitute a breach of trust and breach of fiduciary duty;

Damages

- (q) Damages sustained by the Class can be assessed on an aggregate basis using the methods set out in the expert report of Cameron McNeill;
- (r) There is no genuine issue requiring a trial on the Common Issues;
- (s) *Class Proceedings Act*, 1992, S.O. 1992, c. 6;
- (t) *Rules of Civil Procedure*, RRO 1990, Reg 194;
- (u) *Pension Benefits Standards Act*, 1985, RSC 1985, c 32 (2nd Supp);
- (v) *Pension Benefits Standards Regulations*, 1985, SOR/87-19; and,
- (w) such other grounds as counsel may advise and this Honourable Court may permit.

THE FOLLOWING DOCUMENTARY EVIDENCE will be used at the hearing of the motion:

- (a) the pleadings filed herein;
- (b) the affidavit of Philip Cross sworn July 20, 2018;

- (c) the affidavit of Cameron McNeill sworn July 24, 2018;
- (d) the affidavit of Leslie Austin sworn July 25, 2018; and
- (e) the affidavit of Jasmine Randhawa sworn July 25, 2018.

July 26, 2018

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**ONTARIO
SUPERIOR COURT OF JUSTICE**

Proceeding commenced at Toronto

**NOTICE OF MOTION
(Summary Judgment Motion)**

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Court File No.: CV-18-590105-00CP

**ONTARIO
SUPERIOR COURT OF JUSTICE**

BETWEEN:

LESLIE AUSTIN

Plaintiff

- and -

**BELL CANADA, BELL MEDIA INC.,
EXPERTECH NETWORK INSTALLATION INC., and BELL MOBILITY INC.**
Defendants

Proceeding under the *Class Proceedings Act, 1992*

**AFFIDAVIT OF LESLIE AUSTIN
(Sworn July 25th, 2018)**

I, Leslie Austin, of the City of London, in the Province of Ontario MAKE OATH
AND SAY:

1. I am the proposed representative plaintiff in the within action and a member of the Bell Canada Pension Plan (the "**Plan**") and as such have knowledge of the matters hereinafter deposed, except where stated to be on information and belief, in which case I disclose the source of my information. I believe these facts to be true.

A. Background and Experiences with Bell Canada

2. In 1976, I commenced my employment with Newfoundland Telephone Co. in St. John's Newfoundland. In 1980, I transferred to Bell Canada Inc. at the 160 Elgin Street, Ottawa location. ^{M/S}

3. In 1981, I transferred to the Bell Canada Inc. 100 Dundas St., London location. In 1985, I transferred again to the Bell Canada Inc. training centre at Eglinton Avenue, Toronto.

4. I retired on September 30, 2012 and began to receive monthly defined pension payments under the Plan.
5. My monthly pension payments as of December 31, 2016 were \$2,418.72. My pension payment indexation in 2017 was \$24.19 bringing my monthly pension payment as of January 1, 2017 to \$2,442.91. Attached and marked as **Exhibit "A"** is a copy of a statement of my pension entitlement, printed on January 17, 2017.
6. Bell Canada stated in a document circulated to pensioners that it would only be providing a pension indexation percentage increase for 2017 of 1% and set out its method of calculation. Attached and marked as **Exhibit "B"** is a copy of the document titled "Bell Cost-of-living adjustments January 2017".
7. I disagreed with the Bell method of calculation of the indexation as I believed it was not consistent with the Plan text. On January 4, 2017, I wrote to Bell stating that the indexation percentage increase for 2017 should have been 2%, which in my case equates to \$48.36 a month. I sent additional emails on this issue to Bell on January 18, 2017 and January 23, 2017.
8. On January 25, 2017, I received a response to my January 23, 2017 email in which the Administrator advised that the 2017 1% cost-of-living adjustment would remain unchanged. I followed up on this issue over the course of several months until September 2017. Attached and marked as **Exhibit "C"** is a copy of my correspondence with Bell on this issue.

B. The Nature of this Action

9. This action is brought on behalf of:

all persons, wherever resident, who are or were members under the Bell Canada Pension Plan, or otherwise entitled to benefits under the Plan, and who were entitled to receive indexed pension payments pursuant to section 8.7 of the Plan as of January 1, 2017, together with the spouses, estates, heirs, beneficiaries, and representatives of any of the above who has died.

10. The Statement of Claim in this action alleges that the defendants breached their contractual obligations, and breached trust and fiduciary duties through the incorrect approach to indexation under the Bell Canada Pension Plan.

C. My Motivation in Joining this Action

11. I am willing to act as a representative plaintiff in this action to ensure these important issues are determined by the court, to promote access to justice for the other class members, and to bring about behaviour modification.

12. Brittany Tovee of Koskie Minsky LLP has advised me, and I believe that litigating a lawsuit of this nature against the defendant will be very expensive. Ms. Tovee has advised me that there will likely be substantial expert costs in litigating this action. I understand that the cost of legal fees and disbursements to litigate this matter through to trial will likely exceed the amount of any one individual claim.

D. I am Prepared to Act as Representative Plaintiff in this Action

13. I am prepared to act as representative plaintiff in this class action. I understand that as representative plaintiff, I would be obliged to direct this litigation, give instructions to my lawyers and to act in the best interests of the class members. For example, I understand that any settlement discussions with the defendants cannot relate only to my legal issues, but must relate to the claims of the class members as a whole.

14. I understand the major steps of a class proceeding to include:

- (a) preparing and serving a statement of claim, which has already been done;
- (b) a motion for certification, which I understand involves the court's consideration of whether this action is appropriate to proceed as a class action. I also understand there will be cross-examinations for this motion and that my ability to fairly and adequately represent the class will be in issue;

- (c) if the action is certified, there would be notice to the class of the certification and the right to opt-out (i.e. a chance for class members not to participate in the class action);
- (d) the disclosure and exchange of relevant documents;
- (e) examinations for discovery, where the defendant can examine me about my claim and those of the class and our counsel can examine the defendants' representatives;
- (f) a pre-trial conference where a judge can help the parties towards a settlement of the case;
- (g) a trial of the common issues (i.e. a trial that only deals with the certified common issues as opposed to the issues of the plaintiff and other class members);
- (h) notice to the class if individual hearings or participation is required;
- (i) the determination of individual issues, if required;
- (j) the distribution of proceeds (if any) of a money award by judgment or settlement;
- (k) appeals, which might include appeals from the certification motion, other motions, or the trial of the common issues; and
- (l) settlement discussions, which could happen at any time.

15. I understand that as representative plaintiff I would have, among others, the following responsibilities:

- (a) review and keep myself informed of the steps in this litigation;
- (b) familiarize myself with the issues to be decided at the common issues stage and other issues in the action;

- (c) help prepare the affidavits and other materials in support of certification, other motions and the materials that would be used at a common issues trial;
- (d) attend any cross-examination on my affidavit or otherwise;
- (e) attend the examinations for discovery;
- (f) assist in preparing and executing an affidavit of documents, which will list the relevant documents that I have in my possession, power or control;
- (g) attend at the common issues trial, providing any direction or assistance to class counsel and give evidence regarding the case;
- (h) express my views on any settlement offers that I receive or that I make on behalf of class members; and
- (i) assist in preparing materials in support of a court approving any settlement.

16. I am committed to actively directing this litigation and maximizing the recovery for the class. I have been advised by Ms. Tovee and accept that I owe a duty to all members of the proposed class to provide fair and adequate representation. I intend to work with counsel to obtain the best recovery for the whole class, consistent with good faith and meritorious advocacy.

17. I believe that I can fairly and adequately represent the interests of class members and I am committed to fulfilling my obligations as their representative.

E. Experiences with the Office of the Superintendent of Financial Institutions

18. Prior to the within certification motion, the defendants unsuccessfully sought to schedule a motion staying this class proceeding in favour of the jurisdiction of the Office of the Superintendent of Financial Institutions ("OSFI").

19. I was very concerned with the suggestion by the defendants that OSFI should determine the merits of this action. I have past experiences with a complaint to OSFI. In 2012, I contacted OSFI concerning the Bell mandatory retirement age and interaction with the Bell Canada Pension Plan. OSFI responded as follows:

Thank you for your email of April 16, 2012, concerning the Bell Canada Pension Plan.. [sic]

We appreciate you bringing your concerns to our attention, and have forwarded your correspondence to the appropriate area within OSFI for its review and action, as appropriate. However, due to confidentiality requirements contained in the Office of the Superintendent of Financial Institutions Act, we will not be able to get back to you with any information in this regard.

Attached and marked as **Exhibit "D"** is a copy of the email exchange between myself and OSFI representatives dated February 20, 2012 to April 25, 2012.

20. I never received any further follow up or response. Based on my experience with OSFI, I have significant concerns about the OSFI process. In particular, I am concerned about the lack of communication and the lack of transparency in the OSFI process.

21. This lack of transparency is confirmed in the OSFI website, in the FAQ section which provides as follows:

Q. Will OSFI inform me of what is happening with my complaint?

A. Due to a confidentiality requirement in the OSFI Act, we are not able to report back to you with any information on the progress or outcome of our work

Attached hereto and marked as **Exhibit "E"** is a copy of the OSFI website page titled "Frequently Asked Questions" retrieved from <<http://www.osfi-bsif.gc.ca/Eng/osfi-bsif/faq/Pages/fi-if.aspx>> on July 9, 2018.

22. Furthermore, I understand that the process for an OSFI complaint will differ considerably than proceeding with an action in the courts, or even a complaint to other regulatory bodies like the Financial Services Commission of Ontario which has a

separate tribunal to hear complaints. I understand that at OSFI, there will not be a trial or oral hearing, and there is no separate tribunal to determine the issue. I understand that I may not receive the submissions of the other parties, and may not have an opportunity to respond, or for my lawyers to cross-examine. In addition, I understand that any decision of OSFI is discretionary and if it decides not to take action then there is no right of appeal. This causes me serious concern as I want to ensure that I will have the right to participate and have the procedural protections available from the court process.

23. I directed Class Counsel to commence this proceeding by way of class action. I believe that the Class and I will have better access to justice by way of class action than through an OSFI proceeding.

F. Litigation Plan

24. I have reviewed a copy of the litigation plan. I understand that the litigation plan provides for notice to the class members if the action is certified. I do not have the expertise to evaluate the legal aspects of the plan, but my lawyers have formulated this plan and I understand from them that it is designed to provide a workable method of determining the issues in this action. Attached hereto and marked as **Exhibit "F"** is a copy of the litigation plan prepared by my lawyers.

25. I do not have a conflict of interest with the proposed class members with respect to any of the common issues in this case.

26. I make this Affidavit in support of the within motions for certification and summary judgment and for no other purpose.

SWORN BEFORE ME at the City of London,
in the Province of Ontario this 25th day of
July, 2018.


A Commissioner for taking Affidavits (or as may be)



Leslie Austin

*THIS IS EXHIBIT "A" REFERRED TO IN THE
AFFIDAVIT OF LESLIE AUSTIN
SWORN BEFORE ME, THIS 25TH DAY OF JULY, 2018*



A COMMISSIONER FOR TAKING AFFIDAVITS, ETC.

Benefits / Avantages

BCE Group of Companies

**LESLIE J AUSTIN
26-14 CADEAU TERR.
LONDON (ON) N6K 4X5**

In line with its objective of communicating clear, complete and accurate information, the Benefits Administrator is pleased to provide you with this statement that includes information on the benefits you are currently eligible for, as a retiree of Bell Canada. Your statement is based on the following data from our records. If you notice any discrepancy, please contact the Benefits Administrator. You should keep this document as a reference for your files.

Personal information

Retiree

Employee number	2026992
Date of birth	1947-05-10
Date of retirement	2012-09-30

Eligible spouse

(for pension plan purposes only)

Name	TRUDY AUSTIN
Date of birth	1950-02-12

Your marital status is established as of your date of retirement.

In brief as of January 1, 2017

Pension Plan

Monthly pension	\$2,442.91
Form of pension payment	Lifetime level pension with a surviving spouse pension at 60%

Life Insurance

Basic Group Life Plan	\$48,000
	<i>subject to further reduction(s)</i>

Other Benefits

Employee Discount Plan

35% reduction applies to virtually all account charges on the full suite of Bell residential products and services

Pension Plan

Monthly pension amount

Upon retirement, you chose a lifetime level pension from the Bell Canada Pension Plan. This means that you receive constant pension payments, every month for life.

Your monthly pension amounts* are:

As at December 31, 2016	\$2,418.72
2017 Indexation	\$24.19
As at January 1, 2017	\$2,442.91

* Excludes any deductions that may be made on your pension payment, such as income taxes.

2017 Indexation

The Pension Plan provides an annual automatic indexation of your pension based on the change in the Consumer Price Index (CPI) over the 12-month period ending October 31 immediately preceding the date of pension increase. For retirees age 65 or over, the applicable pension indexation rate is equal to the greater of:

- 100% of the change in the CPI, rounded to the nearest whole number, to a maximum of 2%, or
- 60% of the change in the CPI, to a maximum of 4%

If the change in the CPI is negative for a given year, your pension will not be reduced.

CPI change over the 12-month period ending October 31, 2016	1.49%
2017 Indexation - effective January 1, 2017	1.0%

It should be noted that the method used to calculate the percentage of indexation varies from plan to plan. Bell Canada Pension Plan pensions are indexed based on the provisions of the pension plan as described above. For example, indexing for government pensions (CPP/QPP) is based on a different methodology, using the **average** of the CPI for each month of the 12-month period ending on October 31 of the preceding year.

Upon death

The pension benefits payable upon death are based on the form of pension payment established at retirement. The current form of pension payment is a **lifetime level pension with a surviving spouse pension at 60%**.

The form of pension payment chosen upon retirement is irrevocable, meaning that the form cannot be modified once pension payments have started. However, since January 1, 2004, upon a judgement or separation agreement during retirement and your former spouse waiving his/her entitlement to a survivor pension, all your future payments would be reinstated (increased) to the pension amount as if the survivor pension option had been waived at retirement.

If you die before your eligible spouse

Upon your death, 60% of your level pension will be paid to TRUDY AUSTIN, your eligible spouse at retirement. Therefore, in the event of your death before January 1, 2018, your eligible spouse would receive a monthly pension of **\$1,465.75** for the rest of his/her life. This pension would be indexed annually.

If your eligible spouse dies before you

Upon retirement, your pension was reduced to take into account the value of the benefits provided to your spouse upon your death. In the event that your spouse predeceases you, all your future payments would be reinstated (increased) to the pension amount as if the survivor pension option had been waived at retirement. In the event that your spouse's death occurs before January 1, 2018, your pension would be increased to **\$2,657.93**.

Note that it is **your responsibility** to advise the Benefits Administrator of your spouse's death as soon as possible.

Plan information

Province and registration number:	Federal - 55077
Applicable legislation:	Federal
Solvency ratio at December 31, 2015:	93.8%

Financial Situation of the Plan

Pension legislation requires that an annual actuarial valuation of the Plan must be conducted when the solvency ratio (assets over liabilities, calculated as if the Plan had been terminated) is less than 1.20.

According to the latest actuarial valuation performed as at December 31, 2015, the solvency ratio of the Plan was 93.8% and the funding ratio (assets over liabilities, calculated on a going-concern basis) was 107.1%. A solvency ratio of less than 100% means that if the Plan had been terminated on December 31, 2015, the Pension Fund would have been insufficient to pay for all of the Plan's commitments at that date. However, in accordance with pension legislation, the participating companies are contributing the necessary funds to pay all benefit payments. As at December 31, 2015, the Plan had a surplus of \$977,600,000 on a going-concern basis and a deficit of \$997,900,000 on a Plan termination basis.

Funding the Plan

Bell Canada and other participating companies under the Plan contribute all amounts necessary to provide for the promised benefits under the DB and the DC arrangements and to pay all administrative fees, including special payments to liquidate the solvency deficit, as required by the Pension Benefits Standards Act of 1985, an act covering federally regulated pension plans.

For the year ended December 31, 2015, the participating companies contributed \$462,600,000 to the Plan, including voluntary contributions of \$218,600,000 in excess of the minimum amortization payments and other required payments for December 30, 2015. Contributions were also made by Plan members who participate under the DC arrangement of the Plan.

Individual DC accounts are invested in the different investment options offered in accordance with each member's allocation. Under the DB arrangement, all funds are held in a trust fund by RBC Investor and Treasury Services and investments are managed by Bimcor Inc. in accordance with applicable legislation.

The Plan Administrator reserves the right to amend, modify or even terminate the Plan at any time or to take contribution holidays when conditions permit. If it ever becomes necessary to terminate the Plan, the funds must be used to pay accrued benefits. When the Plan's liabilities have been legally paid off, any balance remaining reverts to Bell Canada.

Investment policy

The administrator has established a statement of investment policies and procedures. This statement provides guidelines for the fund manager(s) as to the level of risk that is consistent with the Plan's investment objectives. A significant component of it is the asset mix.

The target asset mix is provided for information purposes.

	Actual Allocation	Target Allocation
Low Risk Assets	64.0%	66.5%
Real Return Bonds		9.3%
Nominal Bonds		52.2%
Infrastructure Equity		2.6%
Real Estate		0.2%
Money Market		2.2%
Return Generating Assets	36.0%	33.5%
Canadian Equities		3.9%
Non-canadian Equities		16.4%
Dividend Equities		3.6%
Private Equities		4.2%
Hedge Funds		3.5%
Other		1.9%
Total		100%

To provide an overview of the Plan's investments, here are the top 10 holdings in the portfolio.

Top 10 Holdings	Weight
Government of Canada - 4.00%, June 1, 2041	2.16%
Government of Canada - 5.00%, June 1, 2037	2.02%
Government of Canada - 5.75%, June 1, 2033	1.97%
Government of Canada - 3.50%, December 1, 2045	1.88%
Government of Canada - 4.25%, December 1, 2021	1.79%
Government of Canada - 4.00%, December 1, 2031	1.68%
Government of Canada - 5.75%, June 1, 2029	1.53%
Government of Canada - 1.50%, December 1, 2044	1.42%
Province of Ontario - 3.45%, June 2, 2045	1.39%
Government of Canada - 2.00%, December 1, 2041	1.33%

Life Insurance

Basic Group Life Plan

You are covered under the Basic Group Life Option A. Upon your death, your life insurance coverage of \$48,000 will be paid as a tax free lump sum to your designated beneficiaries or your estate, if there is no beneficiary.

Other Benefits

You are eligible for the Employee Discount Plan. This means you benefit from 35% off the cost of Bell residential products and services – Bell Home Phone, Bell Internet, Bell Satellite and Fibe TV. Buying from Bell is an easy decision. You're getting the best communications services at a great price. And you're helping support the continued success of a great Canadian company that you played a key role in building.

Who Do I Call?

To change your designated beneficiaries, notify a change of address or for any question about your benefits, do not hesitate to:

- visit the Benefits at retirement Web site at www.benefits-avantages.hroffice.com;
- contact the Benefits Administrator from 7:30 a.m. to 5:00 p.m., Eastern Standard Time, at **1 888 400-0661**.

Benefits Administrator
1, Carrefour Alexander-Graham-Bell, Local DB1-20
Verdun (QC) H3E 3B3

*THIS IS EXHIBIT "B" REFERRED TO IN THE
AFFIDAVIT OF LESLIE AUSTIN
SWORN BEFORE ME, THIS 25th DAY OF JULY, 2018*



A COMMISSIONER FOR TAKING AFFIDAVITS, ETC.



Cost-of-living adjustments January 2017

Bell Canada Pension Plan (the "Plan") Indexation

The Plan provides for pension indexing each January 1 to partially compensate for cost-of-living increases. This formula takes into account the retiree's age on January 1 and the increase in the Consumer Price Index (CPI) over a 12-month period running from November 1 of one year to October 31 of the next.

How it works

Under age 65 = The increase in the CPI (rounded to the nearest whole number), up to a maximum of 2%

Age 65 and older = The greater of:

- 100% of the increase in the CPI (rounded to the nearest whole number), up to a maximum of 2% or
- 60% of the increase in the CPI (rounded to the nearest 2 decimal points), up to a maximum of 4%

In the year of retirement, the indexation rate applicable is prorated based on the number of months since the retirement date.

2017 Pension Indexation

As reported by Statistics Canada for the month of October each year: CPI for October 2016 = 129.1 (A)
CPI for October 2015 = 127.2 (B)

$$\begin{aligned} > \text{Increase in the CPI over the 12-month period} &= [(A) / (B)] - 1 \\ &= [129.1 / 127.2] - 1 \\ &= 0.014937 = 1.4937\% \end{aligned}$$

Based on the above Plan provisions, here is how the pension indexation is calculated for:

> Pensioners under age 65

$$\begin{aligned} &100\% \text{ of CPI increase, up to a max of } 2\% \text{ (rounded to the nearest whole number)} \\ &= 1.4937\% \text{ (rounded to the nearest whole number)} \\ &= 1\% \end{aligned}$$

> Pensioners aged 65 and older

The greater between (1) and (2) as follow:

- 100% of CPI increase up to a maximum of 2% (rounded to the nearest whole number) (1)
- 60% of CPI increase up to max of 4% (rounded to the nearest 2 decimal points) (2)

$$\begin{aligned} (1) &= 100\% \text{ of } 1.4937\% \text{ up to max of } 2\% \text{ (rounded to the nearest whole number)} \\ &= 1.4937\% \text{ (rounded to the nearest whole number)} \\ &= 1\% \end{aligned}$$

$$\begin{aligned} (2) &= 60\% \text{ of } 1.4937\% \text{ up to max of } 4\% \text{ (rounded to the nearest 2 decimal points)} \\ &= 0.89622\% \text{ (rounded to the nearest 2 decimal points)} \\ &= 0.90\% \end{aligned}$$

The greater between (1) and (2) is 1%.

The 2017 pension indexation is 1% for pensioners under age 65 and 1% for pensioners aged 65 and older.
The 2017 pension indexation will be reflected on your January pension payment.

*THIS IS EXHIBIT "C" REFERRED TO IN THE
AFFIDAVIT OF LESLIE AUSTIN
SWORN BEFORE ME, THIS 1ST DAY OF JULY, 2018*



A COMMISSIONER FOR TAKING AFFIDAVITS, ETC.

11/21/2017

Bell 2017 PENSION INCREASE Printout

les.austin les.austin <les.austin@sympatico.ca>

1/4/2017, 3:23 PM

2017 PENSION INCREASE

To pension plan admIn <centre_spec@bell.ca>

There is only one input used to calculate the percentage increase in my Bell Canada Pension Plan payment.

Bell must use the the annual percentage increase of the Consumer Price Index as, determined by Statistics Canada, during the period of November 1 to October 31 immediately preceding the date of the pension increase: (paragraph 1.28 of pension plan text)

This year Statistics Canada announced that the Consumer Price Index (CPI) had risen 1.5% for year ending October 31. 2016.

According to plan text this number 1.5 had to be rounded to nearest whole number, by convention 1.5 is closer to 2 than 1.

As a result my pension should increase by 2%.

HOWEVER, it appears that Bell is not prepared to use the CPI .as determined by Statistics Canada. Statistics Canada determines the CPI rounded to one decimal place, whereas Bell prefers to calculate the CPI to two decimal places.which results in a CPI of 1.49%.

Bell's unique CPI results In a pension increase of 1% .

Would bell be willing to go back and reevaluate the use of 1.5% as opposed to 1.49%.

Look forward to receiving your reply.

Leslie Austin

519 472 3597

11/21/2017

Bell 2017 COLA for Bell retirees Printout

les.austin les.austin <les.austin@sympatico.ca>

1/18/2017, 1:31 PM

2017 COLA for Bell retirees

To employee.services <employee.services@bell.ca>

Our Bell Canada Pension Plan has a cost of living adjustment (COLA) clause that reads:

Paragraph 8.7

On every first day of January, the retirement benefits payable to a Member, the surviving Spouse or the Beneficiary under the DB Provisions shall be augmented by a percentage determined as follows:

- (i) If, on the date of increase, the Member has not reached 65 years of age, or would not have reached 65 years of age in the case of a surviving Spouse or Beneficiary, the Pension Index, limited to a maximum of 2% and calculated on a compounded basis.*
- (ii) If, on the date of increase, the Member has reached 65 years of age, or would have reached 65 years of age in the case of a surviving Spouse or Beneficiary, the percentage shall be the greater of:*
 - (a) 60% of the Pension Index, limited to a maximum of 4% and calculated on a compounded basis; or*
 - (b) the percentage determined under paragraph (i) above.*
- (iii) For the purpose of any increase applicable to a Member, the surviving Spouse or the Beneficiary within the first year of retirement, the applicable percentage shall be prorated, taking into account the number of full calendar months of retirement in the calendar year preceding the date of increase.*
- (iv) All percentage increases shall be rounded to the nearest 2 decimal points, except for the percentage increase under paragraph (i) above which shall be rounded to nearest whole number.*

The definition of "Pension Index" is found at paragraph 1.28 of Bell Canada Pension Plan and it reads as follows:

"Pension Index" means the annual percentage increase of the Consumer Price Index, as determined by Statistics Canada, during the period of November 1 to October 31 immediately preceding the date of pension increase. [emphasis added]

On November 18, Statistics Canada released the CPI data for the last twelve months. According to Statistics Canada, the CPI rose 1.5% between October 2015 and October 2016 for Canada as a whole. (<http://www.statcan.gc.ca/daily-quotidien/161118/dq161118a-eng.htm>)

Will you confirm that Bell uses the CPI as determined by Statistics Canada and that the CPI or Pension Index that will be used to determine this years COLA is 1.5%

Regards

Leslie Austin

11/21/2017

Bell RE_2017 Pension adjustment Printout

les.austin les.austin <les.austin@sympatico.ca>

1/25/2017, 1:50 PM

RE: 2017 Pension adjustment

To Guylaine Pomerleau <guylaine.pomerleau@bell.ca>

Guylaine,

Thank you for your reply.

The text of our pension plan states that the COLA is base on "the annual percentage increase of the Consumer Price Index, AS DETERMINED BY STATISTICS CANADA"

The calculation as determined by Statistics Canada is:

$((\text{Oct 2017 CPI}/\text{Oct 2016 CPI})-1)*100$ (rounded to one decimal place)= annual percentage increase in CPI

$((129.1/127.2)-1)*100=1.5\%$.

The plan text states that Bell must use the annual percentage increase of the CPI as determined by Statistics Canada . Statistics Canada always determines their CPI to one decimal place.

Can you point me to the pension plan text that would allow Bell to use another annual percentage increase of the CPI, other than the one "as determined by Statistics Canada"

Regards

Leslie Austin

----- Original Message -----

From: Pomerleau, Guylaine

Date: January 25, 2017 at 11:36 AM

Good day,

Here is the answer further to your email to Lucie Fournier regarding the pension indexation calculation for the Bell Canada Pension plan.

The Plan text requires that we use the Consumer Price Index from Statistics Canada. The Index value was 129.1 for October 2016 and 127.2 for October 2015, which results in an annual increase of 1.4937%.

The Plan text then determines how this number is rounded to determine the applicable rate of increase. The text states that: All percentage increases shall be rounded to the nearest 2 decimal points, except for the final percentage increase which shall be rounded to the nearest whole number (the actual indexation rate applied).

Therefore, we need to start the rounding process with a number that goes out to at least 2 decimal points. Hence, the 1.49% rounds down to 1% as a whole number.

11/21/2017

Bell RE_ 2017 Pension adjustment Printout

Statistics Canada has chosen to display a percentage change in the Consumer Price Index on its website each month that has already been rounded to 1 decimal point, so for October they rounded 1.49% to 1.5%.

It is important to note that the pension indexation calculation has been done following the same steps and process as all other years and is consistent with the plan text.

Finally, you will find enclosed a description of the pension indexation calculations for the Bell Canada Pension Plan as of December 31, 2016.

Regards,

The pension team

De : les.austin les.austin [les.austin@sympatico.ca]
Envoyé : 23 janvier 2017 12:36
À : Fournier, Lucie
Objet : 2017 Pension adjustment

Lucie,

This year, 2017, the annual Bell pension adjustment is based on the "Pension Index" rounded to the nearest whole number to a maximum of 2%..

The "Pension Index" is defined as "the annual percentage increase of the Consumer Price Index, as determined by Statistics Canada, during the period of November 1 to October 31 immediately preceding the date of the pension increase.

On November 18, 2016 Statistics Canada released the year over year percentage increase in the Consumer Price Index for the period ending October 2016. Statistics Canada determined that based on an October 2015 CPI of 127.2 and an October 2016 CPI of 129.1 that the annual percentage increase of the CPI was 1.5%.

If Bell had accepted this determination made by Statistics Canada, the annual pension adjustment effective January 1, 2017 would be 2%.

In a document provided by Bell to the Bell Pensioners Group (BPG) and published on the BPG web site, Bell calculates the annual percentage increase to be 1.4937% and as result our annual percentage adjustment effective January 1, 2017 is 1%.

It appears that Bell deviated from the pension plan text by not accepting Statistics Canada determination that the annual percentage increase of the CPI was 1.5% and in turn by substituting Bell's own determination that the annual percentage increase of the CPI was 1.4937%.

Does your mandate as Director Benefits extend to Bell's Pension, if it does can you explain why Bell substituted Statistic Canada determination that that annual increase in the CPI rose 1.5% with Bell's own determination that the CPI rose 1.4937%.

Regards

Leslie Austin

26-14 Cadeau Terr.
London. On.
N6K 4X5
22 MAY 2017

Benefits Administrator
1 Carrefour Alexander-Graham-Bell
Local DB1-20
Verdun. Quebec
H3E 3B3

Bell Canada's Pension Plan has an annual Cost of Living Adjustment (COLA) clause that reads as follows:

On every first day of January, the retirement benefits payable to a Member, the surviving Spouse or the Beneficiary under the DB Provisions shall be augmented by a percentage determined as follows:

- (i) if, on the date of increase, the Member has not reached 65 years of age, or would not have reached 65 years of age in the case of a surviving Spouse or Beneficiary, the Pension Index, limited to a maximum of 2% and calculated on a compounded basis.*
- (ii) if, on the date of increase, the Member has reached 65 years of age, or would have reached 65 years of age in the case of a surviving Spouse or Beneficiary, the percentage shall be the greater of :
 - (a) 60% of the Pension Index, limited to a maximum of 4% and calculated on a compounded basis: or*
 - (b) the percentage determined under paragraph (i) above.**
- (iii) For the purpose of any increase applicable to a Member, the surviving Spouse or the Beneficiary within the first year of retirement, the applicable percentage shall be prorated, taking into account the number of full calendar months of retirement in the calendar year preceding the date of increase.*
- (iv) All percentage increases shall be rounded to the nearest 2 decimal points, except for the percentage increase under paragraph (i) above which shall be rounded to nearest whole number.*

The definition of "Pension Index" reads as follows:

"Pension Index" means the annual percentage increase of the Consumer Price Index, as determined by Statistics Canada, during the period of November 1 to October 31 immediately preceding the date of pension increase.[emphasis added]

For retirees age 65 and over, the applicable pension indexation rate should be equal to:

The "Pension Index", rounded to the nearest whole number, to a maximum of 2%. (Combination of paragraphs (i) and (iv) found above).

When you replace the term "Pension Index" with its definition, found at paragraph 1.28 of the Pension Plan, you have the following:

For retirees age 65 and over, the applicable pension indexation rate should be equal to:

The annual percentage increase of the Consumer Price Index, as determined by Statistics Canada, during the period of November 1 to October 31 immediately preceding the date if pension increase, rounded to the nearest whole number, to a maximum of 2%.

In my annual Pension statement, from the Benefits Administrator, under the heading 2017 indexation it states:

"The Pension Plan provides an annual automatic indexation of your pension based on the change in the Consumer Price Index (CPI) over the 12 month period ending October 31 immediately preceding the date of pension increase."

This statement is not accurate. After (CPI), it is missing the statement "as determined by Statistics Canada" it should read:

"The Pension Plan provides an annual automatic indexation of your pension based on the change in the Consumer Price Index (CPI), as determined by Statistics Canada, over the 12 month period ending October 31 immediately preceding the date of pension increase."

On November 18, 2016 Statistics Canada determined that the CPI change, over the 12 month period ending October 31, 2016 to be 1.5%. If Bell had accepted the CPI change as determined by Statistics Canada the COLA for retirees would have been 2%.

However Bell does not accept the Statistics Canada determination, rather they calculate the change in CPI over the same period to be 1.49% resulting in a COLA of 1%.

Statistics Canada determines all CPI data to one decimal place and as the Bell pension Plan states that our COLA is based "on the change in Consumer Price Index, "as determined by Statistics Canada" Bell must also round 1.49% to 1.5% to comply with the explicit wording in the Pension Plan text.

Will Bell increase my 2017 COLA from \$24.19 per month to \$48.36 per month? Or in the alternative will Bell explain why it is not complying with the definition of "Pension Index" that states:

"Pension Index" means the annual percentage increase of the Consumer Price Index, as determined by Statistics Canada, during the period of November 1 to October 31 immediately preceding the date if pension increase.[emphasis added]

Sincerely

Leslie J Austin
2026992

Benefits / Avantages

July 27, 2017

Leslie Austin
26-14 Cadeau Terr.
London, ON N6K 4X5

SUBJECT: Bell Canada Pension Plan

Dear Leslie Austin,

This is further to your letter dated May 22, 2017, regarding your Bell Canada Pension Plan.

Statistics Canada determines the Consumer Price Index (CPI) on a monthly basis. The Pension Index, as defined in the Plan Text regulations, is the annual increase of the CPI during the period of November 1 to October 31 immediately preceding the date of pension increase.

The Pension Index used to calculate the Cost of Living Adjustment (COLA) in 2017 has been determined using the ratio of the monthly CPI, as determined by Statistics Canada, of October 2016 and October 2015:

$$\frac{\text{CPI October 2016}^*}{\text{CPI October 2015}^*} - 1 = \frac{129.1}{127.2} - 1 = 1.4937\%$$

* As determined by Statistics Canada.

In your case, this value is rounded to the nearest whole number, resulting in a Pension Index of 1% for 2017. As a result, your Cost of Living Adjustment will remain unchanged.

Please note that even though this year in particular, it may seem that this rounding method is penalizing for the retiree, for any ratio equal or larger to 1.50%, the result would be the opposite (the rounding will be to the advantage to the retiree).

Should you have any questions, please feel free to contact the Benefits Administrator between 8:30 a.m. and 6:00 p.m., Atlantic Time (AT) at 1-888-400-0661.

Yours truly,

Benefits Administrator
1, Carrefour Alexander-Graham-Bell (Local DB1-20)
Verdun, Québec H3E 3B3

Brittany Tovee

From: les.austin les.austin <les.austin@sympatico.ca>
Sent: May-11-18 5:25 PM
To: Brittany Tovee
Subject: Fwd: FW: Pension enquiry
Attachments: FW 2017 Pension adjustment

----- Original Message -----

From: Benefits - Avantages <Benefits_Avantages.sociaux@bell.ca>
To: "les.austin@sympatico.ca" <les.austin@sympatico.ca>
Cc: CTRSPEC <centre_spec@bell.ca>
Date: August 15, 2017 at 12:20 PM
Subject: FW: Pension enquiry

Hello Mr. Austin,

You already received a detailed and satisfactory written answer in January 2017 explaining how the 2017 Bell indexation is calculated as defined in the Pension Plan text. For your reference, please find attached the email dated on January 25, 2017 sent from the Pension team.

This will be our last correspondence on that matter.

Regards,

Amelie

Benefits - Avantages

From: les.austin les.austin [<mailto:les.austin@sympatico.ca>]
Sent: Friday, July 28, 2017 11:16 PM
To: CTRSPEC
Subject: RE: Pension enquiry

I did they told me they had forwarded to pension group May 30, 2017.

----- Original Message -----
From: CTRSPEC <centre_spec@bell.ca>
Date: July 28, 2017 at 3:17 PM

Hi Leslie,

For follow up on your letter please reach out to the Benefits Administrator at 1-888-391-0005.

Regards,

Jess

From: les.austin les.austin [<mailto:les.austin@sympatico.ca>]
Sent: Friday, July 28, 2017 4:06 PM
To: CTRSPEC
Subject: Pension enquiry

Can you tell me when I might expect a reply to the letter that I sent to Benefit Administrator dated May 22 2017.

Regards

Leslie Austin

2026992

Le présent courriel et toutes les pièces jointes contiennent de l'information privée, exclusive, privilégiée et/ou confidentielle s'adressant uniquement au destinataire. Toute utilisation, copie ou distribution non autorisée du contenu de ce courriel est strictement interdite. Si vous n'êtes pas le destinataire de ce message et que vous l'avez reçu par erreur, veuillez le supprimer et en informer immédiatement l'expéditeur.

This e-mail communication, including all attachments, may contain private, proprietary, privileged and/or confidential information and is intended only for the person to whom it is addressed. Any unauthorized use, copying or distribution of the contents of this e-mail is strictly prohibited. If you are not the intended recipient of this e-mail, and have received it in error, please delete it and notify the sender immediately.

11/21/2017

Bell Printout

les.austin les.austin <les.austin@sympatico.ca>

9/18/2017, 6:05 PM

To: CTRSPEC <centre_spec@bell.ca> * employee.services <employee.services@bell.ca>

Benefits Administrator

Employees' Benefits Committee

In a letter dated June 27, 2017, sent to me by Bell's Benefit Administrator, the Benefit Administrator states:

"The Pension Index, as defined in the Plan Text Regulations, is the annual increase of the CPI during the period of November 1 to October 31 immediately preceding the date of pension increase"

Will you please send me a copy of the Plan Text Regulations, if that is not possible can you send me a copy of any documentation that would confirm the definition of the term "Pension Index"

The reason I am asking is, if the above definition is accurate and the "pension Index" is based simply on the annual increase of the CPI then the "Pension Index" for 2017 should be the annual increase of the CPI between October 2015 and October 2016, that is the difference between 129.1 and 127.2 or 1.9 and when 1.9 is rounded to the nearest whole number our COLA for 2017 would have been 2%.

I look forward to receiving your reply.

Regards

Leslie Austin (2026992)

*THIS IS EXHIBIT "D" REFERRED TO IN THE
AFFIDAVIT OF LESLIE AUSTIN
SWORN BEFORE ME, THIS 15TH DAY OF JULY, 2018*



A COMMISSIONER FOR TAKING AFFIDAVITS, ETC.

Brittany Tovee

From: les.austin les.austin <les.austin@sympatico.ca>
Sent: April-18-18 5:44 PM
To: Jonathan Ptak; baer
Subject: Fwd: 9987_Austin, Leslie_Bell Canada's Mandatory retirement policy

----- Original Message -----

From: Information <Information@osfi-bsif.gc.ca>
To: leslie austin <les.austin@sympatico.ca>
Date: April 25, 2012 at 11:02 AM
Subject: 9987_Austin, Leslie_Bell Canada's Mandatory retirement policy

Dear Leslie,

Thank you for your email of April 16, 2012, concerning the Bell Canada Pension Plan..

We appreciate you bringing your concerns to our attention, and have forwarded your correspondence to the appropriate area within OSFI for its review and action, as appropriate. However, due to confidentiality requirements contained in the *Office of the Superintendent of Financial Institutions Act*, we will not be able to get back to you with any information in this regard.

Again, thank you for taking the time to write and for sharing your comments with us.

Sincerely,

Melanie Carriere

Correspondence Officer / Agente de la correspondance

Communications and Consultations / Communications et consultations

Office of the Superintendent of Financial Institutions / Bureau du surintendant des institutions financières

255 Albert St. Ottawa ON K1A 0H2 / 255, rue Albert, Ottawa (Ontario) K1A 0H2

Telephone / Téléphone 1-800-385-8647

Facsimile / Télécopieur 613-990-5591

Government of Canada / Gouvernement du Canada

From: leslie austin [mailto:les.austin@sympatico.ca]
Sent: April-16-12 2:04 PM
To: Information
Subject: 9987_Austin, Leslie_Bell Canada's Mandatory retirement policy

I am a Bell Canada employee, and a member of the Bell Canada Pension Plan. This plan is registered with the Office of the Superintendent Financial of Institutions (OSFI) under plan No.55077.

Bell Canada is the pension plan sponsor and is also the pension plan administrator.

In Sept 2011, I requested and received a copy of the Bell Canada Pension Plan text from the pension plan administrator. This text contained provisions detailing Bell's long standing policy of mandatory retirement at age 65.

In January 2012, in response to a complaint that I had filed with the Canadian Human Rights Commission (CHRC), I was advised by the CHRC that Bell had abolished its mandatory retirement at age 65 policy as of April 1, 2010.

After receiving this information from the CHRC, I contacted Bell, and they confirmed that they no longer had a mandatory retirement policy.

Bell agreed to forward to me a copy of the Pension Plan Amendment that ended mandatory retirement. This amendment was not dated. However it was effective March 11, 2010.

Bell Canada has acknowledged that to date, the contents of this amendment have not been communicated to plan members, other than "active" members who are within 6 months of age 65.

Based on the information that I have provided above and the e-mails attached below, would the OSFI originate an investigation to ascertain if Bell Canada has breached Section 8 and 23 of the Pension Benefit Standard Act (PBSA) more specifically:

- [1] Did Bell breach the PBSA by not informing plan members within 60 days of amending the pension plan?
- [2] Did Bell breach the PBSA by providing me, in September 2011, with a copy of the pension plan that was not current?

I look forward to receiving your reply.

Regards

From: lucie.fournier@bell.ca
To: les.austin@sympatico.ca
Date: Wed, 7 Mar 2012 14:03:54 -0500
Subject: RE: Mandatory retirement policy

Hello,

There was no communication to all employees. However, when an active employee is 6 months away from age 65, he receives information on the applicable working conditions should he continue working after age 65.

Lucie

From: leslie austin [mailto:les.austin@sympatico.ca]
Sent: March 7, 2012 10:58 AM
To: Fournier, Lucie (BCE1136)
Subject: RE: Mandatory retirement policy

Goodmorning Lucie,

Can you tell me when this amendment was released and how it was communicated to Plan members.

Regards

Leslie

From: lucie.fournier@bell.ca
To: les.austin@sympatico.ca
CC: lucie.dutil@bell.ca
Date: Tue, 6 Mar 2012 14:25:47 -0500
Subject: RE: Mandatory retirement policy

Dear Mr Austin,

The changes to the pension plan to reflect the possibility of an employee retiring after age 65 were effective in March 2010. Please find attached the amendment to the pension plan text providing for the latest date of retirement being no later than the end of the calendar year in which an employee attains 71 years of age.

With respect to the information on the benefits web site, the definition in the glossary section for the normal retirement age will be adjusted to no longer refer to mandatory retirement. This is an oversight on our part and should already have been modified. It will read as follows:

Normal Retirement Date: Last day of the month in which you reach age 65

Regards,

Bell

Lucie Fournier

Director - Benefits / Directeur - Avantages sociaux

BCE Inc.

(514) 870-0967

From: leslie austin [mailto:les.austin@sympatico.ca]
Sent: February 20, 2012 7:17 PM
To: Dutil, Lucie (BCE1345)
Cc: Fournier, Lucie (BCE1136)
Subject: Mandatory retirement policy

I am writing to you as you have identified yourself as the person in charge of ensuring that Bell's Pension plan is administered as per the plan provisions and in line with pension regulations.

In Sept 2011, the Director Benefits, Lucie Fournier sent me a copy of Bell Canada's Pension Plan text that included the following provision at paragraph 5.3:

"An Employee who terminates employment after having obtained age 55 may elect to retire on the last day of any month thereafter but no later than the date Pensionable Age is obtained....."

In Section 1 of the same Pension Plan text at paragraph 1.26, Pensionable Age is defined as meaning *"the last day of the month during which a member attains the age of 65"*.

Also, on Bell's Benefits web site you will find the following,

The Defined Benefit (DB) arrangement section of the Pension Plan module is your one-stop shop for information about the Defined Benefit arrangement of the company Pension Plan.

In the Glossary section you find the following definition of Normal Retirement Date,

"Last day of the month in which you reach age 65. Note that as per the mandatory retirement policy of the company, your employment cannot continue beyond that date"

On Friday January 30, 2012 I participated on a conference call with Lucie Fournier and Bell's Dr. Demers. On that call I was surprised to learn that Bell no longer had a mandatory retirement policy.

For full disclosure a few days after that conference call I received a Report from the Canadian Human Rights Commission (CHRC) that states Bell has abolished its mandatory retirement policy.

Given what I was told by Lucie Fournier and the statement in CHRC report, I am confident that Bell no longer has a mandatory retirement policy at age 65.

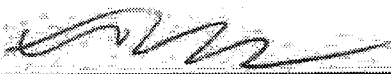
Can you tell me when the changes to the Pension Plan abolishing mandatory retirement were made and when will the Pension Plan text and the web site be updated to reflect Bell's new retirement policy.

Regards

Leslie Austin

2026992

*THIS IS EXHIBIT "E" REFERRED TO IN THE
AFFIDAVIT OF LESLIE AUSTIN
SWORN BEFORE ME, THIS 25TH DAY OF JULY, 2018*



A COMMISSIONER FOR TAKING AFFIDAVITS, ETC.



Office of the Superintendent of Financial Institutions

Home > OSFI > Frequently Asked Questions > Financial Institutions

Financial Institutions

Introduction

The Office of the Superintendent of Financial Institutions (OSFI) regulates and supervises all banks and federally incorporated or registered trust and loan companies in Canada, as well as insurance companies, cooperative credit associations and fraternal benefit societies.

Our mandate is to:

- Ensure that federally regulated financial institutions and pension plans are financially sound and meeting minimum plan funding requirements respectively, and are complying with their governing law and OSFI's requirements;
- Promptly take action or advise institutions to take prompt corrective action when material deficiencies have been identified;
- Build and maintain a regulatory framework that promotes the adoption of policies and procedures meant to control and manage risk;
- Monitor and evaluate system-wide or sectoral issues that may impact institutions negatively.

OSFI's legislation recognizes the need for institutions to compete effectively and take reasonable risks. Our legislation states that management, boards of directors and plan administrators are ultimately responsible and financial institutions and pension plans can fail.

Frequently Asked Questions

1. Q. Where can I obtain a listing of federally regulated financial institutions in Canada?
2. Q. Where can I obtain the history/incorporation documents for a federally registered financial institution?
3. Q. Is my financial institution safe? Can I obtain information from OSFI about its profitability and rating?
4. Q. How can I file a complaint against my financial institution?
5. Q. I have a complaint about my bank's brokerage services — can OSFI help me resolve it?
6. Q. How can I find out what happened to funds in an old (dormant) bank account?
7. Q. Is OSFI involved in deterring and detecting money laundering?
8. Q. What role do FINTRAC and OSFI play in these crime-detecting efforts?
9. Q. With so many reports of hacking and cyber-attacks in the news these days, can I count on OSFI to work with banks to protect deposit holders against such attacks?
10. Q. I have some concerns about my life, health or property and casualty insurance — can OSFI respond to my concerns?
11. Q. I have a question about the legality of a clause in the contract I have with my insurance company. Can OSFI help me with that?
12. Q. What about other insurance questions? Where do I turn if I need help with them?
13. Q. How does OSFI respond to whistleblowers — including allegations that a financial institution is engaging in misconduct or illegal business practices?
14. Q. Will OSFI inform me of what is happening with my complaint?

A. Due to a confidentiality requirement in the OSFI Act, we are not able to report back to you with any information on the progress or outcome of our work

Modified Date: 2015-09-14

*THIS IS EXHIBIT "F" REFERRED TO IN THE
AFFIDAVIT OF LESLIE AUSTIN
SWORN BEFORE ME, THIS 25TH DAY OF JULY, 2018*



A COMMISSIONER FOR TAKING AFFIDAVITS, ETC.

Court File No.: CV-18-59010500CP

**ONTARIO
SUPERIOR COURT OF JUSTICE**

BETWEEN:

LESLIE AUSTIN

Plaintiff

- and -

**BELL CANADA, BELL MEDIA INC.,
EXPERTECH NETWORK INSTALLATION INC., and BELL MOBILITY INC.**

Defendants

Proceeding under the *Class Proceedings Act, 1992*

LITIGATION PLAN

1. At the certification motion, the plaintiff will seek certification of some or all of the following common issues (“**Common Issues**”):

Breach of Contract

- (a) Did the Defendants owe a contractual obligation to provide pension indexation under the Plan? If so, what amount of pension indexation ought to have been applied and provided in respect of the year 2017?
- (b) Did the Defendants breach their contractual obligations?

Breach of Trust and Fiduciary Duty

- (c) Does Bell Canada, as administrator of the Plan, owe a duty as a trustee to the class?
- (d) If so, did Bell Canada breach its duty as a trustee?
- (e) Did Bell Canada, as administrator of the Plan, owe a fiduciary duty to the class?
- (f) If so, did Bell Canada breach its fiduciary duty?

Damages

- (g) If one or more of the above common issues are answered affirmatively, can the amount of damages payable by the Defendants be determined on an aggregate basis? If so, in what amount?

NOTIFICATION OF CERTIFICATION AND OPT OUT PROCEDURE

2. The plaintiff requests that the Court settle the form and content for notification of the certification of this action (the “**Notice of Certification**”), the timing and manner of providing Notice of Certification (“**Notice Program**”) and set out an opt-out date as being three (3) months following the date of the Certification Order.
3. The plaintiff requests that the defendants pay the costs of the Notice Program and the dissemination of the Notice of Certification.
4. The plaintiff will seek and order that the defendant send to Class Counsel and the Administrator, within sixty (60) days of the certification order, or the final determination of any appeals thereof (“**Certification Order**”):
 - (a) a list of all known members of the Class, including their last known addresses and contact information, including any e-mails and phone numbers, as available.
5. The plaintiff proposes that Notice of Certification be disseminated as follows:
 - (a) by mailing and emailing notice to all class members identified by the defendant;
 - (b) by an automated phone call notice to all class members identified by the defendant;
 - (c) by placing, within sixty (60) days of the certification order, or the final determination of any appeals thereof, newspaper notice(s) in 1/4 of a page size in one newspaper with national circulation;
 - (d) by posting a notice on class counsels’ and the Administrator’s (defined below) website;
 - (e) by posting a notice on the pension section of the website for the Defendant;
 - (f) by forwarding the notice to any class member who requests it;

- (g) by the Administrator establishing a toll-free telephone support line to provide assistance to class members, family, guardians or other persons who make inquiries on their own behalf or on behalf of class members; and
 - (h) by such other notice as counsel may request and the Court directs.
6. The plaintiff will ask the Court to approve an opt-out Form to be used by class members wishing to opt out of the class action, which will require the class member to provide sufficient information to establish their membership in the Class.
 7. The plaintiff will ask that the Court appoint an Administrator to organize and receive opt-out Forms or other written documentation from any class member opting-out of the class action. Only written elections to opt out will be accepted and must be delivered to the Administrator within the aforementioned deadline.
 8. Within sixty (60) days after the expiration of the opt-out period, the Administrator will deliver to the Court and the parties an affidavit listing the names of all persons who have opted out of the class action.

LITIGATION STEPS PRIOR TO THE DETERMINATION OF THE COMMON ISSUES

Pleadings and Production

9. The defendant shall serve a statement of defence within thirty (30) days from the date of Certification Order.
10. The plaintiff shall have thirty (30) days from service of the defendant's statement of defence to serve a reply, if any.
11. All pleadings in the action shall be served and filed within sixty (60) days from the Certification Order.
12. Within sixty (60) days from the Certification Order the parties shall agree upon a timetable for production of documents and examinations, to be approved by court order.
13. The plaintiff shall apply for such further directions as may be required.

Case Management Conference (“CMC”)

14. The plaintiff proposes that the CMC of this action be fixed for hearing within sixty (60) days of the Certification Order at a place to be fixed by the case management judge, to:
 - (a) address any issues related to a production and examination timetable between the parties; and
 - (b) set dates for further CMCs as necessary.

Common Issues Trial

15. The common issues trial will determine the Common Issues at a time and place fixed by the Court, in the City of Toronto.

LITIGATION STEPS FOLLOWING THE DETERMINATION OF COMMON ISSUES FAVOURABLE TO THE CLASS**Notice of Resolution of Common Issues**

16. The plaintiff will request that the Court settle the form and content for notification of the resolution of the Common Issues and the claims and individual issues processes (“**Notice of Resolution**”), the timing and manner of providing the Notice of Resolution (“**Resolution Notice Plan**”) and requiring class members to file claims (“**Claim Forms**”) by a fixed date with a person designated by the Court (the “**Administrator**”).

Valuation of Damages

17. Assuming that one or more of Common Issues are resolved in favour of the plaintiff, the plaintiff proposes the following methods for assessing and distributing damages for the class members as follows:
 - (a) aggregate damages to be distributed in a manner to be determined by the Court.
18. The plaintiff is seeking an aggregate assessment of monetary relief as a common issue. If aggregate damages are not awarded, or if the Court concludes that assessments are

required in addition to a determination of aggregate damages, it may still be necessary to establish a procedure in accordance with section 25 of the *Class Proceedings Act, 1992*, S.O. 1992, c. 6 ("*CPA*"), to determine the individual damages of Class Members, or any other individual issues as directed by the court.

19. Within ninety (90) days of the issuance of the judgment on the common issues, the parties will convene for argument relating to section 25 of the *CPA* to determine the appropriate process to determine the individual issues, if any.
20. At that hearing, both parties will be at liberty to make submissions regarding the methodology for resolving the remaining individual issues. Given the defendants have all of the records pertaining to the pension entitlements of each class member it should be unnecessary to require any testimony or records from the class members.

E. MISCELLANEOUS REQUIREMENTS OF THE LITIGATION PLAN

Communication with Class Members

21. The plaintiff has a toll-free line and communications centre to permit class members to contact class counsel, obtain answers to questions and to provide information necessary to assist in the advancement of the action.

Review of the Plan

22. This Litigation Plan may be reconsidered and revised under the continuing case-management authority of the Court after the determination of the common issues or upon application by the parties.
23. Class Counsel's legal fees are subject to court approval under the *CPA*.

Claims Administration

24. Plaintiff's counsel will propose that the Administrator provide the claims administration for any settlement achieved, for global damages distribution and individual damages determinations.
25. If a settlement is achieved and a settlement fund is provided, the Administrator will administer payments out of the fund to claimants based on the procedures set out above, with approval and/or modification by the Court.

Class Action Website

Class Counsel has a website page dedicated to this action and posts updates and important documents for the benefit of class members being kept up to date.

KM-3228579v1

Court File No.: CV-18-590105-00CP

**ONTARIO
SUPERIOR COURT OF JUSTICE**

Proceeding commenced at Toronto

**AFFIDAVIT OF LESLIE AUSTIN
(Sworn July 25th, 2018)**

KOSKIE MINSKY LLP
900-20 Queen St W
Toronto ON M5H 3R3

Mark Zigler LS#: 19757B
Tel: (416) 977-8353 / Fax: (416) 204-2877

Jonathan Ptak LS#: 45773F
Tel: (416) 595-2149 / Fax: (416) 204-2903

Brittany Tovee LS#: 71086L
Tel: (416) 595 2260 / Fax: (416) 977-3316

MCKENZIE LAKE LAWYERS LLP
1800-140 Fullarton St
London ON N6A 5P2

Matthew Baer LS#: 48227K
Tel: (519) 667-2646 / Fax: (519) 672-2674

Lawyers for the Plaintiff

Court File No.: CV-18-590105-00CP

**ONTARIO
SUPERIOR COURT OF JUSTICE**

BETWEEN:

LESLIE AUSTIN

Plaintiff

- and -

**BELL CANADA, BELL MEDIA INC.,
EXPERTECH NETWORK INSTALLATION INC., and BELL MOBILITY INC.**

Defendants

Proceeding under the *Class Proceedings Act, 1992*

**AFFIDAVIT OF JASMINE RANDHAWA
(Sworn July 25th, 2018)**

I, Jasmine Randhawa, of the City of Brampton, MAKE OATH AND SAY:

1. I am a legal assistant at Koskie Minsky LLP, one of the law firms in the counsel team for the proposed representative plaintiff in this action, and as such have knowledge of the matters hereinafter deposed.
2. The within action was commenced by way of Statement of Claim that was issued on January 16, 2018. Attached hereto and marked as **Exhibit "A"** is a copy of the Statement of Claim.
3. On December 20, 2017, Brittany Tovee, one of the lawyers at Koskie Minsky LLP, wrote to the Plan Administrator on behalf of Mr. Austin requesting certain information relating to the Plan. Attached and marked at **Exhibit "B"** is a copy of the December 20, 2017 letter.
4. The representative of the Plan Administrator, Eric Deslaurier, sent Ms. Tovee information relating to the plan on January 8, 2018 and January 12, 2018:

- (a) the Bell Canada Pension Plan Text, restated May 1, 2013 and amendments. Attached and marked at **Exhibit "C"** is a copy of the Bell Canada Pension Plan Text and amendments;
- (b) the Bell Canada Pension Plan Actuarial Valuation, as of December 31, 2016. Attached and marked at **Exhibit "D"** is a copy of the Bell Canada Pension Plan Text Actuarial Valuation; and
- (c) the Bell Canada Pension Plan Annual Information Return, reporting date December 31, 2016. Attached and marked at **Exhibit "E"** is a copy of the Bell Canada Pension Plan Annual Information Return.

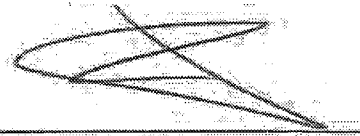
Attached and marked at **Exhibit "F"** is a copy of the email chain between Mr. Deslaurier and Ms. Tovee attaching the above documents.

5. Attached and marked at **Exhibit "G"** is a copy of the Statistics Canada publication entitled "Canadian Consumer Price Index Reference Paper" (Statistics Canada Catalogue No 62-553-X) retrieved from <<http://www.statcan.gc.ca/pub/62-553-x/62-553-x2015001-eng.pdf>> on July 19, 2018.

6. Attached and marked at **Exhibit "H"** is a copy of the Statistics Canada publication entitled "The Consumer Price Index October 2016" (Statistics Canada Catalogue No 62-001-X) retrieved from <<https://www150.statcan.gc.ca/n1/pub/62-001-x/62-001-x2016010-eng.pdf>> on July 19, 2018.

SWORN BEFORE ME at the City of Toronto,
this 25th day of July, 2018.


A Commissioner for taking Affidavits (or as may be)


Jasmine Randhawa


Brittany Tovee

LS# 71086L

*THIS IS EXHIBIT "A" REFERRED TO IN THE
AFFIDAVIT OF JASMINE RANDHAWA
SWORN BEFORE ME, THIS 25 DAY OF JULY, 2018*

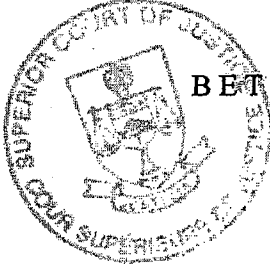


A COMMISSIONER FOR TAKING AFFIDAVITS, ETC.



Brittany Tovee

Court File No.:

W-18-590105
OJCP**ONTARIO
SUPERIOR COURT OF JUSTICE**

BETWEEN:

LESLIE AUSTIN

Plaintiff

- and -

**BELL CANADA, BELL MEDIA INC.,
EXPERTECH NETWORK INSTALLATION INC., and BELL MOBILITY INC.**
Defendants

Proceeding under the *Class Proceedings Act, 1992***STATEMENT OF CLAIM****TO THE DEFENDANT**

A LEGAL PROCEEDING HAS BEEN COMMENCED AGAINST YOU by the plaintiff. The claim made against you is set out in the following pages.

IF YOU WISH TO DEFEND THIS PROCEEDING, you or an Ontario lawyer acting for you must prepare a statement of defence in Form 18A prescribed by the *Rules of Civil Procedure*, serve it on the plaintiff's lawyer or, where the plaintiff does not have a lawyer, serve it on the plaintiff, and file it, with proof of service, in this court office, WITHIN TWENTY DAYS after this statement of claim is served on you, if you are served in Ontario.

If you are served in another province or territory of Canada or in the United States of America, the period for serving and filing your statement of defence is forty days. If you are served outside Canada and the United States of America, the period is sixty days.

Instead of serving and filing a statement of defence, you may serve and file a notice of intent to defend in Form 18B prescribed by the *Rules of Civil Procedure*. This will entitle you to ten more days within which to serve and file your statement of defence.

IF YOU FAIL TO DEFEND THIS PROCEEDING, JUDGMENT MAY BE GIVEN AGAINST YOU IN YOUR ABSENCE AND WITHOUT FURTHER NOTICE TO YOU. IF YOU WISH TO DEFEND THIS PROCEEDING BUT ARE UNABLE TO

- 2 -

PAY LEGAL FEES, LEGAL AID MAY BE AVAILABLE TO YOU BY CONTACTING A LOCAL LEGAL AID OFFICE.

IF YOU PAY THE PLAINTIFF'S CLAIM, and \$10,000 for costs, within the time for serving and filing your statement of defence, you may move to have this proceeding dismissed by the court. If you believe the amount claimed for costs is excessive, you may pay the plaintiff's claim and \$400.00 for costs and have the costs assessed by the court.

TAKE NOTICE: THIS ACTION WILL AUTOMATICALLY BE DISMISSED if it has not been set down for trial or terminated by any means within five years after the action was commenced unless otherwise ordered by the court.

Date: January 16, 2018

Issued by 

Local registrar

Address of court office 393 University Avenue
10th Floor
Toronto, ON M5G 1E6

TO: **Bell Canada**
1 Carrefour Alexander-Graham-Bell
A-7
Verdun QC H3E 3B3
Canada

Bell Media Inc.
299 Queen Street West
Toronto, ON M5V 2Z5
Canada

Expertech Network Installation Inc.
1 Carrefour Alexander-Graham-Bell
A-7
Verdun QC H3E 3B3
Canada

Bell Mobility Inc.
1 Carrefour Alexander-Graham-Bell
A-7
Verdun QC H3E 3B3
Canada

CLAIM

1. The plaintiff claims:
 - (a) an order certifying this action as a class proceeding and appointing the Plaintiff as representative plaintiff for the Class;
 - (b) a declaration that the Defendants improperly calculated the rate of indexation under the Bell Canada Pension Plan;
 - (c) a declaration that the Defendants breached their fiduciary and trust duties to the Plaintiff and Class Members;
 - (d) a declaration that the Defendants breached the terms of the contract set out in the Bell Canada Pension Plan;
 - (e) a declaration that the Defendants are liable to the plaintiff and Class Members for damages caused by the Defendants' breach of contract and breach of fiduciary and trust duties to the Plaintiff and Class Members;
 - (f) damages payable by the Defendants for breach of fiduciary and trust duties, and breach of contract in the amount of \$150,000,000 or such greater amount as may be determined by the court; or
 - (g) an order that the Defendants adjust the indexation amounts applicable to the class and pay the Class Members the amounts owing to date, plus interest, and an order that all future indexation or other increases be applied to the adjusted pension amounts such that the Class Members are put in the same position as if the 2017 indexation amounts were correctly calculated at first instance;
 - (h) costs of this action on a substantial indemnity basis or in an amount that provides full indemnity;

- 4 -

- (i) prejudgment and postjudgment interest pursuant to the *Courts of Justice Act*, R.S.O. 1995, c. C. 43, as amended;
- (j) pursuant to section 26 of the *Class Proceedings Act, 1992*, S.O. 1992, c. 6, the costs of notice and administering the plan of distribution of the recovery of this action, plus applicable taxes; and
- (k) such further and other relief as this Honourable Court may deem just.

A. OVERVIEW

2. This class proceeding arises out of the incorrect approach used by the Defendants to calculate the cost of living indexation pursuant to the Bell Canada Pension Plan (the "Plan"). As a result of the Defendants' incorrect approach, the Class Members have been short-changed their full pension entitlement under the Plan.

3. The Plan is a binding contract between the Defendants and the Class Members. The benefits under the Plan, including proper indexation of the Class Members' pensions, constituted deferred compensation earned by the Class Members in the course of their employment. Assets in the Plan's pension fund are held in trust by the Defendants as trustees and fiduciaries to the Plaintiff and Class in accordance with the Plan terms.

4. Indexation under the Plan provides necessary cost-of-living adjustments for Plan beneficiaries to ensure that their pension payments keep pace with inflation. Retirees are an extremely vulnerable group who are dependent on their pensions and the necessary inflation adjustments.

5. The method of calculation of indexation is set out in the Plan. The Plan provides that the indexation rate is to be based on "the annual percentage increase of the Consumer Price Index, as determined by Statistics Canada, during the period of November 1 to October 31 immediately preceding the date of the pension increase". Statistics Canada determines annual percentage increases which are published on its website. The Defendants failed to use the published Statistics Canada percentage

increase as required by the Plan. Instead, the Defendants incorrectly took a different approach and calculated a different figure which resulted in a lower annual increase to the detriment of the Class Members.

6. The Defendant's incorrect approach resulted in a difference of 1 percent of indexation for the 2017 year. This error has caused significant loss to the value of the pensions for the class as a whole.

B. THE DEFENDANTS

7. Bell Canada ("**Bell Canada**" or the "**Administrator-Defendant**") is a corporation incorporated pursuant to the laws of Canada that carries on business in communications and media. Bell Canada maintains its headquarters in Verdun, Quebec. Bell Canada is the administrator of the Plan.

8. Expertech Network Installation Inc. is a corporation incorporated pursuant to the laws of Canada. Expertech Network Installation Inc. maintains its headquarters in Verdun, Quebec at the same corporate address as Bell Canada.

9. Bell Mobility Inc. is a corporation incorporated pursuant to the laws of Canada. Bell Mobility Inc. maintains its headquarters in Verdun, Quebec at the same corporate address as Bell Canada.

10. Bell Media Inc. is a corporation incorporated pursuant to the laws of Canada. Bell Media Inc. maintains its offices in Toronto, Ontario.

11. Bell TV Inc. is a dissolved corporation which was incorporated pursuant to the laws of Canada. It maintained its headquarters in Montreal, Quebec and previously employed some of the Class Members. Upon dissolution in 2006 its pension obligations to the Class Members were assumed by Bell Canada which continues to contribute to the Plan on behalf of the former employees of Bell TV Inc.

12. Bell Canada, Bell Media Inc., Expertech Network Installation Inc., and Bell Mobility Inc. and Bell TV Inc. (collectively, the "**Employer-Defendants**"), are participating and contributing employer companies under the Plan.

C. THE PLAINTIFF

13. The plaintiff, Leslie Austin (“Austin” or the “Plaintiff”) resides in London, Ontario. In 1976, Mr. Austin commenced employment with Newfoundland Telephone Co., located in St. John's, Newfoundland. In 1980, Mr. Austin was transferred to Bell Canada at the 100 Elgin Street, Ottawa location.

14. Mr. Austin was transferred to the Bell Canada 100 Dundas St., London location in 1981. He was then transferred again to the Bell Canada training centre at Eglinton Avenue, Toronto in 1985.

15. Mr. Austin retired in September, 2012 and began to receive monthly defined benefit pension payments under the Plan.

D. THE CLASS

16. The Plaintiff brings this action under the *Class Proceedings Act, 1992*, S.O. 1992, c. 6 on behalf of:

all persons, wherever resident, who are or were members under the Bell Canada Pension Plan, or otherwise entitled to benefits under the Plan, and who were entitled to receive indexed pension payments pursuant to section 8.7 of the Plan as of January 1, 2017, together with the spouses, estates, heirs, beneficiaries, and representatives of any of the above who has died.

(“Class Members” or the “Class”)

E. THE PENSION PLAN**i. General**

17. Bell Canada and its related entities make up one of the largest Canadian communications organizations which has thousands of current and former Canadian employees.

18. The Plan constitutes a binding contract between the Class Members and the Defendants. In exchange for labour, the Class Members were compensated in part with the commitment to provide a guaranteed stream of income upon retirement (or other event triggering entitlement under the Plan) in the form of a monthly pension. The pension constituted deferred compensation for the Class Members' employment. The pension was to be provided in accordance with the terms of the Plan, administered by Bell Canada.

19. The Plan consists of a defined benefit component and a defined contribution component. The defined contribution component was introduced on January 1, 2005 and since that time new employees have been covered by the defined contribution component.

20. The Employer-Defendants participate in and make contributions to the Plan.

21. The pension fund of the Plan is a trust held by the Defendants for the benefit of Plan members.

22. The Plan is governed by the *Pension Benefits Standards Act, 1985* and its regulations. The Plan is subject to federal oversight and regulated by the Office of the Superintendent of Financial Institutions.

(1) Plan Membership Makeup

23. As of December 31, 2016, the Plan has 77,273 members that live throughout Canada and abroad.

24. Of the 77,273 Plan members:

(a) 30,717 are active (i.e. accruing benefits) members;

(b) 32,041 are retired members;

(c) 3,004 are receiving a survivor pensions;

- 8 -

- (d) 6,436 are terminated employees entitled to a deferred pension;
 - (e) 678 are members transferred out of the Plan for future benefit accrual with past service and liabilities remaining in the Plan; and
 - (f) 4,397 were former employees with defined contribution entitlements not yet transferred out of the Plan.
25. As of December 31, 2016, the makeup of Plan members was as follows:
- (a) Active Plan members accounted for 40 percent of the total membership, and retirees and survivor members receiving pension payments make by 45 percent of the total membership;
 - (b) The average age of Plan members was 43.9 years. The average age was 50.7 for the defined benefit component Plan members years and 40.2 years for the defined contribution component Plan members;
 - (c) The average length of service of plan members was 14.7 years. The average length of service for defined benefit Plan members was 24.6 years and 9.3 years for defined contribution Plan members;
 - (d) The average age of retiree Plan members was 70.7 and the average age of survivor Plan members is 77.5; and,
 - (e) There were 32,041 retired members receiving a pension and 3004 survivors receiving a survivor pension.
 - (f) Of the 32,041 retired members receiving a pension;
 - (i) 30,705 members were previously employed by Bell Canada;
 - (ii) 1026 members were previously employed by Expertech Installation Inc.;
 - (iii) 306 members were previously employed by Bell Mobility Inc.;

- (iv) 3 members were previously employed by Bell TV Inc; and
 - (v) 1 member was previously employed by Bell Media Inc.
- (g) Of the 3004 survivors receiving a survivors pension;
- (i) 2947 surviving members' spouses were previously employed by Bell Canada;
 - (ii) 46 surviving members' spouses were previously employed by Expertech Installation Inc.; and
 - (iii) 11 surviving members' spouses were previously employed by Bell Mobility Inc.

ii. Indexation under the Plan

26. Indexation is the amount that a monthly pension payment may be increased from one year to the next to provide a degree of inflation protection. Indexation is often referred to as a cost-of-living adjustment to reflect the amount that the pension payments must increase to keep pace with inflation in order to maintain retirees' standard of living.

27. Under the Plan, yearly indexation is calculated during the period of November 1 to October 31 of the year prior to the increase. Indexation is reflected in pension payments beginning on January 1 of each year.

28. The rate of indexation is governed by the Plan. The Plan provides for indexation as follows:

8.7 On every first day of January, the retirement benefits payable to a Member, the surviving Spouse or Beneficiary under the DB Provisions shall be augmented by a percentage determined as follows:

- (i) If, on the date of the increase, the Member has not reached 65 years of age, or would not have reached 65 years of age in the case of a surviving Spouse or Beneficiary, the Pension Index, limited to a maximum of 2% and calculated on a compounded basis.

(ii) If, on the date of the increase, the Member has reached 65 years of age, or would have reached 65 years of age in the case of a surviving Spouse or Beneficiary, the percentage shall be the greater of:

(a) 60% of the Pension Index, limited to a maximum of 4% and calculated on a compounded basis; or

(b) the percentage determined under paragraph (i) above.

(iii) For the purpose of any increase applicable to a Member, the surviving Spouse or the Beneficiary within the first year of retirement, the applicable percentage shall be prorated, taking into account the number of full calendar months of retirement in the calendar year preceding the date of the increase.

(iv) All percentage increases shall be rounded to the nearest 2 decimal points, except for the percentage increase under paragraph (i) above which shall be rounded to the nearest whole number.

29. The term "Pension Index" is defined in Section 1.29 of the Plan as follows:

"Pension Index" means the annual percentage increase of the Consumer Price Index, as determined by Statistics Canada, during the period of November 1 to October 31 immediately preceding the date of the pension increase.

iii. Improper Method of Indexation Calculation

30. As provided by section 1.29 of the Plan, the yearly indexation amount is "the annual percentage increase of the Consumer Price Index, as determined by Statistics Canada".

31. The Consumer Price Index ("CPI") is an indicator of changes in consumer prices experienced by Canadians. It is obtained by comparing, over time, the cost of a fixed basket of goods and services purchased by consumers. Statistics Canada publishes the annual percentage increase of the CPI on its website.

32. From January 1, 2017 to the end of 2017, the rate of indexation of the Plan is based upon the published Statistics Canada annual percentage increase of the CPI for the period of November 1, 2015 to October 31, 2016.

33. On November 18, 2016, Statistics Canada determined and published the annual percentage increase for the 12-month period of November 1, 2015 to October 31, 2016, which was 1.5 percent.

34. Under section 8.7 of the Plan, the percentage increase for 2017 was to be rounded to the nearest whole number. Any indexation percentage increase of 1.5 percent and above is rounded up to 2 percent. Any indexation percentage increase between 1.4 percent and 1.1 percent was to be rounded down to 1 percent.

35. Had the Administrator-Defendant used the annual percentage increase of the CPI, as determined and published by Statistics Canada, which it was required to do, the published increase of 1.5 percent should have been rounded up to a 2 percent rate of indexation for 2017, pursuant to the Plan.

36. Contrary to the terms of the Plan, the Administrator-Defendant did not rely on the published Statistics Canada CPI percentage increase. Instead, the Administrator-Defendant incorrectly calculated its own annual increase of CPI based on year-end figures for the period of November 1, 2015 to October 31, 2016. This approach favoured the Administrator-Defendant and Employer-Defendants at the expense of the Class Members and yielded a figure of 1.49 percent, which is less than the annual percentage increase of the CPI as determined and published by Statistics Canada.

37. The Administrator-Defendant used a CPI value of 129.1 for October 2016 and 127.2 for October 2015 and calculated the average increase to two decimal points, equaling 1.49 percent.

38. Relying on the 1.49 percent figure, the Administrator-Defendant then rounded the indexation rate down to a 1 percent figure to be used for indexation for the year 2017, which benefits the Defendants and was to the detriment of the Class.

39. The Administrator-Defendant's approach is contrary to the terms of the Plan.

40. Furthermore, the Administrator-Defendant's incorrect approach in respect to 2017 indexation is also inconsistent with some of its past practice where it has used a CPI increase figure which was rounded to one decimal point instead of two decimal points.

iv. Communication to the Class

41. The Administrator-Defendant described its indexation calculation in the Pension Information Committee Report dated December 31, 2016 as follows:

Cost-of-Living adjustments

The Plan provides for pension indexing each January 1 to partially compensate for cost-of-living increases. This formula takes into account the retiree's age on January 1 and the increase in the Consumer Price Index (CPI) over a 12-month period running from November 1 of one year to October 31 of the next. Here's how it works:

- Under age 65 – The increase in the CPI (rounded to the nearest whole number), up to a maximum of 2%
- Age 65 and over – The greater of:
 - 100% of the increase in the CPI (rounded to the nearest whole number), up to a maximum of 2% or
 - 60% of the increase in the CPI (rounded to the nearest 2 decimal points), up to a maximum of 4%

In the year of retirement, the applicable indexation rate is prorated based on the number of months since the retirement date.

Over the 12-month period ending in October 2016, the CPI increased by 1.49%. Therefore, the January 2017 adjustment applicable to all Bell retirees was 1%.

F. BREACH OF CONTRACT

42. The Class Members were employed by the Employer-Defendants for years. It was a common term of the employment contracts of all Class Members that they (and their survivors) would be entitled to an indexed pension, pursuant to the Plan. The Class Members' labour and employment was the consideration for an indexed pension that would be payable upon their retirement, or other event triggering entitlement.

43. The Plan was partially funded through contributions made by the Employer-Defendants in lieu of salary or wages throughout the Class Members' working lives. The receipt of the correct benefits under the Plan constitutes deferred compensation earned by the Class Members in the course of their employment.

44. The Employer-Defendants, as the prior employers of the Class Members, have a contractual obligation to Class Members to ensure that the terms of the Plan are met, and that the Class Members receive the correct pension benefits with applicable indexation.

45. As the administrator of the Plan, the Administrator-Defendant has a contractual obligation owed to the Class Members to calculate the appropriate rate of indexation under the Plan and ensure that Class Members receive the correct pension benefits with applicable indexation in accordance with the terms of the Plan.

46. By improperly calculating the indexation rate and failing to pay the Class Members the correct pension benefits, the Defendants have not honoured their contractual obligations to Class Members under the Plan.

47. The Defendants breached the terms of the contract. The particulars of the breach include:

- (a) failing to appropriately calculate the indexation rate and failing to pay the correct pension benefits owed to the Class Members, pursuant to the Plan;
- (b) failing to provide Class Members with accurate and timely administration information regarding their entitlement to an increased indexation rate;
- (c) by the Employer-Defendants in failing to ensure that indexation rate was correctly calculated by the Administrator-Defendant and ensure the correct amount of pension benefits were paid to the Class Members pursuant to the Plan; and
- (d) failing to act in accordance with the spirit, purpose and terms of the Plan.

48. The Defendants failed to correctly interpret and apply the provisions of the Plan by incorrectly calculating the indexation. By failing to use the published Statistics Canada CPI percentage increase, the Defendants favoured their own interests and acted contrary to the terms of the Plan. The Defendants interpretation and application of the indexation provisions is inconsistent with a practical and purposive interpretation of the Plan and is incorrect on its face.

49. Alternatively, the doctrine of *contra proferentem* applies to the interpretation of the Plan. The doctrine provides that where a contractual provision is sufficiently ambiguous, it will be construed against the party responsible for drafting and tendering the contract. The Defendants drafted the terms of the Plan. To the extent that there is any ambiguity in the relevant provisions in the Plan, the ambiguity should be resolved in favour of the Class.

G. BREACH OF TRUST

50. At all material times, the pension funds were to be held in trust by the Administrator-Defendant in favour of the Class Members. The pension funds are held exclusively on behalf of the Plan Members.

51. Pursuant to the Plan, the declaration of trust and the *Pension Benefits Standards Act*, 1985, R.S.C. 1985, c. 32 (2nd Supp.), the Administrator-Defendant administers the pension funds as a trustee :

Administration of pension plan and fund

8 (3) The administrator shall administer the pension plan and pension fund as a trustee for the employer, the members of the pension plan, former members, and any other persons entitled to pension benefits under the plan.

52. It is a term of the trust that the pension be indexed according to the Plan terms. Failure to comply with the Plan terms constitutes a breach of trust. The Administrator-Defendant's improper indexation, as set out above, is contrary to the Plan terms and constitutes a breach of trust.

H. BREACH OF FIDUCIARY DUTY

53. At all material times, the Administrator-Defendant acted, and continues to act, as the administrator of the Plan. The correct calculation of the indexation rate is crucial to the well-being of the Class Members.

54. The *Pension Benefits Standards Act*, 1985, R.S.C. 1985, c. 32 (2nd Supp.) sets out statutory duties that the Administrator-Defendant owes the Class Members, including:

Administration of pension plan and fund

8 (3) The administrator shall administer the pension plan and pension fund as a trustee for the employer, the members of the pension plan, former members, and any other persons entitled to pension benefits under the plan.

Standard of care

8 (4) In the administration of the pension plan and pension fund, the administrator shall exercise the degree of care that a person of ordinary prudence would exercise in dealing with the property of another person.

Manner of investing assets

8 (4.1) The administrator shall invest the assets of a pension fund in accordance with the regulations and in a manner that a reasonable and prudent person would apply in respect of a portfolio of investments of a pension fund.

Investment choices

8 (4.2) A pension plan may permit a member, former member, survivor or former spouse or former common law partner of a member or former member to make investment choices with respect to their account maintained in respect of a defined contribution provision or with respect to their account maintained for additional voluntary contributions.

Administrator's duty

8 (4.3) If a pension plan permits a member, former member, survivor or former spouse or former common law partner of a member or former member to make investment choices, the administrator must offer investment options of varying degrees of risk and expected return that would allow a reasonable and prudent person to create a portfolio of investments that is well adapted to their retirement needs.

Deemed compliance with subsection (4.1)

8 (4.4) With respect to the account for which an investment choice is made by a member, former member, survivor or former spouse or former common law partner of a member or former member, if an administrator offers investment options in accordance with subsection (4.3) and the regulations, that administrator is deemed to comply with subsection (4.1).

Special knowledge or skill

8 (5) Without limiting the generality of subsection (4), an administrator who in fact possesses, or by reason of profession or business ought to possess, a particular level of knowledge or skill relevant to the administration of a pension plan or pension fund shall employ that particular level of knowledge or skill in the administration of the pension plan or pension fund.

55. The statutory duties inform the common law duty of care owed by the Defendant Administrator as fiduciary and trustee.

56. The Administrator-Defendant has sole discretion and power over the Class Members' financial interests in administering and paying pension entitlements under the Plan. The Administrator-Defendant can unilaterally exercise such discretion over the interests of the Class Members by virtue of their position as administrator of the Plan. As administrator of the Plan, the Administrator-Defendant was bound to act in the utmost good faith in the administration of the Plan.

57. Class Members are entirely reliant on the skill and expertise of the Administrator-Defendant in the implementation of the Plan and payment of pension entitlements. The Class Members are in a wholly vulnerable position relative to the Administrator-Defendant by virtue of the complete control held by the Administrator-Defendant in the administration of the Plan. The vulnerability of the Class Members is amplified as a result of their position as seniors, many of whom are not able to re-enter the workforce, or face significant barriers to re-entry. The Plan exists solely for the benefit of Class Members. The Administrator-Defendant breached its fiduciary duties to the Plaintiff and the Class in its administration of the Plan. The particulars of the breach include:

- (a) failing to properly calculate the indexation rate owed to the Class Members pursuant to the Plan;

- (b) failing to provide Class Members with accurate and timely administration information regarding their entitlement to an increased indexation rate;
- (c) failing to take a proper and good faith approach in the administration of the Plan;
- (d) failing to act in accordance with the spirit, purpose and terms of the Plan;
- (e) favouring its own interests over that of Plan members; and
- (f) failing to safeguard the pension benefits of Class Members who rely on the Plan for support as they age;

58. The Administrator-Defendant failed to ensure that the best interests of the Class Members were being protected. In failing to appropriately calculate the rate of indexation under the Plan, the Administrator-Defendant sought to maximize its own interests at the expense of the Class.

59. The Administrator-Defendant has an ongoing financial obligation to fund and administer the Plan. The Administrator-Defendant favoured its interests, and those of the Employer-Defendants, over the interests of the Class Members by paying the Class Members less than their entitlement. The Administrator-Defendant's improper calculation of indexation was specifically designed to reduce the Class Members' entitlements over time and reduce the Employer-Defendants' required contributions to the Plan.

H. DAMAGES SUFFERED BY THE CLASS

60. The Plaintiff and Class Members have suffered damages as a result of the Defendant's actions. As a result of the failure to properly calculate and pay the correct amount of indexation, the value of each of the Class Members' pension entitlement is reduced and Class Members have been deprived of their correct payments under the Plan. The Defendants should compensate the Class for their loss.

61. The Defendants knew, or ought to have known, that as a result of their actions Class Members would suffer significant damages, including the following:

- (a) immediate loss reflected in reduced pension payments for 2017;
- (b) interest from the date Class Members should have received the proper payments; and,
- (c) future loss of reduced pension entitlements on a going forward basis.

62. In particular, Mr. Austin's immediate loss being the difference between a 2 percent indexation rate and a 1 percent indexation rate is approximately \$24.18 per month, amounting to \$290.16 in 2017. The present lump sum value of the loss when considering the lost payments and increases over the course of his life is much greater.

63. The Plaintiff seeks compensation for his loss and the loss of the Class for the amount they ought to have received (and would have received in the future) had the Plan indexation rate for 2017 been calculated properly, and includes the present lump sum value of the loss of pension benefits for the Class as a whole over the course of their lifetimes.

I. RELEVANT STATUTES

64. The Plaintiff pleads and relies upon the following statutes and regulations:

- (a) *Class Proceedings Act, 1992*, S.O. 1992, c. 6;
- (b) *Pension Benefits Standards Act, 1985*, R.S.C. 1985, c. 32 (2nd Supp.);
and
- (c) *Pension Benefits Standards Regulations, 1985*, S.O.R./87-19;

J. PLACE OF TRIAL

65. This action is commenced pursuant to the *Class Proceedings Act, 1992*, S.O. 1992, c. 6.

66. The Plaintiff requests that this action be tried in the City of Toronto, in the Province of Ontario.

January 16, 2018

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CN-18-590105
Court File No.: *00CP*

LESLIE AUSTIN
Plaintiff and
BELL CANADA
Defendants

**ONTARIO
SUPERIOR COURT OF JUSTICE**

Proceeding commenced at Toronto

Proceeding under the *Class Proceedings Act, 1992*

STATEMENT OF CLAIM

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*THIS IS EXHIBIT "B" REFERRED TO IN THE
AFFIDAVIT OF JASMINE RANDHAWA
SWORN BEFORE ME, THIS 23 DAY OF JULY, 2018*



A COMMISSIONER FOR TAKING AFFIDAVITS, ETC.



Brittany Tovee

KOSKIE MINSKY

JUSTICE MATTERS

December 20, 2017

Brittany Tovee
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Via E-mail eric.deslaurier@bell.ca

Eric Deslauriers
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Verdun, QC H3E 3B3

Dear Mr. Deslauriers:

**Re: Bell Canada Pension Plan
Our File No.: 17/1817**

Please find attached the authorization from Leslie Austin, a Bell Canada Pension Plan member. We kindly ask that the Bell Canada Pension Plan Administrator make the following documentation available for review and inspection, pursuant to the Office of the Superintendent of Financial Institutions "Pension Members' Guide":

- annual information returns;
- actuarial reports;
- the plan text; and,
- any plan amendments.

We would greatly appreciate it if the Administrator could confirm receipt of this request and provide us with a copy of the above noted documentation.

Should you have any questions, please do not hesitate to contact the undersigned directly.

Yours truly,

KOSKIE MINSKY LLP



Brittany Tovee
BT

cc Leslie Austin (Client)

*THIS IS EXHIBIT "C" REFERRED TO IN THE
AFFIDAVIT OF JASMINE RANDHAWA
SWORN BEFORE ME, THIS 25 DAY OF JULY, 2018*



A COMMISSIONER FOR TAKING AFFIDAVITS, ETC.



Brittany Tovee

BELL CANADA

PENSION PLAN

**Effective January 1, 2005
including amendments up to July 1, 2012**

Restated May 1, 2013

**BELL CANADA
PENSION PLAN
Effective January 1, 2005)**

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INTRODUCTION

UNDERTAKING

Effective January 1, 2005, the Plan was amended as reflected herein to provide for defined contribution ("DC") provisions. The purpose of the DC provisions of the Plan is to help DC Members to accumulate retirement savings on a tax-assisted basis. Any benefits provided under the DC provisions of the Plan shall be in addition to the benefits provided under the defined benefit ("DB") provisions of the Plan, as the case may be, which provide for the payment of definite amounts upon the Employees' termination of employment, retirement or death.

Employees shall cease to accrue Pensionable Employment under the DB provisions at the date the Employees start participating in the DC Provisions of the Plan.

An Employee eligible for benefits under the Plan shall not be allowed to renounce any of the benefits provided by the Plan, except as provided in sections 3, 8.5 and 13.2.

Any benefit payable under the Plan shall be calculated in accordance with the provisions of the Plan on the date of termination of employment, retirement or death of the Member, whichever date comes first.

All Employees who terminated employment, retired or died prior to January 1, 2005 or who elected to terminate under Bell Canada's Voluntary Early Retirement Program (2004) shall be entitled to the benefits calculated in accordance with the provisions of the pension plan in effect on December 31, 2004, except for the provision in the last paragraph of section 6.4 which applies to all Retired Members.

Effective January 1, 2005, the Plan was amended as reflected herein to provide for defined contribution ("DC") provisions. Any benefits provided under the DC provisions of the Plan shall be in addition to the benefits provided under the defined benefit ("DB") provisions of the Plan, as the case may be. Employees shall cease to accrue Pensionable Employment at the date the Employees start participating in the DC Provisions of the Plan.

Employees of the Company whose employment was transferred to Bell Aliant Regional Communications between July 7, 2006 and October 31, 2006 pursuant to the Property Exchange and Arrangement Agreement between BCE Inc. and Bell Canada and Aliant Inc. dated March 6, 2006, cease to participate in and accrue benefits under the Plan as of their date of transfer. Subject to regulatory approval under applicable legislation, the benefits accrued by such employees under the Plan are transferred to and assumed by the Bell Aliant Pension Plan (Ontario and Quebec) and assets determined in accordance with the Property Exchange and Arrangement Agreement referred to above shall be transferred from the Plan to the Bell Aliant Pension Plan (Ontario and Quebec).

PROTECTION OF PENSION RIGHTS

All Employees hired on or after January 1, 1987, except as otherwise provided in section 3 of appendix B, shall be entitled to the benefits calculated in accordance with the provisions of sections 1 to 15 of the Plan for their Pensionable Employment on or after January 1, 1987 and, for their Pensionable Employment prior to January 1, 1987, to the benefits calculated in accordance with the provisions of appendix A.

All Employees on December 31, 1986, except as otherwise provided in section 3 of appendix B and provided that they maintain Continuous Employment, shall be entitled, for their Pensionable Employment on or after January 1, 1987, to the larger of the benefits calculated in accordance with the provisions of sections 1 to 15 of the Plan or the benefits calculated in accordance with the provisions of appendix A and, for their Pensionable Employment prior to January 1, 1987, to the benefits calculated in accordance with the provisions of appendix A. These benefits shall be at least equivalent to those provided by the Plan in effect on December 31, 1986.

SECTION 1 - DEFINITIONS

In this text, unless the context requires a different meaning:

- 1.1 "Actuarial Equivalent" means a benefit of equal value calculated in the Prescribed Manner using a unisex actuarial basis as may be authorized from time to time by the Employees' Benefit Committee in the administration of the Plan, such basis being subject to the requirements of the Applicable Legislation;
- 1.2 "Applicable Legislation" means the Pension Benefits Standards Act, 1985 and Regulations thereunder or any other similar legislation applicable to a Member, and/or the Income Tax Act (Canada) and Regulations thereunder or any other similar provincial legislation;
- 1.3 "Average Annual Pensionable Earnings" means the annual average of DB Compensation determined for the Member for the 60 consecutive months for which DB Compensation is included that produce the highest average. If there are less than 60 months of DB Compensation determined for the Member, the average shall be calculated on the total DB Compensation determined;
- 1.4 "Beneficiary" means a person designated by the Member, by giving written notice of such designation to the Employees' Benefit Committee, to receive the benefits payable under the Plan upon the Member's death. Subject to the restrictions which may be provided under Applicable Legislation, a Member may subsequently change such designation by giving written notice of such change to the Employees' Benefit Committee. In the absence of an effective designation, the Member's estate shall be deemed to be the Beneficiary for purposes of the Plan;
- 1.5 "Company" means Bell Canada and/or its successors;
- 1.6 "Continuous Employment" means employment without regard to periods of temporary interruption of employment as determined under the applicable rules of the Company or the relevant Participating Company;
- 1.7 "DB Compensation" means, for each month, the highest basic pay and such other forms of remuneration actually received for the month as are considered to be earnings for pension purposes under the applicable rules of the Company or the relevant Participating Company, including annualized remuneration for periods not worked when Continuous Employment is maintained but excluding all payments related to overtime and any lump sum paid at termination of employment or retirement in lieu of vacation or other considerations; when a lump sum is paid as remuneration in respect of a period of more than one month, it is assumed that it is paid uniformly over such period. In addition, for part-time Employees, DB Compensation in a calendar month shall include annualized remuneration for the period not worked;

- 1.8 "DB Provisions" means the defined benefit-specific provisions of the Plan;
- 1.9 "DC Compensation" means, for each month, the basic pay and such other forms of remuneration actually received during the month as are considered to be earnings for pension purposes under the applicable rules of the Company or the relevant Participating Company, including annualized remuneration for periods not worked when Continuous Employment is maintained but excluding all payments related to overtime and any lump sum paid at termination of employment or retirement in lieu of vacation or other considerations;
- 1.10 "DC Employer Contributions" means the contributions made in accordance with section 4.3 of the Plan and which are deposited in the DC Member Account in respect of a DC Member;
- 1.11 "DC Member" means a Member who is entitled to benefits calculated in accordance with the DC Provisions of the Plan;
- 1.12 "DC Member Account" means the aggregate of any DC Member Contributions and of DC Employer Contributions plus Investment Earnings thereon, in respect of a DC Member;
- 1.13 "DC Member Additional Account" means the aggregate of any DC Member Additional Contributions plus Investment Earnings thereon;
- 1.14 "DC Member Additional Contributions" means the contributions which a DC Member makes in accordance with section 4.2 of the Plan and which are deposited in his DC Member Additional Account;
- 1.15 "DC Member Contributions" means the contributions which a DC Member makes in accordance with section 4.1 of the Plan and which are deposited in his DC Member Account;
- 1.16 "DC Provisions" means the defined contribution-specific provisions under sections 1 to 15 of the Plan;
- 1.17 "Directors" means the Board of Directors of the Company;
- 1.18 "Employee" means a person who receives a regular and stated Compensation from the Company or one of the Participating Companies, other than a pension or retainer;
- 1.19 "Employees' Benefit Committee" means the Employees' Benefit Committee described in section 2;
- 1.20 "Fund" means the Fund referred to in section 12;

- 1.21 "Funding Agent" means the trust company or the insurance company designated by the Company and named in the trust agreement or insurance company contract, as applicable;
- 1.22 "Investment Earnings" means the investment gains and losses made by each DC Member Account and each DC Member Additional Account. The method used for calculating and allocating Investment Earnings shall be determined by the Employees' Benefit Committee;
- 1.23 "Latest Permissible Retirement Date" means the end of the calendar year in which the Member attains 71 years of age, or such other time as is acceptable under the Applicable Legislation;
- 1.24 "Maximum Pensionable Earnings" means the maximum pensionable earnings under the Canada Pension Plan or the Quebec Pension Plan, as applicable, for the year in which the Member terminates employment, retires or dies, whichever comes first;
- 1.25 "Member" means an Employee to whom the Plan applies, or a Retired Member, or a former Employee who is entitled to a deferred pension from the Plan;
- 1.26 "Participating Company" means any affiliated company federally regulated for pension purposes and designated as participating company by one of the applicable officers of the Company as authorized by the Directors for this purpose;
- 1.27 "Pensionable Age" means the last day of the month during which a Member attains the age of 65;
- 1.28 "Pensionable Employment" means, for full-time Employees, the aggregate of the periods of employment recognized under the applicable rules of the Company or the relevant Participating Company, subject to Applicable Legislation. For part-time Employees, Pensionable Employment in a year shall be calculated as the equivalent portion of full-time employment. An Employee shall not accrue or shall cease to accrue Pensionable Employment during the period the Employee is a DC Member under the Plan;
- 1.29 "Pension Index" means the annual percentage increase of the Consumer Price Index, as determined by Statistics Canada, during the period of November 1 to October 31 immediately preceding the date of the pension increase;
- 1.30 "Plan" means this revised and restated pension plan, which restatement shall have an effective date of January 1, 2005, and as may be further amended from time to time; this Plan continues the pension plan in effect on December 31, 2004;
- 1.31 "Prescribed Manner" means as prescribed under the Applicable Legislation;
- 1.32 "Provincial Property Law" means the law of a province relating to the distribution, pursuant to court order or agreement between the spouses, of the property of the spouses on divorce,

annulment or separation;

- 1.33 "Reciprocal Agreement" means an agreement for the interchange of credit for employment and the allocation of related obligations between the Company and/or the relevant Participating Companies and other affiliated or associated entities as referred to in section 13;
- 1.34 "Retired Member" means a former Employee who receives a pension from the Plan;
- 1.35 "Spouse" means a person who is cohabiting with the Member in a conjugal relationship at the relevant time, having so cohabited with the Member for at least one year or if there is no such person, a person who is married to the Member or who is party to a void marriage with the Member;
- 1.36 "Term of Employment" means period of employment with the Company, any Participating Company or any entities with which Reciprocal Agreements have been entered into with the Company or Participating Companies, as determined under the applicable rules of the Company or the relevant Participating Company.

The singular includes the plural and vice-versa and reference to the male gender shall include the female gender and vice-versa.

SECTION 2 - ADMINISTRATION

- 2.1 The Company shall be the administrator of the Plan.
- 2.2 The Directors shall use ordinary care and diligence in the performance of their duties, but no director shall be personally liable by virtue of any agreement or other instrument made by or on behalf of a director, nor for any loss unless resulting from the gross negligence or willful misconduct of a director, and no director shall be liable for the omissions or wrongdoings of any other director.
- 2.3 A committee called Employees' Benefit Committee shall be charged with the administration of the Plan. This committee shall consist of individuals as the Directors may appoint from time to time.
- 2.4 The Employees' Benefit Committee shall have the specific powers granted to it by the Directors and such other powers as may be necessary in order to enable it to administer the Plan, including the power to delegate all or a portion of its powers to individuals appointed by, or similar committees established by the Participating Companies.
- 2.5 The Employees' Benefit Committee shall determine conclusively for all parties all questions arising out of the administration of the Plan.
- 2.6 The Employees' Benefit Committee shall be empowered to authorize disbursements according to the provisions of the Plan.
- 2.7 The Employees' Benefit Committee shall adopt such by-laws and rules of procedure as it may find necessary.
- 2.8 The Employees' Benefit Committee shall be empowered to appoint a secretary and such other assistants as may be required in the administration of the Plan.
- 2.9 The DB Compensation, DC Compensation and the continuity and length of a Member's Pensionable Employment and Term of Employment shall be as shown on the records of the Company or of the relevant Participating Companies.
- 2.10 A committee called Pension Information Committee shall be established in the Prescribed Manner. The role of this committee shall be to promote awareness and understanding of the Plan among Members, and review, for information purposes, the financial, actuarial and administrative aspects of the Plan.
- 2.11 The expenses incurred in administering the Plan shall be paid by the Company and the Participating Companies unless paid by the Fund.

SECTION 3 - ELIGIBILITY

- 3.1 All Employees shall become Members of the Plan after they have completed a Term of Employment of 24 months, except for Employees who, because of their religious beliefs, object to becoming Members of the Plan.
- 3.2 Notwithstanding section 3.1, Employees hired on or after October 1, 2004 shall become DC Members of the Plan after they have completed a Term of Employment of 3 months, unless otherwise provided under the applicable collective agreement provisions or rules of the Company or the relevant Participating Company and except for Employees who, because of their religious beliefs, object to becoming Members of the Plan. An Employee who becomes a DC Member in accordance with this section 3.2 shall not accrue Pensionable Employment under the DB Provisions.
- 3.3 Notwithstanding section 3.1, an Employee who was hired before October 1, 2004 may elect to become a DC Member as of January 1, 2005, or as of the date on which the Employee becomes eligible to participate in the DC Provisions of the Plan under the applicable collective agreement provisions or rules of the Company or the relevant Participating Company. The election must be provided in writing to the Employees' Benefit Committee within 90 days preceding the date on which the Employee becomes eligible to participate in the DC Provisions of the Plan.

An Employee who elects to become a DC Member in accordance with this section 3.3 shall cease to accrue Pensionable Employment from the date the Employee starts participating in the DC Provisions of the Plan.

SECTION 4 – CONTRIBUTIONS

DC Provisions

- 4.1 In each calendar year or portion thereof, a DC Member may elect to make DC Member Contributions, subject to section 4.6. Such DC Member Contributions shall be equal to 0%, 1% or 2% of the DC Compensation, as elected by the DC Member. The DC Member may elect to change the contribution rate as permitted under the applicable rules of the Company or the relevant Participating Company.
- 4.2 In each calendar year or portion thereof, a DC Member who makes DC Member Contributions equal to 2% of the DC Compensation may elect to make DC Member Additional Contributions, subject to section 4.6. Such DC Member Additional Contributions shall be equal to 0%, 1% or 2% of the DC Compensation, as elected by the DC Member. The DC Member may elect to change the contribution rate as permitted under the applicable rules of the Company or the relevant Participating Company.
- 4.3 In each calendar year or portion thereof, DC Employer Contributions shall be deposited in the DC Member Account of the DC Member, subject to sections 4.6 and 4.9. Such DC Employer Contributions shall be equal to 4% of the DC Compensation, plus an amount equal to any DC Member Contributions made by the DC Member.
- 4.4 All DC Member Contributions and DC Employer Contributions become vested immediately upon allocation to the DC Member Account. All DC Member Additional Contributions become vested immediately upon allocation to the DC Member Additional Account.
- 4.5 The contributions under sections 4.1, 4.2 and 4.3 in respect of a DC Member shall cease upon the earliest of the DC Member's termination of employment, retirement or death.
- 4.6 The total of the DC Member Contributions, the DC Member Additional Contributions and the DC Employer Contributions in any calendar year in respect of a DC Member shall not exceed the amount of contributions permissible under the Income Tax Act (Canada), after appropriate recognition of any applicable pension credit accrued by the DC Member in respect of such calendar year under the DB Provisions.

Notwithstanding the above, to avoid the revocation of the registration of the Plan, a portion of the contributions made under the Plan by a Member, the Company or a Participating Company may be returned to such Member, the Company or such Participating Company.

DB Provisions

- 4.7 Members are neither required nor permitted to make contributions under the DB Provisions of the Plan.
- 4.8 Subject to section 4.9, contributions that are eligible contributions under Applicable Legislation shall be paid by the Corporation and the Participating Companies into the Fund within such periods of time and in at least such amounts as are prescribed by Applicable Legislation and as recommended by a Fellow of the Canadian Institute of Actuaries in accordance with accepted actuarial practice.

However, notwithstanding the above, to avoid the revocation of the registration of the Plan, a portion of the contributions made under the Plan by the Company or a Participating Company may be returned to the Company or such Participating Company.

Contributions - General

- 4.9 If at anytime while the Plan continues in existence a Fellow of the Canadian Institute of Actuaries certifies that the assets of the Fund exceed the actuarial and other liabilities of the Plan in respect of benefits set forth in the Plan:
- (a) The Company's or any Participating Company's contribution obligation under section 4.8 shall be reduced by an equal amount or by a lesser amount, all as determined by the Company on the advice of the Fellow of the Canadian Institute of Actuaries, subject to any limits prescribed by Applicable Legislation; and
 - (b) For greater certainty, the Company may, subject to applicable law, on the advice of the Fellow of the Canadian Institute of Actuaries, direct the Funding Agent to apply assets of the Fund held in relation to the DB Provisions to the DC Member Accounts to satisfy the Company's or a Participating Company's contribution requirements under section 4.3 of the Plan.

SECTION 5 – RETIREMENT BENEFITS**DC Provisions**

5.1 After having attained age 55, a DC Member shall retire, or is deemed to have retired, on the earliest date between his termination of employment date and the Latest Permissible Retirement Date if he remains employed by a Participating Company beyond that last date, and shall receive

- (i) the balance of the DC Member Account in the form of a lump sum transfer to another registered pension plan (if that other plan permits), to a retirement savings plan of the prescribed kind, or to an insurance company for the purchase of an immediate or deferred life annuity, payable no later than as permitted under Applicable Legislation; plus
- (ii) a lump sum payment equal to the balance of the DC Member Additional Account.

The transfer under this paragraph shall be subject to any limitation prescribed by the Applicable Legislation related thereto. The request for transfer must be provided in writing to the Employees' Benefit Committee within 90 days of the date of termination of employment.

DB Provisions

5.2 An Employee who retires on the date Pensionable Age is reached shall be granted an annual pension of an amount equal to the sum of:

- (i) 1% of that part of the Member's Average Annual Pensionable Earnings which does not exceed the Maximum Pensionable Earnings; and
- (ii) 1.7% of that part of the Member's Average Annual Pensionable Earnings in excess of the Maximum Pensionable Earnings;

for each year of Pensionable Employment on or after January 1, 1987.

An Employee who has elected to become a DC Member in accordance with section 3.3 and who retires on the date Pensionable Age is reached shall be granted an additional annual pension, equal to 0.2% of that part of the Member's Average Annual Pensionable Earnings which does not exceed the Maximum Pensionable Earnings, multiplied by the number of years of Pensionable Employment between January 1, 1987 and December 31, 2004.

Any period of less than 12 months of Pensionable Employment shall be included on a proportionate basis.

- 5.3 An Employee who terminates employment after having attained age 55 may elect to retire on the last day of any month thereafter but no later than the Latest Permissible Retirement Date, and shall be granted an annual pension calculated in accordance with section 5.2, using the Member's Pensionable Employment at the date of termination of employment and, if the date of retirement is prior to the date Pensionable Age is reached, reduced by $\frac{1}{4}$ of 1% for each month by which the date of retirement precedes the date Pensionable Age is reached.

Notwithstanding the above, if an Employee remains employed by a Participating Company beyond the Latest Permissible Retirement Date, he is deemed to have retired on the Latest Permissible Retirement Date and shall be granted an annual pension, calculated in accordance with section 5.2, using the Member's Pensionable Employment at the Latest Permissible Retirement Date.

- 5.4 Any pension under the DB Provisions of the Plan is payable during the lifetime of the Retired Member.
- 5.5 Notwithstanding anything to the contrary in the Plan with the exception of the actuarial adjustment provided in section 10, the annual rate of pension that may be granted from all registered pension plans of the Company or a Participating Company (but ignoring the benefits provided under the DC provisions of the Plan) upon death, retirement, termination of employment of the Member or termination of the Plan shall not exceed the lesser of:
- (i) \$2,000.00 or such other limit determined under the Income Tax Act (Canada) for the year of pension calculation times the number of years of Pensionable Employment; or
 - (ii) 2% of the Member's Average Annual Pensionable Earnings times the number of years of Pensionable Employment.

The number of years of Pensionable Employment must not exceed 35 with respect to the period before January 1, 1992.

The maximum pension specified above (i.e., the lesser of (i) or (ii) above) shall be reduced by $\frac{1}{4}$ of 1% for each completed month by which the date of retirement precedes the earliest of age 60, 30 years of Term of Employment or the date on which the Member's age plus Term of Employment is equal to 80, assuming employment continues to such date.

The restrictions of this section 5.5 shall apply to all lifetime pension benefits payable in respect of the Member, excluding any benefit payable under the DC provisions of the Plan, including benefits payable to an ex-Spouse of a Member upon marriage breakdown, whether payable upon death, retirement, termination of employment, or termination of the Plan.

SECTION 6 – DEATH BENEFITS**DC Provisions**

- 6.1 Subject to section 6.2, if a DC Member dies before having received benefits in accordance with the DC Provisions under section 5 or section 7, the Spouse or, if there is no Spouse, the Beneficiary, shall receive, in a lump sum, the benefit that the DC Member would have been eligible to receive in accordance with the DC Provisions under section 5 or section 7, as applicable, had the DC Member retired or terminated employment on the date of death.
- 6.2 The balance of the DC Member Account payable to the Spouse under section 6.1 shall be paid in the form of a lump sum transfer to another registered pension plan (if that other plan permits), to a retirement savings plan of the prescribed kind, or to an insurance company for the purchase of an immediate or deferred life annuity. The transfer under this paragraph shall be subject to any limitation prescribed by the Applicable Legislation related thereto.

The request for transfer must be provided in writing to the Employees' Benefit Committee within 90 days of the date of death.

DB Provisions

- 6.3 On the death of a Member prior to retirement, the surviving Spouse or, if there is no Spouse, the Beneficiary, shall receive the lump sum Actuarial Equivalent of the deferred pension calculated in accordance with section 5.2, that relates to the Pensionable Employment subsequent to December 31, 1986 and to which the Member is entitled or would have been entitled if the Member had terminated employment on the date of death.

The benefit payable to the Spouse under this section 6.3 shall be paid in the form of a lump sum transfer in Prescribed Manner, in accordance with section 9.

Notwithstanding the above and subject to section 9.2, on the death prior to retirement of a Member who has attained age 55, the surviving Spouse entitled to a lump sum in accordance with the preceding paragraphs, if any, may instead elect to receive a survivor pension that is the Actuarial Equivalent of this lump sum.

- 6.4 If a Member has a Spouse on the date of retirement, the pension payable shall automatically be reduced on an Actuarial Equivalent basis so that such surviving Spouse shall be paid for life a pension equal to 60% of such reduced pension payable to the Member. If the Member has waived the life insurance coverage under the benefits program at retirement, if applicable, then the Actuarial Equivalent reduction shall be made on the basis that the Fund will subsidize one-third of the pension to the surviving Spouse.

Subject to the Spouse's written agreement in Prescribed Manner being deposited with the Employees' Benefit Committee prior to the date of retirement, the Member may elect to receive instead an unreduced pension payable for life.

In the event of divorce, annulment or separation, given that no part of the Retired Member benefits is required to be distributed pursuant to subsection 8.5, and subject to the Spouse's written agreement in Prescribed Manner being deposited with the Employees' Benefit Committee, the amount of pension payable to the Retired Member shall be reinstated to the full amount from the first day of the month following the date the Spouse's agreement is provided to the Employees' Benefit Committee.

- 6.5 If a Member has no Spouse on the date of retirement or the Spouse's written agreement in Prescribed Manner has been deposited with the Employees' Benefit Committee prior to the date of retirement, the Member may elect to receive a pension reduced on an Actuarial Equivalent basis so that it is guaranteed to be payable for a minimum of 120 monthly payments.

The benefit payable to a Member's Beneficiary under a guarantee option may, if so requested by the Beneficiary, be paid in a lump sum Actuarial Equivalent of the remaining payments under the guarantee option.

In the event of the death of a designated Beneficiary who is in receipt of guaranteed payments under the Plan prior to the end of such guaranteed period, the balance of such payments shall be paid to the estate of the deceased Member in a lump sum Actuarial Equivalent of the remaining payments under the guarantee option.

SECTION 7 – TERMINATION BENEFITS**DC Provisions**

- 7.1 A DC Member whose employment terminates for any reason other than death or retirement shall receive
- (i) the balance of the DC Member Account in the form of a lump sum transfer to another registered pension plan (if that other plan permits), to a retirement savings plan of the prescribed kind, or to an insurance company for the purchase of an immediate or deferred life annuity, payable no later than as permitted under Applicable Legislation; plus
 - (ii) a lump sum payment equal to the balance of the DC Member Additional Account.

The transfer under this paragraph shall be subject to any limitation prescribed by the Applicable Legislation related thereto. The request for transfer must be provided in writing to the Employees' Benefit Committee within 90 days of the date of termination of employment.

DB Provisions

- 7.2 An Employee whose employment terminates for any reason other than death or retirement shall be entitled to a deferred pension payable from Pensionable Age that relates to the Pensionable Employment subsequent to December 31, 1986 and is calculated in accordance with section 5.2.
- 7.3 A Member entitled to a deferred pension under section 7.2 may elect to retire on the last day of any month after attainment of age 55 and before Pensionable Age is reached. The Member shall then be granted an annual pension that is the Actuarial Equivalent of the deferred pension.

The annual pension payable under this section 7.3 shall not exceed the amount of deferred pension payable under section 7.2 reduced by $\frac{1}{4}$ of 1% for each completed month by which the date of retirement precedes the earliest of age 60, 30 years of Term of Employment or the date on which the Member's age plus Term of Employment is equal to 80 assuming employment continues to such date.

SECTION 8 - PAYMENT OF BENEFITS

- 8.1 All pensions shall be paid monthly and the first payment thereof shall become due at the end of the month following the month during which retirement takes place or death occurs. Further payments shall be made at the end of each month up to and including the last day of the month during which the Retired Member or the surviving Spouse dies.
- 8.2 Any benefit payable under the Plan shall be paid in Canadian currency.
- 8.3 Except as provided for in section 9, no pension benefit is capable of being surrendered or commuted during the lifetime of the Member, the Member's Spouse or the Member's Beneficiary or confers upon any Member or personal representative, dependent or other person, any right or interest therein that is capable of being surrendered or commuted during the lifetime of the Member or the Member's Spouse.
- 8.4 No pension, survivor or other benefit payable under the Plan shall be capable of being assigned, charged, anticipated or given as security and they shall not confer upon any Member, personal representative, dependent or other person, any right or interest therein that is capable of being assigned, charged, anticipated or given as security except as required by law.
- 8.5 In this section 8.5, "spouse" has, in relation to a court order, the same meaning that it has in the applicable Provincial Property Law and, in relation to an assignment or agreement referred to in this section, the same meaning as in section 1.34 of the Plan.

In the event of divorce, annulment or separation, the benefits of the Member under the Plan shall be subject to the applicable Provincial Property Law.

Notwithstanding Provincial Property Law, the Member may assign all or part of the benefits under the Plan to the Spouse effective as of divorce, annulment or separation. In the event of such an assignment, the Spouse shall, in respect of the assigned portion of the benefits, be deemed to have been a Member of the Plan and to have ceased to be a Member as of the effective date of the assignment, but a subsequent spouse of that assignee Spouse is not entitled to any benefit whatsoever in respect of that assigned portion.

In this section 8.5, where all or part of the benefits of the Member are to be distributed to the Spouse,

- (i) the Actuarial Equivalent of the benefits payable to the Member after the distribution, plus
- (ii) the Actuarial Equivalent of the benefits payable to the Spouse of the Member on account of the distribution, shall equal
- (iii) the Actuarial Equivalent of the benefits payable to the Member had the divorce, annulment or separation not occurred.

- 8.6 Every person eligible for benefits under the Plan shall, on request, furnish such information, including but not limited to proof of age, satisfactory to the Employees' Benefit Committee as it shall require to determine the entitlement to and the amount of such benefit.
- 8.7 On every first day of January, the retirement benefits payable to a Member, the surviving Spouse or the Beneficiary under the DB Provisions shall be augmented by a percentage determined as follows:
- (i) If, on the date of the increase, the Member has not reached 65 years of age, or would not have reached 65 years of age in the case of a surviving Spouse or Beneficiary, the Pension Index, limited to a maximum of 2% and calculated on a compounded basis.
 - (ii) If, on the date of the increase, the Member has reached 65 years of age, or would have reached 65 years of age in the case of a surviving Spouse or Beneficiary, the percentage shall be the greater of:
 - (a) 60% of the Pension Index, limited to a maximum of 4% and calculated on a compounded basis; or
 - (b) the percentage determined under paragraph (i) above.
 - (iii) For the purpose of any increase applicable to a Member, the surviving Spouse or the Beneficiary within the first year of retirement, the applicable percentage shall be prorated, taking into account the number of full calendar months of retirement in the calendar year preceding the date of the increase.
 - (iv) All percentage increases shall be rounded to the nearest 2 decimal points, except for the percentage increase under paragraph (i) above which shall be rounded to the nearest whole number.
- 8.8 The termination benefits payable after retirement under the DB Provisions to a Member, or the surviving Spouse, as applicable, shall be augmented based on the provisions of section 8.7.
- 8.9 In the event a person entitled to benefits under the Plan is physically, mentally or otherwise incompetent to receive such benefits and to give a valid release therefore, the Employees' Benefit Committee may authorize the payment of such benefits in trust to such other person as it may consider appropriate. Such payment of benefits shall be a valid and complete discharge to the Plan in respect of that payment.

SECTION 9 - PORTABILITY

9.1 Where an Employee, before becoming eligible to retire pursuant to section 5, terminates employment or dies, the Member or the surviving Spouse, as the case may be, is entitled to transfer in Prescribed Manner the lump sum Actuarial Equivalent of the benefits payable under the DB Provisions:

- (i) to another registered pension plan (if that other plan permits), or
- (ii) to a retirement savings plan of the prescribed kind , or
- (iii) to purchase an immediate or deferred life annuity, payable no later than as permitted under Applicable Legislation.

The request for transfer must be provided in writing to the Employees' Benefit Committee within 90 days of the date of termination of employment or death, as the case may be. Following the expiration of the 90-days period, the Member or the surviving Spouse, as the case may be, is deemed to have elected to receive a deferred pension until a subsequent request for transfer is provided in writing to the Employees' Benefit Committee.

9.2 Notwithstanding section 9.1, where the sum of the DC Member Account and the lump sum Actuarial Equivalent of the benefits payable under the DB Provisions is less than 20% of the Maximum Pensionable Earnings for the year the Member terminates employment, retires or dies, or such other limit as may be prescribed under the Applicable Legislation, the aggregate value of the DC Member Account and the lump sum Actuarial Equivalent of the benefits payable under the DB Provisions will be paid in cash to the Member or the surviving Spouse.

SECTION 10- INTEGRATED PENSION

- 10.1 A Member may, prior to the date of retirement, elect in writing to receive an integrated pension in lieu of the pension payable under the DB Provisions of the Plan.
- 10.2 The integrated pension shall be computed so that it is the Actuarial Equivalent of the pension payable under the DB Provisions of the Plan and it shall begin from the date the pension would otherwise have started to be paid.
- 10.3 The integrated pension shall consist of a pension payable initially at a rate higher than the rate of the pension payable and subject from Pensionable Age to a reduction, such reduction not exceeding the maximum amount permitted under Paragraph 8503(2)(b) of the Income Tax Act (Canada).
- 10.4 An election made by a Member pursuant to this section shall not affect in any way the rights which the surviving Spouse or the Beneficiary would have had if the Member had not made such election.

SECTION 11 – INVESTMENT

- 11.1 The individual DC Member Account of a DC Member shall be credited with DC Member Contributions and DC Employer Contributions.
- 11.2 The individual DC Member Additional Account of a DC Member shall be credited with DC Member Additional Contributions.
- 11.3 Each DC Member shall instruct the Funding Agent to invest his or her DC Member Account and his or her DC Member Additional Account, in such portions as the DC Member directs, in one or more of the investment funds as may be made available to DC Members from time to time by the Company. The Funding Agent shall invest each DC Member Account and each DC Member Additional Account as so instructed or, in the absence of such instruction from the DC Member, in any default investment fund selected by the Company for that purpose.

DC Members may make or change their instructions to the Funding Agent at such times and conditions as determined under the applicable rules of the Company or the relevant Participating Company.

- 11.4 DC Member Accounts and DC Member Additional Accounts shall be valued at least annually, at which time interest, dividend and other investment gains and losses, net of management fees and expenses, shall be allocated to each account, all as defined in the applicable rules of the Company or the relevant Participating Company.

SECTION 12 - FUND

- 12.1 The Company undertakes to maintain a Fund to meet all liabilities under the Plan. The Fund shall at all times be held by a Funding Agent and shall be invested in accordance with Applicable Legislation.
- 12.2 The Company and the Participating Companies shall have no obligation to make any payments to the Fund except as expressly provided in the Plan and Applicable Legislation. Each Member, the heirs, executors, administrators or other personal representatives of the Member expressly release the Company, the Participating Companies, its respective officers and Directors from any liability for any loss or damage in connection with the Plan, except for willful misconduct.
- 12.3 Except as provided in section 14, the Fund shall be used exclusively for the payment of benefits provided under the Plan and for the payment of expenses of the Plan and of the Fund.
- 12.4 The fiscal year of the Fund and of the Plan shall end on December 31.

SECTION 13 - RECIPROCAL AGREEMENTS

- 13.1 The Company and the Participating Companies may from time to time enter into Reciprocal Agreements with other corporations or entities whether or not they are affiliated or associated.
- 13.2 A Member who may be eligible for benefits under a Reciprocal Agreement may elect to use the provisions of such agreement in lieu of receiving any benefit to which the Member may be entitled under the Plan.

SECTION 14 - AMENDMENT OR TERMINATION OF THE PLAN

- 14.1 The Company reserves the right to amend or terminate the Plan at any time as well as to reduce or discontinue contributions at any time or, subject to Applicable Legislation, withdraw from the Fund any part of the funding excess as determined by an actuarial valuation. No amendment to the Plan shall have the effect of diminishing the benefits accrued to or in respect of any Member, surviving Spouse or Beneficiary to the date of such amendment.
- 14.2 Should the Company decide to terminate the Plan, the Fund, after provision for expenses of termination and liquidation, shall be applied in an equitable manner determined by the Company to provide for benefits accrued to Members, surviving Spouses or Beneficiaries, all in accordance with Applicable Legislation. As and when all liabilities of the Plan have been legally discharged, any balance of the Fund then remaining shall be paid to the Company.

SECTION 15 - INFORMATION RELATIVE TO THE PLAN

- 15.1 The Company and the Participating Companies shall provide, in Prescribed Manner, Employees and their Spouses with a written explanation of the Plan and of any amendments thereto and an explanation of their rights and duties, with reference to the benefits available.
- 15.2 The Company and the Participating Companies shall provide active Members and their Spouses each year a written statement in Prescribed Manner showing
- (i) the pension to which the Member is entitled at the end of the year;
 - (ii) the funded ratio of the Plan, and
 - (iii) any other information prescribed by Applicable Legislation.
- 15.3 Once each year a Member, the Member's Spouse or, if authorized in writing, their agent, may examine documents pertaining to the Plan in Prescribed Manner.
- 15.4 The Company and the Participating Companies shall provide in Prescribed Manner the Member, the surviving Spouse or the Beneficiary a written statement of the Member's benefits after the Member's date of retirement, death or termination of employment, as the case may be.

APPENDIX A

**APPLICABLE PROVISIONS FROM THE
PENSION PLAN IN EFFECT ON DECEMBER 31, 1986**

PREAMBLE TO APPENDIX A

The provisions of appendix A shall be read in conjunction with the provisions of sections 1 to 15 of the Plan and shall apply only to Employees who have service with the Company prior to January 1, 1987.

Notwithstanding anything to the contrary, the provisions of appendix A shall not apply to Employees who were members of the BCE Mobile Communications Inc. Pension Plan as of December 31, 2000, except as otherwise provided in section B3.

SECTION A1 - DEFINITIONS

A1.1 In appendix A, all the terms defined in section 1 of the Plan have the meaning contained in section 1, except that prior to January 1, 1992:

"DB Compensation" had the same meaning as in section 1.7 except that for part-time Employees, DB Compensation in a calendar month excluded annualized remuneration for the period not worked;

"Pensionable Employment" meant the aggregate of the periods of employment recognized under the applicable rules of the Company or the relevant Participating Company for full-time Employees and for part-time Employees.

SECTION A2- RETIREMENT BENEFITS

A2.1 A Member who terminates employment and

- (a) has attained age 65 and whose Term of Employment is 15 or more years, or
- (b) has attained age 60 and whose completed years of age plus completed years of Term of Employment equal or exceed 80, or
- (c) has attained age 55 and whose age plus Term of Employment equal or exceed 85

may elect to retire on the last day of any month thereafter but no later than the Latest Permissible Retirement Date, and shall be granted an annual pension payable for life.

A2.2 A Member who terminates employment, has attained age 60 and does not qualify under section A2.1 may elect to retire on the last day of any month thereafter but no later than the Latest Permissible Retirement Date, and shall be granted an annual pension payable for life.

Notwithstanding the above, if an Employee remains employed by a Participating Company beyond the Latest Permissible Retirement Date, he is deemed to have retired on the Latest Permissible Retirement Date and shall be granted an annual pension payable for life, calculated using the Member's Pensionable Employment at the Latest Permissible Retirement Date.

A2.3 A Member who terminates employment, has attained age 55 but not age 60 and does not qualify under section A2.1 may elect to retire on the last day of any month thereafter, and shall be granted an annual pension payable for life that is the Actuarial Equivalent of the deferred pension becoming due at the end of the month following the month during which the Member's 60th birthday is attained.

A2.4 (a) The annual pension payable prior to reaching Pensionable Age shall be equal to the sum of:

- (i) 1.3% plus .01% for each three full months by which the Member's age at the date of retirement exceeds age 55 (subject to a maximum of 1.5%) of the Member's Average Annual Pensionable Earnings, and
- (ii) 0.5% of the lesser of \$10,000 or the Member's Average Annual Pensionable Earnings

for each year of Pensionable Employment, subject to the bridging benefit limit specified under Applicable Legislation.

- (b) The annual pension payable from the date Pensionable Age is reached shall be equal to the sum of
- (i) for each year of the Member's Pensionable Employment prior to January 1, 1966, an amount determined in accordance with paragraphs (a)(i) and (a)(ii) above, and
 - (ii) for each year of the Member's Pensionable Employment from January 1, 1966,

0.85% of that part of the Member's Average Annual Pensionable Earnings which does not exceed the Maximum Pensionable Earnings, and

1.3% plus .01% for each three full months by which the Member's age at the date of retirement exceeds age 55 (subject to a maximum of 1.5%) of the Member's Average Annual Pensionable Earnings in excess of the Maximum Pensionable Earnings.
- (c) An Employee who has elected to become a DC Member in accordance with section 3.3 shall be granted an additional annual pension equal to 0.2% of that part of the Member's Average Annual Pensionable Earnings which does not exceed the Maximum Pensionable Earnings, multiplied by the number of years of Pensionable Employment before December 31, 2004 and reduced by $\frac{1}{4}$ of 1% for each month by which the date of retirement precedes the date Pensionable Age is reached.

The pension under this section A2.4 shall be converted into a pension level throughout retirement and computed on an Actuarial Equivalent basis. The resulting level pension of a Member, and its payment, shall be subject to Applicable Legislation, including any limitations on the lifetime amount payable as specified in section 5.5.

Any period of less than 12 months of Pensionable Employment shall be included on a proportionate basis.

- A2.5 All pensions shall be paid in accordance with section 8.1. In addition, for Members who retire in accordance with section A2.1 and have maintained Continuous Employment since December 31, 1986, a partial pension amount shall be paid for the period from the date of termination of employment to the date of retirement if the two dates are in the same month. This section A2.5 shall also apply to the benefits calculated in accordance with the provisions of sections 1 to 15 of the Plan.

SECTION A3 - DEATH BENEFITS

- A3.1 On the death of a Member prior to retirement, the surviving Spouse or, if there is no Spouse, the Beneficiary, shall receive the lump sum Actuarial Equivalent of the deferred pension calculated in accordance with section A2.4 to which the Member is entitled or would have been entitled if the Member had terminated employment on the date of death.

The benefit payable to the Spouse under this section A3.1 shall be paid in the form of a lump sum transfer to another registered pension plan (if that other plan permits), to a retirement savings plan of the prescribed kind, or to an insurance company for the purchase of an immediate or deferred life annuity, payable no later than as permitted under Applicable Legislation. The transfer under this paragraph shall be subject to any limitation prescribed by the Applicable Legislation related thereto.

The request for transfer must be provided in writing to the Employees' Benefit Committee within 90 days of the date of death.

Notwithstanding the above, and subject to section 9.2, on the death prior to retirement of a Member who has attained age 55, the surviving Spouse entitled to a lump sum in accordance with the preceding paragraphs, if any, may instead elect to receive a survivor pension that is the Actuarial Equivalent of this lump sum.

- A3.2 On the death prior to retirement of a Member who was entitled to retire under section A2.1 and who has maintained Continuous Employment since December 31, 1986, the Actuarial Equivalent reduction shall be made on the basis that the Fund will subsidize one-third of the pension to the surviving Spouse. This subsidy shall also apply to the benefits calculated in accordance with the provisions of sections 1 to 15 of the Plan.
- A3.3 Notwithstanding section A3.1, on the death of an Employee who has not attained age 55 but who has completed a Term of Employment of 30 or more years, who has maintained Continuous Employment since December 31, 1986 and who has a Spouse on the date of death, a survivor pension equal to 60% of the pension reduced in accordance with section A3.2 that the Member would have received if the Member had retired on the last day of the month during which death occurs shall be paid to the surviving Spouse for life. For this purpose, the pension shall be calculated as if the Member was age 55 and in accordance with section A2.4, with the exclusion of paragraph A2.4(a)(ii). The benefit provided under this section A3.3 shall be at least equivalent to the benefit provided under section A3.1.

- A3.4 If a Member has a Spouse on the date of retirement, the pension payable shall automatically be reduced on an Actuarial Equivalent basis so that such surviving Spouse shall be paid for life a pension equal to 60% of such reduced pension payable to the Member. If the Member retires in accordance with section A2.2 or A2.3 and has waived the life insurance coverage under the benefits program at retirement, if applicable, then the Actuarial Equivalent reduction shall be made on the basis that the Fund will subsidize one-third of the pension to the surviving Spouse.

Subject to the Spouse's written agreement in Prescribed Manner being deposited with the Employees' Benefit Committee prior to the date of retirement, the Member may elect to receive instead an unreduced pension payable for life.

In the event of divorce, annulment or separation, subject to the Spouse's written agreement in Prescribed Manner being deposited with the Employees' Benefit Committee, the amount of pension payable to the Retired Member shall be reinstated to the full amount from the first day of the month following the date the Spouse's agreement is provided to the Employees' Benefit Committee.

- A3.5 If the Member retires in accordance with section A2.1 and has maintained Continuous Employment since December 31, 1986,
- (a) and has no Spouse on the date of retirement or the Spouse has waived the right to the survivor pension, the Member may elect to receive a reduced pension that will continue for life in an amount equal to 60% of the reduced pension to a surviving father or mother named as beneficiary; this election shall be made in writing to the Employees' Benefit Committee prior to the date of retirement;
 - (b) and the eligible Spouse or parent beneficiary dies prior to the Retired Member, the amount of pension payable to the Retired Member shall be reinstated to the full amount from the first day of the month following the date of death of the eligible Spouse or parent beneficiary;
 - (c) the Actuarial Equivalent reduction shall be made on the basis that the Fund will subsidize one-third of the pension to the surviving Spouse or parent beneficiary. If the Member has waived the life insurance coverage under the benefits program at retirement, if applicable, the Actuarial Equivalent reduction shall be made on the basis that the Fund will subsidize two-thirds of the pension to the surviving Spouse or the parent beneficiary.

This section A3.5 shall also apply to the benefits calculated in accordance with the provisions of sections 1 to 15 of the Plan.

- A3.6 If a Member has no Spouse on the date of retirement or the Spouse's written agreement in Prescribed Manner has been deposited with the Employees' Benefit Committee prior to the date of retirement, the Member may elect to receive a pension reduced on an Actuarial Equivalent basis so that it is guaranteed to be payable for a minimum of 120 monthly payments.

The benefit payable to a Member's Beneficiary under a guarantee option may, if so requested by the Beneficiary, be paid in a lump sum Actuarial Equivalent of the remaining payments under the guarantee option.

In the event of the death of a designated Beneficiary who is in receipt of guaranteed payments under the Plan prior to the end of such guaranteed period, the balance of such payments shall be paid to the estate of the deceased Member in a lump sum Actuarial Equivalent of the remaining payments under the guarantee option.

SECTION A4 - TERMINATION BENEFITS

- A4.1 A Member whose employment terminates for any reason other than death or retirement shall be eligible for a deferred pension calculated in accordance with section A2.4. This deferred pension shall be payable for life and shall become due at the end of the month following the month during which the Member's 60th birthday is attained. If the Member has a spouse on the date the pension is due, this deferred pension shall be payable in accordance with section A3.4.
- A4.2 A Member entitled to a deferred pension under section A4.1 may elect to retire on the last day of any month after attainment of age 55 but not later than the last day of the month during which the Member's 60th birthday is attained. The Member shall then be granted an annual pension that is the Actuarial Equivalent of the deferred pension.

The annual pension payable under this section A4.2 shall not exceed the amount of deferred pension payable under section A4.1, and reduced by $\frac{1}{4}$ of 1% for each completed month by which the date of retirement precedes the earliest of age 60, 30 years of Term of Employment or the date on which the Member's age plus Term of Employment is equal to 80 assuming employment continues to such date.

APPENDIX B

SPECIAL PROVISIONS FOR

EMPLOYEES TRANSFERRED FROM OTHER PLANS

PURSUANT TO BUSINESS TRANSACTIONS

PREAMBLE TO APPENDIX B

The provisions of appendix B shall be read in conjunction with the provisions of sections 1 to 15 of the Plan and shall apply only to specific Employees whose pension rights were transferred from other plans pursuant to business transactions and not treated under Reciprocal Agreement.

The provisions of this appendix shall be read in conjunction with the other provisions of the Plan; however, in case of any inconsistency, the provisions of this appendix shall prevail.

**SECTION B1 - PROTECTION OF PENSION RIGHTS FOR FORMER EMPLOYEES OF
BELL COMMUNICATIONS SYSTEMS INC. (BCSI)**

- B1.1 Former employees of BCSI who became Employees of the Company as of January 1, 1987, provided that they maintain Continuous Employment, shall be entitled to the following:
- for their Pensionable Employment with BCSI and the Company prior to January 1, 1987: the benefits calculated in accordance with the provisions of appendix A.
 - for their Pensionable Employment on or after January 1, 1987: the larger of the benefits calculated in accordance with the provisions of sections 1 to 15 of the Plan or the benefits calculated in accordance with the provisions of appendix A.

**SECTION B2 - PROTECTION OF PENSION RIGHTS FOR FORMER EMPLOYEES OF
BELL TECHNICAL SERVICES INC.(BTS)**

B2.1. Former employees of BTS who became Employees of the Company on April 1, 1987, provided they were on the payroll of BTS on December 31, 1986, have previous service with Bell Canada and maintain Continuous Employment, shall be entitled to the following:

- for their Pensionable Employment with BTS and the Company prior to January 1, 1987: the benefits calculated in accordance with the provisions of appendix A.
- for their Pensionable Employment on or after January 1, 1987: the larger of the benefits calculated in accordance with the provisions of sections 1 to 15 of the Plan or the benefits calculated in accordance with the provisions of appendix A.

B2.2 In case of termination of employment, the Employee shall be entitled to benefits in respect of the employment with BTS in an amount at least equal to the Actuarial Equivalent of the deferred pension as defined under the rules of the Bell Data Systems pension plan in effect on March 31, 1987, based on the Employee's highest average compensation as of March 31, 1987.

**SECTION B3 - SPECIAL PROVISIONS FOR EMPLOYEES WHO WERE MEMBERS OF THE
BCE MOBILE COMMUNICATIONS INC. PENSION PLAN AS OF DECEMBER 31, 2000**

The provisions of this section shall apply only to Employees who were members of the BCE Mobile Communications Inc. Pension Plan as of December 31, 2000.

- B3.1 Employees who were members of the BCE Mobile Communications Inc. Pension Plan as of December 31, 2000 shall be entitled to the benefits calculated in accordance with the provisions of sections 1 to 15 of the Plan for their entire period of Pensionable Employment.

Notwithstanding the above, Employees who were Qualified Members as defined under the rules of the BCE Mobile Communications Inc. Pension Plan in effect on December 31, 2000, shall be entitled, for their Pensionable Employment on or after January 1, 1987, to the larger of the benefits calculated in accordance with the provisions of sections 1 to 15 of the Plan or the benefits calculated in accordance with the provision of appendix A and, for their Pensionable Employment prior to January 1, 1987, to the benefits calculated in accordance with the provisions of appendix A.

In no event will the benefits payable to an Employee who was a member of the BCE Mobile Communications Inc. Pension Plan prior to January 1, 2001 be less than the benefits accrued under such plan prior to such date.

- B3.2 For Employees who were members of the BCE Mobile Communications Inc. Pension Plan as of December 31, 2000, who were Members of the Plan at any time prior to January 1, 1987 and who were transferred to National Mobile Radio Communications Inc. at Bell Canada's request before August 1, 1987, the reduction in pension under section 5.3 of the Plan cannot exceed 10%. In any event, such reduction shall not be less than the minimum reduction prescribed under the Applicable Legislation.

**SECTION B4 - SPECIAL PROVISIONS FOR UNIONIZED EMPLOYEES OF
NORTEL NETWORKS CORPORATION TRANSFERRED TO
EXPERTECH NETWORK INSTALLATIONS INC. AS OF MAY 26, 2000**

The provisions of this section shall apply only to Employees who were unionized employees of Nortel Networks Corporation ("Nortel") and who were transferred to Expertech Networks Installations Inc. ("Expertech") effective May 26, 2000 (the "Nortel Transferees"), pursuant to the Asset Purchase Agreement dated April 28, 2000 (the "Asset Purchase Agreement"). As a result of the foregoing transfers, and subject to regulatory approval of the pension asset transfer provided under the Asset Purchase Agreement, the rights and benefits of the Nortel Transferees under the Plan shall be determined as follows:

- B4.1 The benefits payable under the Plan to Nortel Transferees shall be determined and calculated in accordance with the provisions of the Plan. The years of employment of such Employees with Nortel prior to May 26, 2000 shall
- (i) constitute years of Continuous Employment under the Plan and will be considered for purposes of eligibility to the benefits,
 - (ii) be recognized in their Term of Employment, and
 - (iii) be considered as years of Pensionable Employment under the Plan.

Notwithstanding the preceding paragraph, the benefits payable under the Plan to Nortel Transferees, with respect to their years of employment with Nortel prior to May 26, 2000, shall not be less than the benefits they would have been entitled to if their benefits for such years of employment had been determined and calculated in accordance with the provisions of the Nortel Networks Negotiated Pension Plan in effect on May 26, 2000.

**SECTION B5 - SPECIAL PROVISIONS FOR EMPLOYEES TRANSFERRED FROM CERTEN INC.
PURSUANT TO THE TRANSITION AGREEMENT DATED MAY 28, 2003**

The provisions of this section shall apply only to Employees who were employees of Certen Inc. and who were transferred to Bell Canada (the "Certen Transferees") pursuant to the Transition Agreement dated May 28, 2003 (the "Transition Agreement"). As a result of the foregoing transfers, and subject to regulatory approval of the pension asset transfer provided under the Transition Agreement, the rights and benefits under the Plan of the Certen Transferees who started employment with Bell Canada as of July 1, 2003 or thereafter (the "Transfer Date") shall be determined as follows:

- B5.1 Employees who were members of the Certen Inc. Pension Plan prior to their Transfer Date are eligible to participate in the Plan as of their Transfer Date. Employees who were hired by Certen Inc. on or after April 1, 2001 and who were not members of the Certen Inc. Pension Plan prior to their Transfer Date are eligible to participate in the Plan on the date they satisfy the eligibility requirements provided under the Plan, their years of employment with Certen Inc. being recognized in their Term of Employment.
- B5.2 The years of employment with Certen Inc. and the years of prior employment with Bell Canada, as applicable, shall
- (i) constitute years of Continuous Employment under the Plan and will be considered for purposes of eligibility to the benefits,
 - (ii) be recognized in the Term of Employment, and
 - (iii) be considered as years of Pensionable Employment under the Plan.
- B5.3 For greater certainty, all benefits accrued under the Certen Inc. Pension Plan by an Employee who was employed in Quebec prior to his or her Transfer Date, in respect of his or her years of employment with Certen Inc., are fully vested under the Plan as of the Transfer Date.

APPENDIX C

**SPECIAL PROVISIONS
FOR ELIGIBLE EMPLOYEES UNDER
THE PAY EQUITY SETTLEMENT AGREEMENTS**

PREAMBLE TO APPENDIX C

The provisions of appendix C shall apply only to Eligible Employees under the terms of the Settlement Agreement entered into between the Canadian Telecommunications Employees' Association and Bell Canada on August 30, 2002 and to employees of Bell Canada who held excluded non-management positions and who were awarded the same treatment, and to Eligible Employees under the terms of the Settlement Agreement entered into between Communications, Energy and Paperworkers Union of Canada and Femmes Action and Bell Canada on December 5, 2005 and ratified on June 19, 2006.

The provisions of this appendix shall be read in conjunction with the other provisions of the Plan; however, in case of any inconsistency, the provisions of this appendix shall prevail.

SECTION C1 - DEFINITIONS

Unless the context or the definitions under the following paragraphs of this section clearly indicate otherwise, the terms shall have the meanings as specified in section 1 of the Plan.

"2002 Settlement Agreement" means the Settlement Agreement entered into between the Canadian Telecommunications Employees' Association and Bell Canada on August 30, 2002.

"2006 Settlement Agreement" means the Settlement Agreement entered into between Communications, Energy and Paperworkers Union of Canada and Femmes Action and Bell Canada on December 5, 2005 and ratified on June 19, 2006.

"Average Annual Pensionable Earnings" means the Average Annual Pensionable Earnings defined in section 1.3, and:

- i) in the case of a former Employee of the Company at the time of the Pay Equity Settlement Payment, adjusted to include the Pay Equity Pensionable Settlement Payment for the month immediately preceding termination of employment from the Company;
- ii) in the case of an active Eligible Employee other than a Pay Equity DC Member, adjusted to include the Pay Equity Settlement Payment for the month in which the Pay Equity Settlement Payment is received; or
- iii) in the case of a Pay Equity DC Member, not including the Pay Equity Settlement Payment.

"Eligible Employee" means a current or former employee of the Company who is entitled to a Pay Equity Settlement Payment.

"Pay Equity DC Account" means the aggregate of the Pay Equity DC Contributions plus Investment Earnings thereon, in respect of a Pay Equity DC Member.

"Pay Equity DC Contributions" means the contributions deposited in the Pay Equity DC Account in respect of a Pay Equity DC Member.

"Pay Equity DC Member" means an active Eligible Employee currently participating in the DB Provisions who has elected to participate in the Pay Equity DC Portion of the Plan in relation with the Pay Equity Pensionable Settlement Payment or an active Eligible Employee currently participating in the DC Provisions.

"Pay Equity DC Portion" means the DC portion of the Plan set forth in this appendix.

"Investment Earnings" means the Pension Fund's rate of return, as published monthly. The method used for calculating and allocating Investment Earnings shall be determined by the Employees' Benefit Committee.

"Pay Equity Settlement Payment" means the amount or amounts received under the Settlement Agreements.

“Pay Equity Pensionable Settlement Payment” means:

- i) 100% of the Pay Equity Settlement Payment under the 2002 Settlement Agreement, or
- ii) 82% of the Pay Equity Settlement Payment under the 2006 Settlement Agreement excluding:
 - pain and suffering damages, and
 - lump sum of \$1,000 for Employees with less than one year of service covered by the settlement.

SECTION C2 - ADDITIONAL PENSIONS

The pension payable to a former Employee of the Company who is a Retired Member or a deferred pensioner and who is entitled to a Pay Equity Pensionable Settlement Payment, or the pension payable to the surviving Spouse of such former Employee, shall be recalculated as of the Member's retirement date using the Average Annual Pensionable Earnings as defined in this appendix. The resulting increase in pension, if any, including any adjustments made pursuant to the provisions of section 8 of the Plan, shall become payable from the last day of the month following the month during which the Pay Equity Settlement Payment is made or from the Member's retirement date for deferred pensioner.

In addition, the cumulative amount of retroactive monthly pension adjustments shall be paid as a lump sum to a Retired Member, a surviving Spouse or the legal heirs of a deceased Retired Member or surviving Spouse.

For greater certainty, no pension adjustment is made with respect to an Eligible Employee who has not retired and who has no rights under the Plan at the time of the Pay Equity Pensionable Settlement Payment.

SECTION C3 – PAY EQUITY DEFINED CONTRIBUTION PORTION

The benefits provided under the Pay Equity DC Portion shall be in addition to any benefits provided under the defined benefit provisions of the Plan. Furthermore, the transfers under this section C3 shall be subject to any limitations prescribed by the Applicable Legislation in respect of the transfer of monies from the Fund.

a) Contributions

On the first day of the month following the Pay Equity Settlement Payment to an active Eligible Employee who has elected to participate under the Pay Equity DC Portion of the Plan, a Pay Equity DC Contribution shall be deposited in the Pay Equity DC Account of the Pay Equity DC Member.

Under the 2002 Settlement Agreement, the Pay Equity DC Contribution shall be determined in accordance with schedule C.

Under the 2006 Settlement Agreement, the Pay Equity DC Contribution shall be determined as the Actuarial Equivalent value of the additional pension benefits that would have been payable upon termination as of December 31, 2005 with the Average Annual Pensionable Earnings under the DB Provisions adjusted to include the Pay Equity Pensionable Settlement Payment.

The Pay Equity DC Contribution in any calendar year in respect of a Pay Equity DC Member shall not exceed the amount of contributions permissible under the Income Tax Act (Canada), after appropriate recognition of any pension credit accrued by the Pay Equity DC Member in respect of such calendar year under the provisions of the Plan. The balance of any Pay Equity DC Contribution that cannot be credited in a given year shall be credited on January 1st of the following year, subject to the applicable limitations.

b) Valuation of Pay Equity DC Account

The Pay Equity DC Account of a Pay Equity DC Member shall be valued at the end of each month, at which time Investment Earnings shall be allocated to the account.

c) Retirement Benefits

A Pay Equity DC Member who retires after having attained age 55 shall receive the balance of the Pay Equity DC Account in the form of a lump sum transfer to another registered pension plan, to a retirement savings plan of the prescribed kind, or to an insurance company for the purchase of an immediate or deferred life annuity, payable no later than as permitted under Applicable Legislation.

d) Death Benefits

If a Pay Equity DC Member dies prior to the payment or transfer of the Pay Equity DC Account in accordance with this appendix, the Member's Spouse, if any, shall receive the balance of the Pay Equity DC Account in the form of a lump sum transfer to another registered pension plan, to a retirement savings plan of the prescribed kind, or to an insurance company for the purchase of an immediate or deferred life annuity, payable no later than as permitted under Applicable Legislation.

e) Termination Benefits

Subject to the following paragraph, a Pay Equity DC Member whose employment terminates for any reason other than death or retirement shall receive the balance of the Pay Equity DC Account in the form of a lump sum transfer to another registered pension plan, to a retirement savings plan of the prescribed kind, or to an insurance company for the purchase of an immediate or deferred life annuity, payable no later than as permitted under Applicable Legislation.

A Pay Equity DC Member who is entitled to a transfer in accordance with the preceding paragraph, and who does not elect the portability of defined benefits as per section 9 of the Plan shall leave the Pay Equity DC Account in the Plan in lieu of the immediate transfer. In this case, the Pay Equity DC Member shall receive, at retirement date, the balance of the Pay Equity DC Account in the form of the lump sum transfer specified above.

f) Transfer of Employment

If a Pay Equity DC Member is transferred under a Reciprocal Agreement to another legal entity, the Pay Equity DC Member shall leave the Pay Equity DC Account in the Plan; in such case, the entitlement of the Pay Equity DC Member to the subsequent transfer of the Pay Equity DC Account shall be determined in accordance with section 3(e) of this appendix on the date the Pay Equity DC Member is no longer employed with the Company, any Participating Company or any legal entity which is associated with the Company or a Participating Company.

SCHEDULE C

PAY EQUITY DC CONTRIBUTION

(UNDER APPENDIX C)

SCHEDULE C

DEFINED CONTRIBUTION PERCENTAGE (Applicable to Pay Equity Settlement Amount)

Age	Completed Years of Pensionable Employment															
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
18	1%	1%														
19	1%	1%	1%													
20	1%	1%	1%	1%												
21	1%	1%	1%	1%	2%											
22	1%	1%	1%	1%	2%	2%										
23	1%	1%	1%	1%	2%	2%	3%									
24	1%	1%	1%	1%	2%	2%	3%	4%								
25	1%	1%	1%	1%	2%	2%	3%	4%	5%							
26	1%	1%	1%	1%	2%	2%	3%	4%	5%	6%						
27	1%	1%	1%	1%	2%	2%	3%	4%	5%	6%	7%					
28	1%	1%	1%	1%	2%	2%	3%	4%	5%	6%	7%	8%				
29	1%	1%	1%	1%	2%	2%	3%	4%	5%	6%	7%	8%	9%			
30	1%	1%	1%	1%	2%	2%	3%	4%	5%	6%	7%	8%	9%	10%		
31	1%	1%	1%	1%	2%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	
32	1%	1%	1%	1%	2%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%
33	1%	1%	1%	1%	2%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%
34	1%	1%	1%	1%	2%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%
35	1%	1%	1%	1%	2%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%
36	1%	1%	1%	1%	2%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%
37	1%	1%	1%	1%	2%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%
38	1%	1%	1%	1%	2%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%
39	1%	1%	1%	1%	2%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%
40	1%	1%	1%	1%	2%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%
41	1%	1%	1%	1%	2%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%
42	1%	1%	1%	1%	2%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%
43	1%	1%	1%	1%	2%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%
44	1%	1%	1%	1%	2%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%
45	1%	1%	1%	1%	2%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%
46	1%	1%	1%	1%	2%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%
47	1%	1%	1%	1%	2%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%
48	1%	1%	1%	1%	2%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%
49	1%	1%	1%	1%	2%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%
50	1%	1%	1%	1%	2%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%
51	1%	1%	1%	1%	2%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%
52	1%	1%	1%	1%	2%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%
53	1%	1%	1%	1%	2%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%
54	1%	1%	1%	1%	2%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%
55	1%	1%	1%	1%	2%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%
56	1%	1%	1%	1%	2%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%
57	1%	1%	1%	1%	2%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%
58	1%	1%	1%	1%	2%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%
59	1%	1%	1%	1%	2%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%
60	1%	1%	1%	1%	2%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%
61	1%	1%	1%	1%	2%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%
62	1%	1%	1%	1%	2%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%
63	1%	1%	1%	1%	2%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%
64	1%	1%	1%	1%	2%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%
65	1%	1%	1%	1%	2%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%

SCHEDULE C

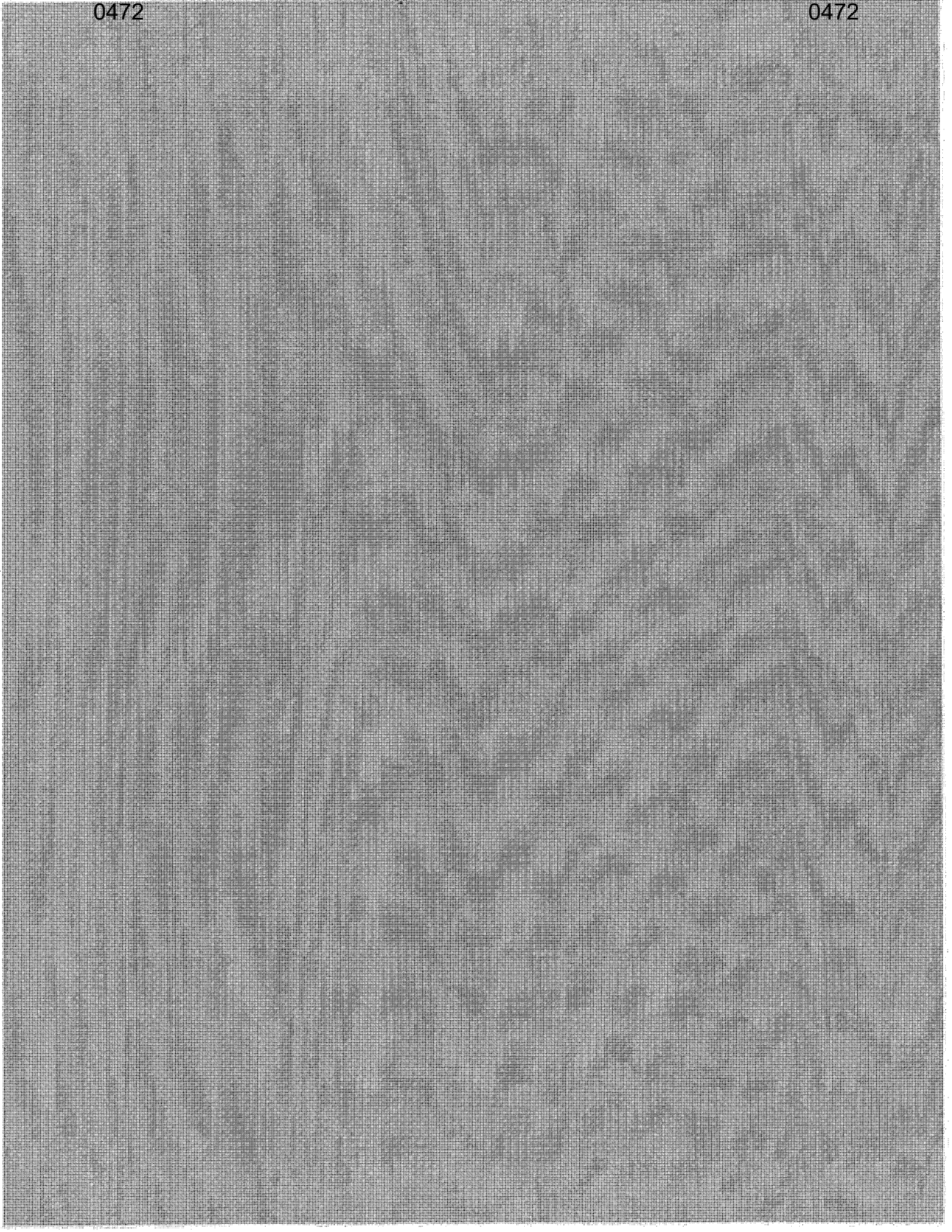
DEFINED CONTRIBUTION PERCENTAGE (Applicable to Pay Equity Settlement Amount)

Age	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
18															
19															
20															
21				19%											
22			17%	20%											
23		15%	18%	21%											
24		16%	19%	22%											
25		17%	20%	23%											
26		18%	21%	24%											
27		19%	22%	25%											
28		20%	23%	26%											
29		21%	24%	27%											
30		22%	25%	28%											
31		23%	26%	29%											
32	13%	24%	27%	30%											
33	14%	25%	28%	31%											
34	15%	26%	29%	32%											
35	16%	27%	30%	33%											
36	17%	28%	31%	34%											
37	18%	29%	32%	35%											
38	19%	30%	33%	36%											
39	20%	31%	34%	37%											
40	21%	32%	35%	38%											
41	22%	33%	36%	39%											
42	24%	34%	37%	40%											
43	25%	35%	38%	41%											
44	27%	36%	39%	42%											
45	28%	37%	40%	43%											
46	30%	38%	41%	44%											
47	32%	39%	42%	45%											
48	34%	40%	43%	46%											
49	36%	41%	44%	47%											
50	38%	42%	45%	48%											
51	40%	43%	46%	49%											
52	43%	45%	48%	50%											
53	45%	48%	51%	53%											
54	48%	51%	54%	56%											
55	51%	54%	57%	59%											
56	54%	58%	61%	63%											
57	57%	61%	65%	68%											
58	61%	65%	69%	72%											
59	65%	69%	73%	76%											
60	69%	73%	77%	80%											
61	69%	73%	77%	82%											
62	69%	73%	77%	82%											
63	69%	73%	77%	82%											
64	69%	73%	77%	82%											
65	69%	73%	77%	82%											

SCHEDULE C

DEFINED CONTRIBUTION PERCENTAGE (Applicable to Pay Equity Settlement Amount)

Age	Completed Years of Pensionable Employment	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
18																
19																
20																
21																
22																
23																
24																
25																
26																
27																
28																
29																
30																
31																
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35																
36																
37																
38																
39																
40																
41																
42																
43																
44																
45																
46																
47		62%														
48		65%														
49		69%	74%													
50		73%	78%	81%												
51		78%	83%	86%	88%											
52		83%	85%	88%	91%	88%										
53		88%	91%	93%	96%	99%	96%									
54		93%	96%	99%	102%	105%	102%	105%								
55		99%	102%	105%	108%	112%	115%	118%	114%							
56		105%	108%	112%	115%	118%	122%	125%	129%	124%						
57		111%	115%	119%	122%	126%	129%	133%	137%	140%	135%					
58		118%	122%	126%	130%	133%	137%	141%	145%	149%	153%	147%				
59		126%	130%	134%	138%	142%	146%	150%	154%	158%	162%	166%	160%			174%
60		133%	138%	142%	146%	150%	155%	159%	163%	168%	172%	176%	181%	185%		189%
61		133%	138%	142%	146%	150%	155%	159%	163%	168%	172%	176%	181%	185%	189%	189%
62		133%	138%	142%	146%	150%	155%	159%	163%	168%	172%	176%	181%	185%	189%	189%
63		133%	138%	142%	146%	150%	155%	159%	163%	168%	172%	176%	181%	185%	189%	189%
64		133%	138%	142%	146%	150%	155%	159%	163%	168%	172%	176%	181%	185%	189%	189%
65		133%	138%	142%	146%	150%	155%	159%	163%	168%	172%	176%	181%	185%	189%	189%



Revised Amendment No. 20 to the Bell Canada Pension Plan

Effective July 1, 2012, the Bell Canada Pension Plan is amended as follows:

- 1. By adding the following paragraphs to both section 6.6 and section A3.7:*

The benefit payable to a Member's Beneficiary under a guarantee option may, if so requested by the Beneficiary, be paid in a lump sum Actuarial Equivalent of the remaining payments under the guarantee option.

In the event of the death of a designated Beneficiary who is in receipt of guaranteed payments under the Plan prior to the end of such guaranteed period, the balance of such payments shall be paid to the estate of the deceased Member in a lump sum Actuarial Equivalent of the remaining payments under the guarantee option.

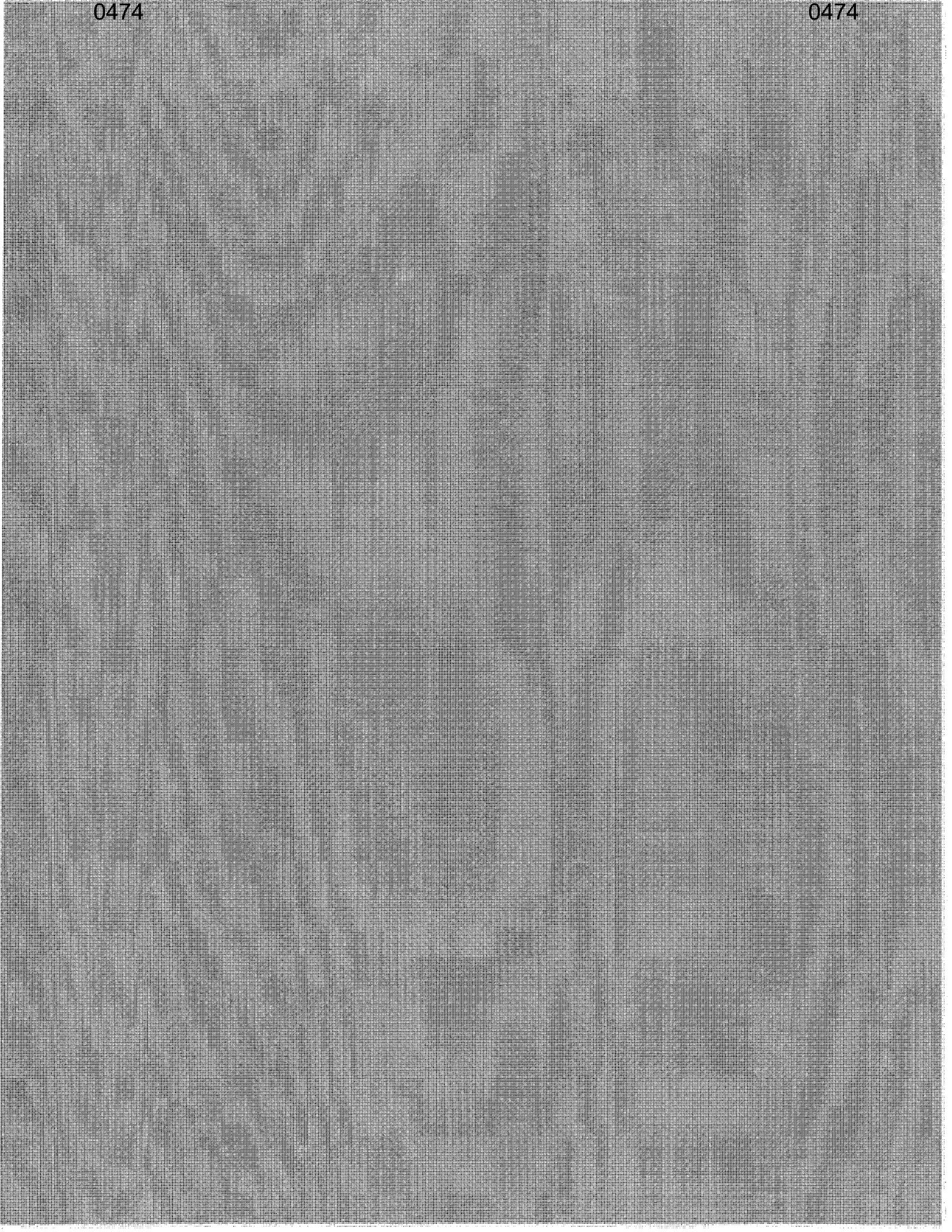
- 2. By replacing sections 9.2 and 9.3 by the following:*

9.2 Notwithstanding section 9.1, where the sum of the DC Member Account and the lump sum Actuarial Equivalent of the benefits payable under the DB Provisions is less than 20% of the Maximum Pensionable Earnings for the year the Member terminates employment, retires or dies, or such other limit as may be prescribed under the Applicable Legislation, the aggregate value of the DC Member Account and the lump sum Actuarial Equivalent of the benefits payable under the DB Provisions will be paid in cash to the Member or the surviving Spouse.

- 3. By removing sections 6.4 and A3.2.*

- 4. By adding the following paragraph to both section 6.3 and section A3.1:*

Notwithstanding the above and subject to section 9.2, on the death prior to retirement of a Member who has attained age 55, the surviving Spouse entitled to a lump sum in accordance with the preceding paragraphs, if any, may instead elect to receive a survivor pension that is the Actuarial Equivalent of this lump sum.



Amendment No. 21 to the Bell Canada Pension Plan

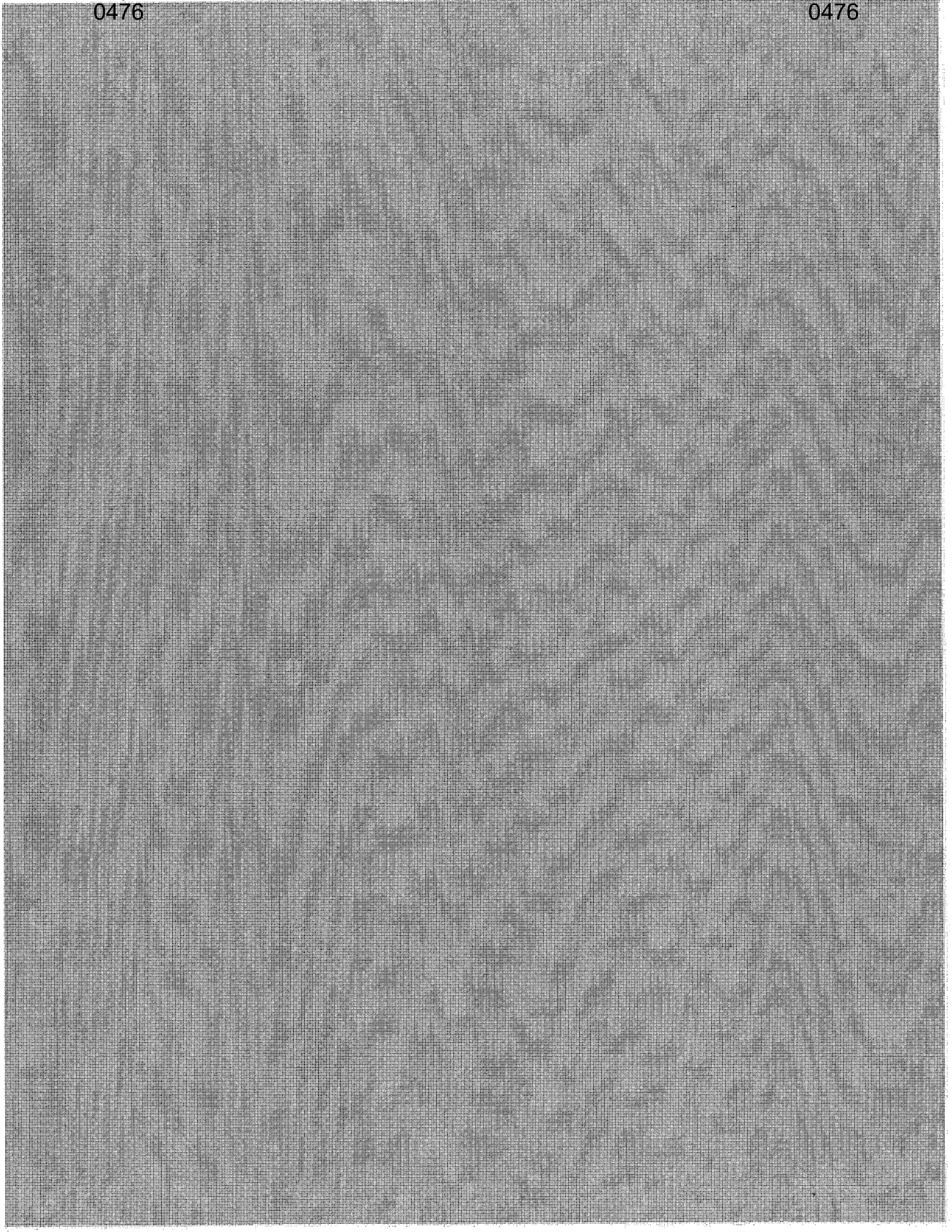
Effective July 5, 2013, the Bell Canada Pension Plan is amended as follows:

1. By replacing section 3.1 by the following:

All Employees shall become Members of the Plan after they have completed a Term of Employment of 24 months, except for Employees who, because of their religious beliefs, object to becoming Members of the Plan or for Employees of a Participating Company, if they are accruing benefits under another pension plan sponsored by that Participating Company.

2. By replacing section 3.2 by the following:

Notwithstanding section 3.1, Employees hired on or after October 1, 2004 shall become DC Members of the Plan after they have completed a Term of Employment of 3 months, unless otherwise provided under the applicable collective agreement provisions or rules of the Company or the relevant Participating Company and except for Employees who, because of their religious beliefs, object to becoming Members of the Plan or for Employees of a Participating Company, if they are accruing benefits under another pension plan sponsored by that Participating Company. An Employee who becomes a DC Member in accordance with this section 3.2 shall not accrue Pensionable Employment under the DB Provisions.



Amendment No. 22 to the Bell Canada Pension Plan

Effective January 1, 2014, the Bell Canada Pension Plan is amended as follows:

1. *By replacing section 1.18 by the following:*

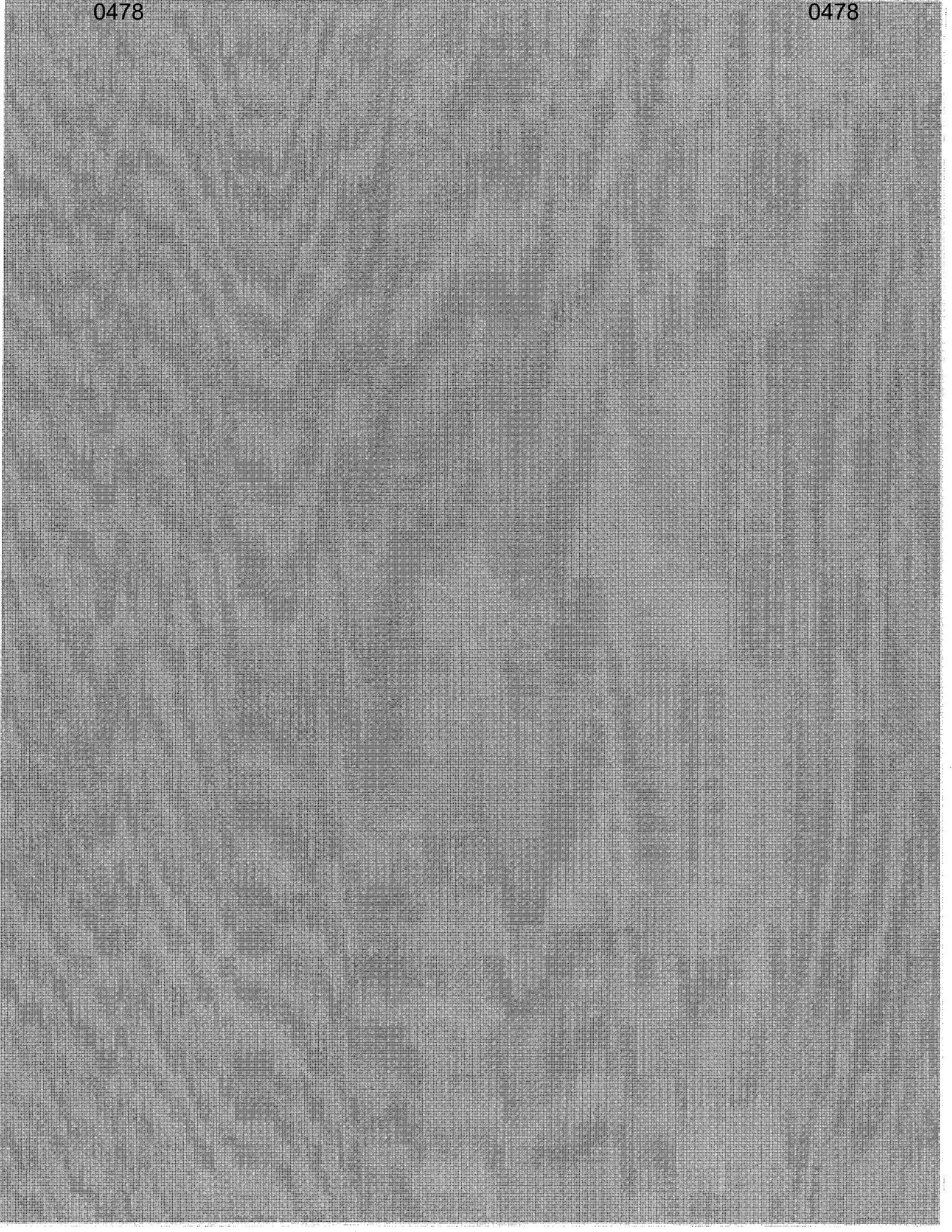
"Employee" means, prior to January 1, 2014, a person who receives a regular and stated DB or DC Compensation, as applicable, from the Company or one of the Participating Companies, other than a pension or retainer. Effective January 1, 2014, "Employee" means a person who receives DB or DC Compensation, as applicable, from the Company or one of the Participating Companies, other than a pension or retainer;

2. *By replacing section 3.2 by the following:*

Notwithstanding section 3.1, Employees hired on or after October 1, 2004 shall become DC Members of the Plan, unless otherwise provided under the applicable collective agreement provisions or rules of the Company or the relevant Participating Company and except for Employees who, because of their religious beliefs, object to becoming Members of the Plan or for Employees of a Participating Company, if they are accruing benefits under another pension plan sponsored by that Participating Company, on:

- (i) the day of completion of a Term of Employment of 3 months in the case of Employees receiving a regular and stated DC Compensation from the Company or one of the Participating Companies (for greater certainty not including Employee acting in a freelance capacity); or
- (ii) the first day of January coincident with or next following the date on which Employees have earned, in respect of employment with the Company or one of the Participating Companies, at least 35% of the Maximum Pensionable Earnings in two consecutive calendar years in all other cases (for greater certainty including Employee acting in a freelance capacity).

An Employee who becomes a DC Member in accordance with this section 3.2 shall not accrue Pensionable Employment under the DB Provisions.



Amendment No. 23 to the Bell Canada Pension Plan

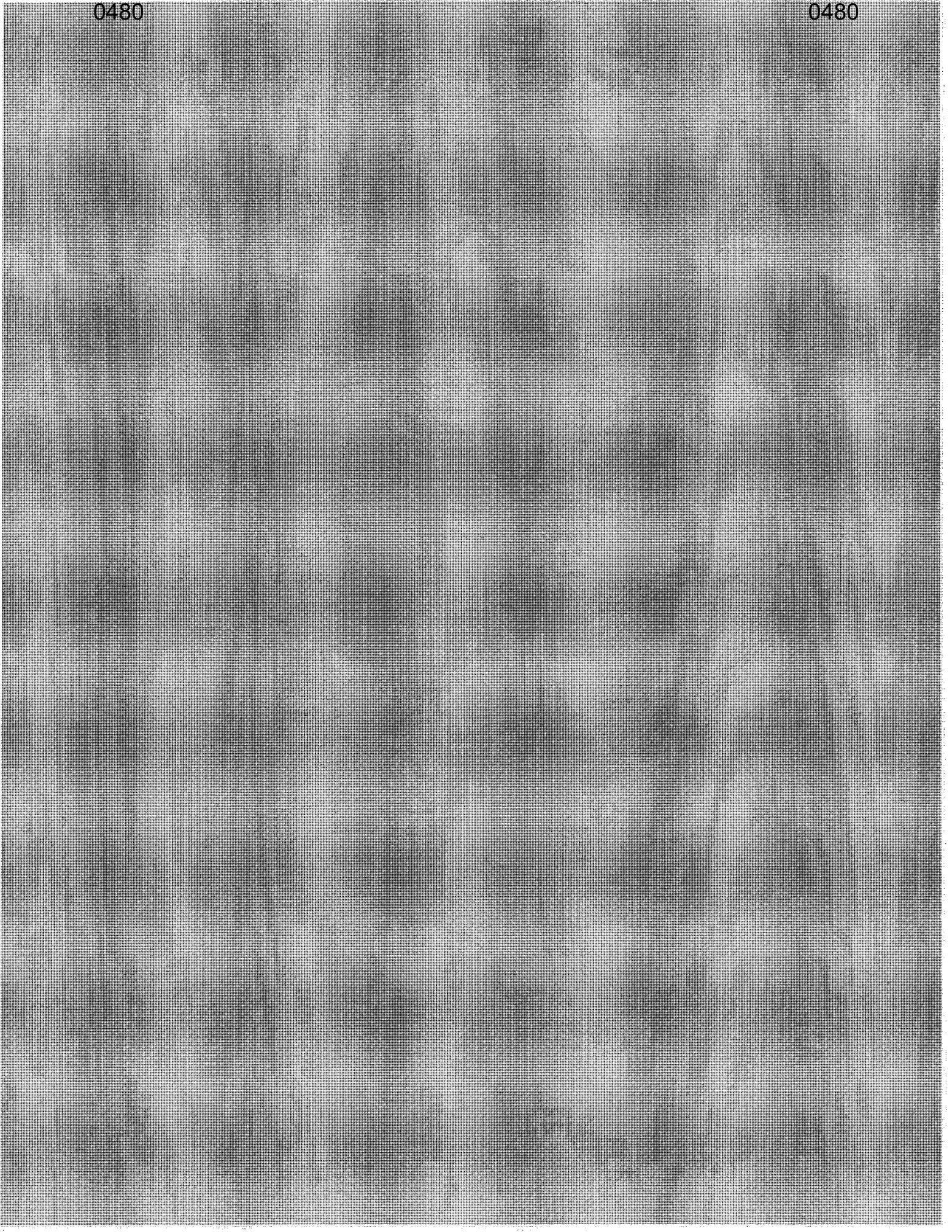
Effective December 31, 2014, the Bell Canada Pension Plan is amended as follows:

1. *By adding the following section B6 at the end of the appendix B:*

SECTION B6 - SPECIAL PROVISIONS FOR MEMBERS AND EMPLOYEES ELIGIBLE TO THE BELL ALIANT PENSION PLAN (ONTARIO AND QUEBEC) TRANSFERRED TO THE PLAN AS OF DECEMBER 31, 2014

The provisions of this section shall apply only to employees who were members or who were eligible to become members of the Bell Aliant Pension Plan (Ontario and Quebec) and who were transferred to the Bell Canada Pension Plan (the "Bell Aliant Transferees") as of December 31, 2014. As a result of the foregoing transfers, and subject to regulatory approval of the pension asset transfer, the rights and benefits under the Plan of the Bell Aliant Transferees shall be determined as follows:

- B6.1 Bell Aliant Transferees who were members of the Bell Aliant Pension Plan (Ontario and Quebec) prior to the effective transfer date are eligible to participate in the Plan as of December 31, 2014. Bell Aliant Transferees who were not members of the Bell Aliant Pension Plan (Ontario and Quebec) prior to December 31, 2014 are eligible to participate in the Plan on the date they satisfy the eligibility requirements provided under the Plan.
- B6.2 "Continuous Employment", "Term of Employment", "Pensionable Employment" and "DB Compensation" as determined and recognized for Bell Aliant Transferees under the Bell Aliant Pension Plan (Ontario and Quebec) shall respectively be recognized as Continuous Employment, Term of Employment, Pensionable Employment and DB Compensation under the Plan.



Amendment No. 24 to the Bell Canada Pension Plan

Effective December 31, 2015, the Bell Canada Pension Plan is amended as follows:

1. *By replacing the section 4.1 by the following:*

In each calendar year or portion thereof, a DC Member may elect to make DC Member Contributions, subject to section 4.6. Such DC Member Contributions shall be equal to 0%, 1% or 2% of the DC Compensation, as elected by the DC Member. The DC Member may elect to change the contribution rate as permitted under the applicable rules of the Company or the relevant Participating Company. In the absence of such instruction from the DC Member after two years of membership, a default contribution of 2% may be set by the Company.

2. *By replacing the section 4.2 by the following:*


In each calendar year or portion thereof, a DC Member who makes DC Member Contributions equal to 2% of the DC Compensation may elect to make DC Member Additional Contributions, subject to section 4.6. Such DC Member Additional Contributions shall be equal to full integers from 0% to 10% of the DC Compensation, as elected by the DC Member. The DC Member may elect to change the contribution rate as permitted under the applicable rules of the Company or the relevant Participating Company.

3. *By replacing the subsection 5.1(ii) and 7.1(ii) by the following:*

(ii) the balance of the DC Member Additional Account in the form of a lump sum transfer in Prescribed Manner under the Applicable Legislation.

4. *By replacing "1.34" by "1.35" in section 8.5.*
5. *By replacing "cash" by "Prescribed Manner under the Applicable Legislation" in section 9.2.*
6. *By deleting the word "active" in section 15.2.*

*THIS IS EXHIBIT "D" REFERRED TO IN THE
AFFIDAVIT OF JASMINE RANDHAWA
SWORN BEFORE ME, THIS 25 DAY OF JULY, 2018*



A COMMISSIONER FOR TAKING AFFIDAVITS, ETC.

Brittany Tovee



BELL CANADA PENSION PLAN

**ACTUARIAL VALUATION
AS AT DECEMBER 31, 2016**

**OSFI Registration #55077
Canada Revenue Agency Registration #0222075**

**Robert Marchessault, F.C.I.A., F.S.A.
Stéphan Cliche, F.C.I.A., F.S.A.
Joël Lépine, F.C.I.A., F.S.A.
Pierre-Luc Héon**

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Tour A5
Verdun (Québec)
H3E 3B3**

June 2017

**Bell Canada Pension Plan
Actuarial Valuation as at December 31, 2016**

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I – INTRODUCTION

This report has been prepared for Bell Canada and presents the results of the actuarial valuation of the Bell Canada Pension Plan (referred to as the “Plan”) as at December 31, 2016. The Plan is governed by the Pension Benefits Standards Act, 1985 and the related Regulations (referred to as the “PBSA”). The Plan consists of a defined benefit component (“DB Component”) and a defined contribution component (“DC Component”). The last actuarial valuation of the Plan filed with the government authorities was conducted as at December 31, 2015 in accordance with the PBSA.

Since the previous valuation, no changes have been made to the plan provisions or to the actuarial methods.

The actuarial assumptions used for the purposes of this valuation are different from those used for the previous valuation to adjust to prevailing market conditions and long-term economic and demographic expectations as at the current valuation date and revised Statement of Investment Policies and Procedures (“SIPP”) investment strategy, with specific asset mix for the retirees and active members. It also reflects Bell Canada’s terms of engagement regarding margins for adverse deviation in the going-concern discount rate and regarding valuation of solvency liabilities, with benefits expected to be settled by a purchase of annuities valued based on a replicating portfolio approach, as described in the Canadian Institute of Actuaries’ (“CIA”) Educational Note on *Alternative Settlement Methods for Hypothetical Wind-Up and Solvency Valuations*. This methodology along with the assumptions used are outlined in Appendix D.

Since the previous valuation, the following events have had an impact on membership:

- On October 1, 2016, managers of the Bell Aliant Defined Contribution Plan were transferred to the DC Component of the Plan. Their DC accounts were transferred to the Plan on November 25, 2016.
- On December 31, 2016, O.N. Tel Inc. (“ONTERA”) was amalgamated into NorthernTel, a participating company in the Régime de retraite de Télébec ltée (“Telebec Plan”), and employees were transferred from the DC Component of the Plan to DC Component of the Telebec Plan. The balance of their DC accounts is yet to be transferred as at December 31, 2016. As a result of this amalgamation, ONTERA is no longer a participating company in the Plan.

As indicated in the last actuarial valuation report, the Plan had unused advance contributions of \$218.6 million as at December 31, 2015, which were totally used to cover a portion of the 2016 minimum required amortization payments. In December 2016, Bell Canada contributed to the Plan the balance of the 2016 minimum required amortization payments (\$1.9 million) and also contributed \$348.1 million over and above that minimum funding requirements. As such, unused advance contributions as at December 31, 2016 are \$348.1 million.

As at the valuation date, the following companies participate in the Plan:

- Bell Canada (referred to as “BELL”);
- Expertech Network Installation Inc. (referred to as “EXPERTECH”);
- Bell Mobility Inc. (referred to as “MOBILITY”);
- Bell TV (referred to as “BELL TV”); and
- Bell Media (referred to as “MEDIA”).

I – Introduction (cont'd)

The purposes of the report are:

- to present information on the financial position of the Plan;
- to review the solvency of the Plan;
- to determine the minimum and maximum funding requirements for 2017; and
- to provide the information and actuarial opinion required by the Office of the Superintendent of Financial Institutions (“OSFI”) and the Canada Revenue Agency.

Here are the highlights of this valuation:

- as at December 31, 2016, for the DB Component, the actuarial value of assets of the Plan, excluding unused advance contributions, is \$15,000.6 million and the going-concern actuarial liability is \$14,541.0 million. The going-concern actuarial surplus is estimated at \$459.6 million;
- as at December 31, 2016, for the DC Component, the actuarial value of assets of the Plan is equal to the liabilities of the Plan of \$998.4 million;
- the aggregate Employer normal actuarial cost for 2017 is estimated at \$200.5 million (\$113.8 million for the DB Component and \$86.7 million for the DC Component) or 8.5% of the estimated aggregate Pensionable Earnings of \$2,364.8 million;
- as at December 31, 2016, the Plan has a solvency ratio of 95.7%, an average solvency ratio of 93.9%, a solvency shortfall of \$692.1 million and a solvency deficiency of \$987.7 million; and
- amortization payments are required to liquidate the solvency deficiency. The minimum amortization payments for 2017 are \$197.5 million.

The directives of the Superintendent require that pension plans with solvency ratios of less than 1.20 file annual valuation reports. As such, the actuarial opinion contained in this report is only valid for 2017 and the next valuation report must have a valuation date no later than December 31, 2017.

To our knowledge, there has been no specific event subsequent to the valuation date which would have a material impact on the results shown in this report.

II – VALUATION RESULTS

ASSETS

The assets of the DB Component of the Bell Plan are mainly invested in units of the BCE Master Trust Fund, while the assets of the DC Component of the Plan are invested in pooled funds. For the purposes of the valuation, we have used the information contained in the annual financial statements of the Plan as at December 31, 2016, audited by Deloitte LLP, as well as the monthly financial statements issued by RBC Investor and Treasury Services, adjusted for pending individual transfers under reciprocal agreements.

The actuarial value of assets has been calculated using a method that recognizes market values but amortizes market value fluctuations of public equities of the DB Component over four years.

<i>(in millions)</i>	December 31, 2016	December 31, 2015
<u>DB Component</u>		
Market Value of Assets		
Including unused advance contributions	\$15,515.5	\$15,225.3
Excluding unused advance contributions	\$15,167.4	\$15,006.7
Actuarial Value of Assets		
Including unused advance contributions	\$15,344.8	\$14,768.5
Excluding unused advance contributions	\$15,000.6	\$14,556.5
Ratio of Actuarial Value to Market Value	98.9%	97.0%
<u>DC Component</u>		
Market/Actuarial Value of Assets	\$998.4	\$740.0

The development of asset values for the Plan is presented in Appendix A.

GOING-CONCERN VALUATION

The actuarial liability is the portion of the total funding requirement of the Plan allocated to prior years by the actuarial cost method and assumptions. Likewise, the normal actuarial cost represents the portion of the total funding requirement allocated to a particular year of membership. The total funding requirement was determined on the basis of:

- the Plan provisions in effect on the valuation date;
- the actuarial cost method and assumptions which were selected in the context of the long-term funding of the Plan and which are based on Bell Canada's terms of engagement. Although the assumptions are intended to have long-range validity, emerging experience in any given year may differ from the assumptions and can result in experience gains and losses which will be revealed in future valuations; and
- the membership data which, after appropriate validation, was found to be sufficient and reliable for the purposes of the valuation.

The actuarial cost method and assumptions, provisions for expenses and adverse deviation, the membership data and the Plan provisions are summarized in the appendices.

II – Valuation Results (cont'd)

Financial position of the Plan

The financial position of the Plan is measured by comparing the actuarial value of Plan assets with the going-concern actuarial liability. The financial position of the Plan can be summarized as follows:

<i>(in millions)</i>	December 31, 2016	December 31, 2015
DB Component		
Actuarial Value of Assets		
Including unused advance contributions	\$15,344.8	\$14,768.5
Excluding unused advance contributions	\$15,000.6	\$14,556.5
Actuarial Liability		
Active Members	\$2,973.6	\$3,597.9
Pay Equity Accounts	16.3	17.5
Pensioners	10,479.8	9,156.2
Beneficiaries	540.5	476.2
Deferred Pensions	378.7	356.2
Transferred Members ⁽¹⁾	141.4	177.0
Outstanding Payments	10.7	9.9
Total	\$14,541.0	\$13,790.9
Actuarial Surplus/(Deficit)		
Including unused advance contributions	\$803.8	\$977.6
Excluding unused advance contributions	\$459.6	\$765.6
DC Component		
Actuarial Value of Assets/Liability	\$998.4	\$740.0

⁽¹⁾ Members with past entitlements remaining in the Plan

The reconciliation of the actuarial surplus since the last valuation is presented in Appendix C.

Normal Actuarial Cost

<i>(in millions)</i>	2017			2016		
	DB	DC	Total	DB	DC	Total
Estimated Employer Cost	\$113.8	\$86.7	\$200.5	\$133.5	\$82.4	\$215.9
(% of Pensionable Earnings)	13.2%	5.8%	8.5%	13.6%	5.7%	8.9%
Estimated Member Voluntary Contributions	n/a	27.3	27.3	n/a	25.7	25.7
(% of Pensionable Earnings)	n/a	1.8%	1.2%	n/a	1.8%	1.1%
Estimated Member Additional Contributions	n/a	16.3	16.3	n/a	13.9	13.9
(% of Pensionable Earnings)	n/a	1.1%	0.7%	n/a	1.0%	0.6%
Total Normal Actuarial Cost	\$113.8	\$130.3	\$244.1	\$133.5	\$122.0	\$255.5
(% of Pensionable Earnings)	13.2%	8.7%	10.3%	13.6%	8.5%	10.6%
Estimated Pensionable Earnings	\$859.0	\$1,505.8	\$2,364.8	\$979.3	\$1,433.1	\$2,412.4

The breakdown of the actuarial liability, the actuarial surplus/(deficit) and the normal actuarial cost by participating company is presented in Appendix B.

Sensitivity Analysis

If a 1.0% lower discount rate would be used, the impact on the actuarial liability and the normal actuarial cost of the DB Component would be an increase of \$2,008.4 million and \$24.0 million respectively.

II – Valuation Results (cont'd)

SOLVENCY VALUATION

The PBSA requires that the solvency of a pension plan be ascertained when a valuation is performed. The purpose of the regulatory provisions in relation with the solvency test is to accelerate the funding of a pension plan when its financial position falls below the prescribed level. As per the regulations, an Adjusted Solvency Asset Amount is calculated by multiplying the Average Solvency Ratio by the amount of the solvency liabilities.

The following table presents the solvency valuation results of the DB Component and provides details of the calculation of the solvency deficiency as at the valuation date:

<i>(in millions)</i>	December 31, 2016	December 31, 2015	December 31, 2014
Solvency Assets			
Market Value of Assets	\$15,515.5	\$15,225.3	\$14,976.0
Wind-up Expenses	(16.0)	(13.0)	(13.0)
TOTAL	\$15,499.5	\$15,212.3	\$14,963.0
Solvency Liability			
Active Members ⁽¹⁾	\$3,793.0	\$4,403.3	\$4,254.5
Pay Equity Account	16.3	17.5	18.4
Pensioners	11,155.4	10,547.9	10,625.4
Beneficiaries	557.5	531.2	521.6
Deferred Pensions ⁽²⁾	480.8	486.4	474.1
Transferred Members ⁽¹⁾⁽³⁾	177.9	214.0	221.4
Outstanding Payments	10.7	9.9	7.6
TOTAL	\$16,191.6	\$16,210.2	\$16,123.0
Solvency Shortfall	(\$692.1)	(\$997.9)	(\$1,160.0)
Solvency Ratio	95.7%	93.8%	92.8%
Adjustments			
plus PV of Prior Amortization Payments ⁽⁴⁾	n/a	\$220.5	\$588.4
Impact on Solvency Ratio	n/a	1.4%	3.6%
less Unused Advance Contributions	(\$348.1)	(\$218.6)	(\$342.7)
Impact on Solvency Ratio	(2.1%)	(1.3%)	(2.1%)
Adjusted Solvency Ratio	93.6%	93.9%	94.3%
Average Solvency Ratio	93.9% = (93.6% + 93.9% + 94.3%) / 3		
Adjusted Solvency Asset Amount ⁽⁵⁾	\$15,203.9 = 93.9% x \$16,191.6		
Solvency Deficiency	(\$987.7) = \$15,203.9 - \$16,191.6		

⁽¹⁾ Corresponds to the sum of the liability for active and transferred members who are not within 10 years of pensionable age (\$2,187.9 million as at December 31, 2016) and the liability for active and transferred members who are within 10 years of pensionable age and whose entitlement is valued using the Replicating Portfolio rate (\$1,783.0 million as at December 31, 2016)

⁽²⁾ \$332.7 million is valued using the Replicating Portfolio rate while \$148.1 million is valued using Commuted Value rates

⁽³⁾ Members with past entitlements remaining in the Plan

⁽⁴⁾ Based on the present value of amortization payments of \$374.1 million for 2015 and \$220.5 million for 2016 using interest rates of 2.50% as at December 31, 2014 and 2.10% as at December 31, 2015

⁽⁵⁾ The Adjusted Solvency Asset Amount at the prior valuation date was \$15,107.9 (= 93.2% x \$16,210.2)

The breakdown of the actuarial liability by participating company is presented in Appendix B and the actuarial assumptions used in the calculation of the solvency liability are described in Appendix D.

II – Valuation Results (cont'd)

Transfer Deficiency

As at December 31, 2016, the DB Component of the Plan has a solvency ratio equal to 95.7%. In line with directives issued by the Superintendent, the Employer has elected to contribute to the fund an amount equal to the transfer deficiency (4.3% of the pension benefit credit) in order for the Plan to transfer the full value of any pension benefit credit out of the Plan.

Sensitivity Analysis

If a 1.0% lower discount rate would be used, the impact on the solvency liability of the DB Component would be an increase of \$2,534.5 million.

Incremental Cost

The incremental cost represents the present value, at the valuation date, of the expected aggregate change in the solvency liability between the valuation date and the next valuation date.

The incremental cost for the DB Component between December 31, 2016 and December 31, 2017 is estimated at \$264.2 million.

The actuarial assumptions used in the determination of the incremental cost are the same as those used for the determination of the solvency liability. The calculation methodology is described in Appendix F.

DC Component

As at December 31, 2016, in addition to the above DB Component, the DC Component of the Plan has a market value of assets equal to liabilities of \$998.4 million (\$740.0 million as at December 31, 2015).

HYPOTHETICAL WIND-UP VALUATION

The Canadian Institute of Actuaries (“CIA”)’s Standards require actuaries to report the financial position of a pension plan on the assumption that the plan is wound up on the effective date of the valuation, with benefits determined on the assumption that the pension plan has neither a surplus nor a deficit. The scenario which has been hypothesized is that the employer’s business would be discontinued and all BCE pension plans would be terminated on the valuation date. Although no benefits are directly dependent on the postulated scenario, the approach to settle benefits may be impacted by such scenario.

The financial position under this basis is equal to the solvency shortfall. More specifically, if the Plan was to be wound up on the valuation date, solvency liabilities and wind-up expenses would exceed the market value of plan assets by \$692.1 million (shortfall of \$997.9 million as at December 31, 2015).

III – EMPLOYER CONTRIBUTIONS

EMPLOYER CONTRIBUTIONS

The financial position of the Plan as at December 31, 2016 shows the presence of a going-concern surplus of \$459.6 million (surplus of \$803.8 million when unused advance contributions are included) and a solvency deficiency of \$987.7 million. The Plan has a solvency shortfall of \$692.1 million at the same date.

The Employer funding requirement for 2017 consists of:

- the **Normal Actuarial Cost**, which is the portion of the total funding requirement of the Plan allocated to the current year by the actuarial funding method and assumptions, and
- the **Amortization Payments**, which are required to liquidate the solvency deficiency, less
 - letters of credit that can be deposited into the pension fund in lieu of making cash payments to amortize the solvency deficiency, and
 - the **Advance Contributions**, which can be used to reduce amortization payments.

AMORTIZATION PAYMENTS

Solvency

The required annual solvency amortization payments for 2017, determined as the solvency deficiency divided by five, are equal to \$197.5 million.

MINIMUM CONTRIBUTION REQUIREMENTS / MAXIMUM ELIGIBLE CONTRIBUTIONS

The minimum and maximum Employer funding requirements for 2017 are as follows:

<i>(in millions)</i>	Minimum	Maximum
Employer Normal Actuarial Cost		
DB Component	\$113.8	\$113.8
DC Component ⁽¹⁾	<u>86.7</u>	<u>86.7</u>
Total	\$200.5	\$200.5
Amortization Payments	<u>\$197.5</u> ⁽²⁾	<u>\$692.1</u> ⁽³⁾
Employer Contribution	\$398.0	\$892.6

⁽¹⁾ The estimated amounts are based on Members' contribution rates as at the valuation date, including bonuses at target levels

⁽²⁾ In accordance with Paragraph 9(6) of the PBSA Regulations, the amortization payments may be reduced by unused advanced contributions made in prior years (\$348.1 million as at December 31, 2016)

⁽³⁾ The Employer may make larger amortization payments, up to the greater of the solvency shortfall and any unfunded actuarial liability

III – Employer Contributions (cont'd)

Given the solvency ratio of the Plan and in line with the directives issued by the Superintendent, the Employer has elected to contribute to the fund an amount equal to the transfer deficiency (4.3% of the pension benefit credit) in order for the Plan to transfer the full value of any pension benefit credit out of the DB component of the Plan.

Appendix G sets out the minimum contribution requirements. Appendix H describes the maximum eligible contributions.

IV – ACTUARIAL OPINION

In our opinion, for the purposes of this actuarial valuation, the data used is sufficient and reliable, the assumptions made are appropriate and the methods employed are appropriate. This actuarial opinion forms an integral part of the report.


Based on the results of this valuation, we hereby certify that, as at December 31, 2016:

- The Plan has total liabilities of \$15,539.4 million and has a going-concern actuarial surplus of \$459.6 million (surplus of \$803.8 million when unused advance contributions are included).
- The Plan has a solvency deficiency of \$987.7 million and a solvency shortfall of \$692.1 million. The solvency ratio of the Plan is 95.7% and the average solvency ratio of the Plan is 93.9%.
- In our opinion, the value of the Plan assets would be less than the actuarial liability if the Plan were to be wound up on the valuation date. Specifically, solvency liabilities and wind-up expenses would exceed the market value of plan assets by \$692.1 million.
- The solvency amortization payments for 2017, determined as the amount of the solvency deficiency divided by 5, are equal to \$197.5 million. These amortization payments may be reduced by unused advance contributions made in prior years, which equal \$348.1 million.
- The rules for computing the Employer normal actuarial cost under the DB Component of the Plan for 2017 are as follows:


<i>(in millions)</i>	% of DB Payroll	2017
BELL	13.5%	\$98.0
EXPERTECH	12.3%	4.9
MOBILITY	11.4%	10.4
BELL TV	11.5%	0.3
MEDIA	<u>15.4%</u>	<u>0.2</u>
TOTAL	13.2%	\$113.8

- The rules for computing the Employer contribution under the DC Component of the Plan is 4% of Pensionable Earnings, plus a matching of Member contributions up to a maximum of 2% of Pensionable Earnings. The estimated Employer contribution for 2017 is \$86.7 million, based on Members' contribution rates as at valuation date, including bonuses at target levels.

This actuarial opinion has been given and this report has been prepared in accordance with accepted actuarial practice in Canada and in conformity with the funding and solvency standards prescribed by the Pension Benefits Standards Act, 1985 and related Regulations. The report conforms with the recommendations adopted by the Canadian Institute of Actuaries for the valuation of pension plans.


Robert Marchessault, F.C.I.A.
June 2017


Stéphan Cliche, F.C.I.A.


Joël Lépine, F.C.I.A.

APPENDICES

Assets

Appendix A

Market Value of Assets

The information on assets of the Plan has been taken from the annual financial statements of the funds as at December 31, 2016 audited by Deloitte LLP as well as the monthly financial statements issued by RBC Investor & Treasury Services, adjusted for pending individual transfers under reciprocal agreements. The change in the market value of assets since the last valuation, including unused advanced contributions, can be summarized as follows:

<i>(in millions)</i>	2016		
	DB Component	DC Component	Total
Market value of assets as at January 1 (as per last year's financial statements)	\$15,248.7	\$740.0	\$15,988.7
Adjustments (pending individual transfers under reciprocal agreements)	<u>(23.4)</u>	-	<u>(23.4)</u>
Market value of assets as at January 1 (after adjustments)	\$15,225.3	\$740.0	\$15,965.3
Plus			
Employer contributions	486.8	80.2	567.0
Member contributions	-	39.0	39.0
Transfers from other pension plans	8.1	133.6	141.7
Investment income	0.2	47.4	47.6
Increase/(Decrease) in value of investments	711.4	31.4	742.8
Less			
Pension payments	(784.0)	-	(784.0)
Lump sum withdrawals	(53.1)	(73.0)	(126.1)
Transfers to other pension plans	(28.9)	(0.1)	(29.0)
Non-investment expenses	(10.7)	(0.1)	(10.8)
Longevity swap investment management fees	(15.1)	-	(15.1)
Other investment expenses	<u>(11.3)</u>	-	<u>(11.3)</u>
Market value of assets as at December 31 ^{(1) (2) (3)} (as per financial statements)	\$15,552.1	\$998.4	\$16,550.5
Adjustments (pending individual transfers under reciprocal agreements)	<u>(36.6)</u>	-	<u>(36.6)</u>
Market value of assets as at December 31 (after adjustments)	\$15,515.5	\$998.4	\$16,513.9

⁽¹⁾ Includes market value for longevity swap investment, valued at (\$25.6) million at valuation date

⁽²⁾ Includes \$11.1 million of contributions receivable for the DB Component

⁽³⁾ Includes \$68.2 million of voluntary member contributions for the DC Component

Assets (cont'd)**Appendix A****Asset Mix**DB Component

The SIPP was modified in 2016 to provide for different target asset mix for periods during which members are active members or inactive members in the Plan. The revised SIPP provides for the following:

	Allocation to Low-Risk Assets	Allocation to Return Generating Assets
For periods before retirement	45%	55%
For periods after retirement	20%	80%

The allocation of assets between Low Risk Assets and Return Generating Assets will be adjusted on an annual basis to reflect the evolution of the demographics in the membership of the Plan.

Based on the membership of the Plan as at valuation date, the resulting asset mix of the Plan as at December 31, 2016 is as follows:

	Minimum	Allocation at Valuation Date	Maximum
Low Risk Assets	60.0%	70.0%	80.0%
Real Return Bonds	5.0%	9.0%	15.0%
Nominal Bonds	45.0%	55.2%	75.0%
Infrastructure Equity	0.0%	2.6%	10.0%
Real Estate	0.0%	0.3%	10.0%
Cash & Money Market	0.0%	2.9%	10.0%
Return Generating Assets	20.0%	30.0%	40.0%
Canadian Equities	0.0%	4.1%	12.0%
Non-Canadian Equities	0.0%	14.1%	30.0%
Dividend Equities	0.0%	3.8%	7.0%
Private Equity	0.0%	3.4%	8.0%
Hedge Funds	0.0%	3.0%	10.0%
Other ⁽¹⁾	n/a	1.6%	n/a

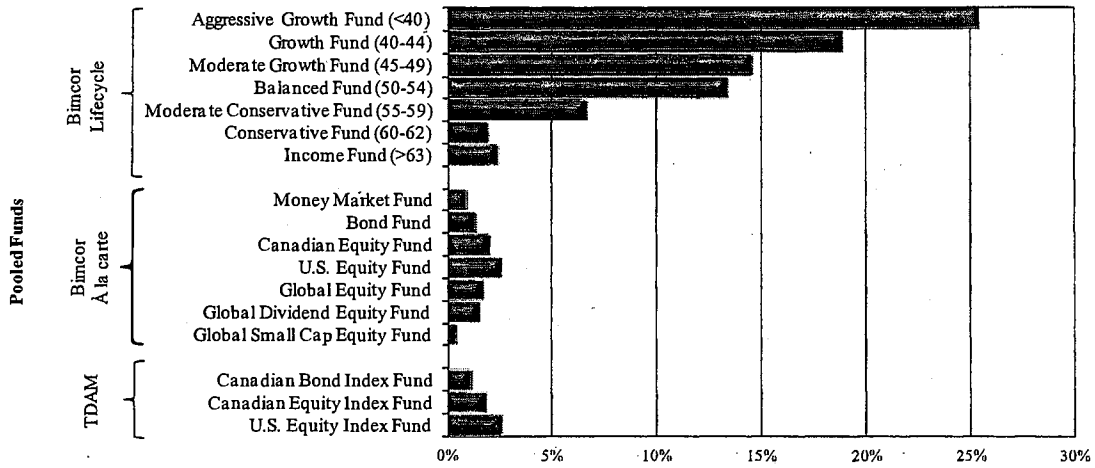
⁽¹⁾ Includes High Yield Bonds, Loans, Risk Parity and units of diversified pooled funds

Assets (cont'd)

Appendix A

DC Component

The DC Component's asset mix is determined by the investment options selected by Plan Members. The investment breakdown of the DC Component assets of the Plan as at December 31, 2016 is as follows:



Assets (cont'd)**Appendix A****Actuarial Value of Assets**DB Component

The actuarial value of assets is an adjusted value intended to stabilize the impact on the Plan's funding requirement of short-term fluctuations in the market value of public equities, while valuing the remaining assets at market value.

The adjustment ratio for public equities is obtained by comparing, over a four-year period, the market value of \$1 of the public equity portion of the fund at the beginning of the period with a target value which is based on the annual increase in the Consumer Price Index ("CPI"), rounded to the nearest basis point, plus the expected real rate of return on the public equity portion of the fund ("Real Equity Return"). The adjustment ratio for public equities is equal to the average of the year-end ratios of market value to target value divided by the ratio prevailing as at the valuation date.

The overall adjustment ratio is set equal to the adjustment ratio for public equities multiplied by the relative weight of the public equity portion of the fund according to the asset allocation as at the valuation date, plus the relative weight of the remaining assets portion of the fund according to the asset allocation as at the valuation date, but without falling outside a corridor of $\pm 10\%$.

The same asset valuation method was used in the previous valuation.

Year	Target Value (b.o.y.)	CPI + Real Equity Return ⁽¹⁾	Target Value (e.o.y.)	Market Value (e.o.y.)	Ratio of Market to Target Values
2013	1.0000	6.74%	1.0674	1.2960	121.4%
2014	1.0674	6.97%	1.1418	1.4826	129.8%
2015	1.1418	7.11%	1.2230	1.7183	140.5%
2016	1.2230	6.50%	1.3025	1.8266	140.2%
Average Ratio:					133.0%
Adjustment Ratio for Public Equities:					94.9%
Public Equity Portion of the Fund:					22.0%
Overall Adjustment Ratio:					98.9%

⁽¹⁾ Real Equity Return equal to 5.5% for 2013, 2014 and 2015 and 5.0% for 2016

DC Component

The market value of assets is used as the actuarial value of assets.

Assets (cont'd)

Appendix A

Total

The total market value of assets and the actuarial value of assets as at December 31, 2016 is as follows:

<i>(in millions)</i>	DB Component	DC Component	TOTAL
Market value of assets (after adjustments)			
Including unused advance contributions	\$15,515.5	\$998.4	\$16,513.9
Excluding unused advance contributions	\$15,167.4	\$998.4	\$16,165.8
Overall Adjustment Ratio	98.9%	100.0%	98.9% / 100.0%
Actuarial value of assets (after adjustments)			
Including unused advance contributions	\$15,344.8	\$998.4	\$16,343.2
Excluding unused advance contributions	\$15,000.6	\$998.4	\$15,999.0

Advance Contributions

Advance contributions of \$348.1 million were made to the Plan in 2016 and previous unused advance contributions have been used to reduce 2016 required amortization payments. The balance of unused advance contributions at the valuation date can be used to reduce future minimum required deficit funding. The reconciliation of unused advance contributions since the previous valuation is as follows:

<i>(in millions)</i>	
Unused advance contributions (as at December 31, 2015)	\$218.6
Used to satisfy a portion of the 2016 deficit amortization requirements	(218.6)
New advance contributions in 2016	<u>348.1</u>
Unused advance contributions (as at December 31, 2016)	\$348.1

Valuation Results Breakdown by Participating Company

Going-Concern Valuation

(in millions)	December 31, 2016					December 31, 2015
	BELL	EXPERTECH	MOBILITY	BELL TV	MEDIA	TOTAL
DB Component						
Actuarial Value of Assets ⁽¹⁾						\$15,000.6
Actuarial Liability						
Active Members	\$2,623.4	\$130.1	\$211.0	\$6.1	\$3.0	\$3,597.9
Pay Equity Accounts	16.3	-	-	-	-	17.5
Pensioners	9,975.4	422.7	80.2	1.3	0.2	10,479.8
Survivors	527.4	12.7	0.4	-	-	540.5
Deferred Pensions	324.1	8.4	44.5	1.6	0.1	378.7
Transferred Members	141.3	-	0.1	-	-	141.4
Outstanding Payments	9.6	0.9	0.2	=	=	10.7
Total	\$13,617.5	\$574.8	\$336.4	\$9.0	\$3.3	\$14,541.0
Actuarial Surplus / (Deficit)						\$765.6 ⁽²⁾
DC Component						
Actuarial Value of Assets/Liability	\$520.5 ⁽³⁾	\$14.8	\$127.2	\$28.1	\$307.8	\$998.4
DB Employer Normal Actuarial Cost (% of DB Pensionable Earnings)	\$98.0 13.5%	\$4.9 12.3%	\$10.4 11.4%	\$0.3 11.5%	\$0.2 15.4%	\$113.8 13.2%
DC Employer Cost (estimated) ⁽⁴⁾ (% of DC Pensionable Earnings)	\$41.6 5.8%	\$2.4 5.7%	\$12.2 5.8%	\$1.9 5.7%	\$28.6 5.7%	\$86.7 5.8%
DC Member Contributions (estimated) ⁽⁴⁾ (% of DC Pensionable Earnings)	\$21.8 3.0%	\$1.1 2.6%	\$5.8 2.8%	\$0.8 2.4%	\$14.1 2.8%	\$43.6 2.9%
Total Normal Actuarial Cost (% of Total Pensionable Earnings)	\$161.4 11.2%	\$8.4 10.3%	\$28.4 9.4%	\$3.0 8.3%	\$42.9 8.6%	\$244.1 10.3%
DB Pensionable Earnings	\$723.6	\$39.9	\$91.6	\$2.6	\$1.3	\$859.0
DC Pensionable Earnings	\$721.6	\$41.9	\$210.0	\$33.4	\$498.9	\$1,505.8
Total Pensionable Earnings	\$1,445.2	\$81.8	\$301.6	\$36.0	\$500.2	\$2,364.8

⁽¹⁾ Excluding unused advance contributions

⁽²⁾ The previous valuation report indicated an actuarial surplus of \$977.6 million, including unused advance contributions with an actuarial value of \$212.0 million

⁽³⁾ Including \$1.1 million of ONTERA's DC accounts not yet transferred as at December 31, 2016

⁽⁴⁾ Based on Members' contribution rates as at the valuation date, including bonuses at target level

Appendix B

Valuation Results Breakdown by Participating Company (cont'd)

Solvency Valuation

	December 31, 2016				December 31, 2015	
	BELL	EXPERTECH	MOBILITY	BELL-TV	MEDIA	TOTAL
<i>(in millions)</i>						
DB Component						
Solvency Assets						
Market Value of Assets						\$15,225.3
Wind-Up expenses						(13.0)
Total						\$15,212.3
Solvency Liability						
Active Members	\$3,339.6	\$165.3	\$276.2	\$8.0	\$3.9	\$4,403.3
Pay Equity Accounts	16.3	-	-	-	-	17.5
Pensioners	10,610.2	457.1	86.5	1.4	0.2	10,547.9
Survivors	543.5	13.6	0.4	-	-	531.2
Deferred Pensions	407.7	10.7	60.1	2.1	0.2	486.4
Transferred Members	177.7	-	0.2	-	-	214.0
Outstanding Payments	9.6	0.9	0.2	=	=	9.9
Total	\$15,104.6	\$647.6	\$423.6	\$11.5	\$4.3	\$16,210.2
Solvency Surplus/(Shortfall)						(\$997.9)
Solvency Deficiency						(\$1,102.3)
Minimum Required Amortization Payments⁽¹⁾						\$220.5
DC Component						
Actuarial Value of Assets/Liability	\$520.5 ⁽²⁾	\$14.8	\$127.2	\$28.1	\$307.8	\$740.0

⁽¹⁾The total minimum required amortization payment of \$197.5 million (\$220.5 million in 2016) must be paid by the participating companies in accordance with agreements/arrangements that can be entered into with the plan sponsor (i.e. Bell Canada)

⁽²⁾Including \$1.1 million of ONTERA's DC accounts not yet transferred as at December 31, 2016

Actuarial Surplus Reconciliation

Appendix C

Financial Position of the Plan

<i>(in millions)</i>	December 31, 2016	December 31, 2015
Actuarial Value of Assets ⁽¹⁾	\$15,999.0	\$15,296.5
Actuarial Liability		
DB Component	\$14,541.0	\$13,790.9
DC Components	<u>\$998.4</u>	<u>\$740.0</u>
	\$15,539.4	\$14,530.9
Actuarial Surplus/(Deficit)	\$459.6	\$765.6

⁽¹⁾ Including DC Components and excluding unused advance contributions

Sources of Change in Financial Position

Since the last valuation, the actuarial surplus has decreased from \$765.6 million to \$459.6 million. This is the result of several factors which are estimated as follows:

<i>(in millions)</i>			
Actuarial surplus as at December 31, 2015 ⁽¹⁾			\$765.6
Deficit amortization and expected interest:			
- Minimum required amortization payments		\$220.5	
- Transfer deficiency payments		3.3	
- Expected interest		41.7	
		<u>\$265.5</u>	265.5
Main components of experience:			
- Gain/(Loss) from investment income ⁽²⁾		\$287.5	
- Gain/(Loss) from salary increases		27.2	
- Gain/(Loss) from YMPE increase		(17.7)	
- Gain/(Loss) from indexation of pensions		51.2	
- Gain/(Loss) from non-investment expenses		0.3	
- Gain/(Loss) from retirement		(26.9)	
- Gain/(Loss) from mortality		(1.0)	
- Gain/(Loss) from withdrawal		(13.3)	
- Gain/(Loss) from other membership movements		(6.9)	
- Gain/(Loss) from miscellaneous factors		0.1	
		<u>\$300.5</u>	300.5
Impact of other changes:			
- Gain/(Loss) from change in discount rate		(881.1)	
- Gain/(Loss) from change in other economic assumptions		9.1	
		<u>(\$872.0)</u>	(872.0)
Actuarial surplus as at December 31, 2016			\$459.6

⁽¹⁾ The previous valuation report indicated an actuarial surplus of \$977.6 million, including unused advance contributions

⁽²⁾ Includes for longevity swap: decrease of (\$23.5) million in market value and \$15.1 million of management fees

Appendix D

Actuarial Assumptions

Summary of Assumptions

	Going-Concern Basis	Replicating Portfolio ⁽¹⁾	Commuted Value
Economic Factors			
Discount Rate	Before retirement: 5.05% for 10 years; 6.14% thereafter <i>(previously: 4.75%)</i> After retirement: 3.22% for 10 years; 5.16% thereafter <i>(previously: 4.73%)</i>	3.35% <i>(previously: 3.42%)</i>	2.20% for 10 years; 3.50% thereafter <i>(previously: 2.10% for 10 years; 3.70% thereafter)</i>
Inflation	2.00%	2.00%	1.09% for 10 years; 2.17% thereafter <i>(previously: 0.79% for 10 years; 1.87% thereafter)</i>
Pension Indexation	1.47% until age 65; 1.60% thereafter <i>(previously: 1.50% until age 65; 1.60% thereafter)</i>	1.47% until age 65; 1.60% thereafter	1.09% for 10 years; 1.57% thereafter <i>(previously: 0.79% for 10 years; 1.47% thereafter)</i>
Basic Salary Increases	2.25%	n/a	n/a
Merit and Promotional Scale	Table 1 for managers only	n/a	n/a
Escalation of YMPE under Canada/Quebec Pension Plan	2.50%	n/a	n/a
Maximum pension per year of service under the Income Tax Act	\$2,914.44 in 2017 indexed at 2.50% per annum from 2018 <i>(previously: \$2,890.00)</i>	\$2,890.00 ⁽²⁾ <i>(previously: \$2,818.89)</i>	\$2,890.00 ⁽²⁾ <i>(previously: \$2,818.89)</i>

⁽¹⁾ Replicating Portfolio approach (detailed starting on page D8)

⁽²⁾ As per plan provisions, the maximum pension amount applicable is the one at the time of termination or retirement from the Plan

Appendix D

Actuarial Assumptions (cont'd)

Summary of Assumptions (cont'd)

	Going-Concern Basis	Solvency Basis
<u>Decrement Rates</u>		
Mortality	Table 2: CPM Private adjusted for plan-specific experience	<u>Replicating Portfolio</u> (1) Table 2: CPM Private adjusted for plan-specific experience
Disability	Nil	Commuted Value CPM Unisex 50% (2) projected with scale B
Withdrawal	Table 3	Nil
Retirement	Table 4	100%
- Active Members	Age 65	100%
- Disabled Members		100%
<u>Other Assumptions</u>		
Age difference between spouses	Males 3 years older	Males 3 years older
Proportion opting for survivor pension	66.7%	66.7%
Proportion opting for commuted values	n/a	Table 5
Incentive compensation payout	at target	n/a
Explicit provision for expenses	\$11 million for annual on-going non-investment expenses included in normal actuarial cost	\$16 million for wind-up expenses deducted from plan assets (previous): \$13 million

(1) Replicating Portfolio approach (detailed starting on page D8)

(2) Represents the actual proportion male/female at the valuation date

Actuarial Assumptions (cont'd)

Appendix D

Summary of Assumptions (cont'd)

Table 1 - Merit and Promotional Scale (sample)

Age	Scale ⁽¹⁾
15	100
25	163
35	214
45	225
55	225
65	225

⁽¹⁾ Used for managers only as unionized employees are all considered to have reached their highest employment level

Table 2 - Mortality Rates

	Mortality Assumptions ⁽¹⁾	Future Improvements
Males	80% of the male rates of the CPM 2014 Private Sector Mortality Table	100% of CPM Improvement Scale B
Females	115% of the female rates of the CPM 2014 Private Sector Mortality Table	100% of CPM Improvement Scale B

⁽¹⁾ Based on the assumption used, the life expectancy of a member age 65 at the valuation date is 23.3 years for males and 23.0 years for females (compared to 21.6 and 24.0 respectively for the CPM 2014 Private Sector Mortality Table)

Table 3 - Withdrawal Rates (sample)

Age	Non-Managers	Managers
25 and -	20.0%	7.0%
30	11.2%	7.0%
35	6.3%	7.0%
40	3.4%	7.0%
45	1.8%	4.7%
50	1.2%	2.3%
55 and +	nil	nil

Actuarial Assumptions (cont'd)**Appendix D****Summary of Assumptions (cont'd)****Table 4 - Retirement Rates**

Age	Rates for Members eligible to the Protection of Pension Rights	Rates for Members not eligible to the Protection of Pension Rights
55	45%	10%
56 to 60	25%	10%
61	25%	15%
62	25%	20%
63	25%	25%
64	25%	30%
65	100%	100%

Table 5 - Proportion opting for commuted values

Members	Proportion
Active Members:	
- under age 55	100%
- above age 55 ⁽¹⁾	0%
Deferred Pensioners:	
- under age 55	50%
- above age 55 ⁽¹⁾	0%
Pensioners and Beneficiaries	0%

⁽¹⁾ As per plan provisions, members eligible for early retirement are not allowed to receive the commuted value of their benefits. The plan administrator can still choose to offer this option upon plan termination, but is not expecting to do so if it is more expensive than settling benefits through the Replicating Portfolio. As such, based on market conditions at the valuation date, commuted values are not expected to be offered to members eligible for early retirement.

Actuarial Assumptions (cont'd)

Appendix D

Comments on Assumptions

Going-Concern Valuation

Starting with this valuation, the discount rate for the going-concern actuarial valuation is now set separately for periods while a member is an active member and for periods while a member is an inactive member. The discount rate applicable for the different periods reflects the different target asset mixes in line with the Plan's SIPP investment strategy as described in Appendix A.

For each of the two target asset mixes, the rates are based on assumed gross rates of investment return derived from a model developed by Mercer, actuarial and investment consultants ("Mercer"). The gross rate for each major asset class is set consistent with market conditions on the valuation date modified to include a provision for increases over a period of 10 years in market interest rates to a level higher than the current historically low levels. The gross rate of investment return, for each of the two target asset mixes is expressed using a select 10 year following the valuation date and ultimate approach.

The rates are applied consistently with the status of a member. The select and ultimate rates for periods while an active member are applied up to the date the member is expected to retire and the applicable rates for inactive members are applied thereafter, thus reflecting the change in target asset mix on such date. At the valuation date, the discount rate is developed as follows :

	Discount rate	Impact on actuarial liabilities	Impact on normal actuarial cost
Gross rate of investment return	Varies from 3.39% to 6.31%		
Added value up to active management expenses	0.25%	<i>offset each other</i>	<i>offset each other</i>
Active management expenses	(0.25%)		
Provision for adverse deviation ⁽¹⁾	(0.15%)		
Passive investment expenses	(0.02%)	+ \$266.5 million	+ \$3.1 million
Net Discount Rate	Varies from 3.22% to 6.14% ⁽²⁾	+ \$35.8 million	+ \$0.5 million

⁽¹⁾ As per Bell Canada's terms of engagement

⁽²⁾ Can be approximated with a level discount rate of ~4.25% for liabilities and ~5.00% for normal actuarial cost

Basic salary increases have remained unchanged at 2.25%. YMPE escalation assumptions and increases in the maximum pension permitted under the Income Tax Act have also remained unchanged at 2.50%. These assumptions reflect long-term expectations, given prevailing industry and economic conditions and are in line with the inflation assumption, which has remained unchanged at 2.00%.

Actuarial Assumptions (cont'd)

Appendix D

The pension indexation assumption remained unchanged, except that it is now rounded to the nearest basis point, and was derived from a stochastic model for inflation developed by Mercer ("Mercer's Inflation Model"). The model produces 500 scenarios over a 20-year period and has the following characteristics at the valuation date (model and characteristics reviewed annually by Mercer):

Annualized inflation over 20 years:	Median: 2.0% Minimum: 0.30% Maximum: 4.80% 80% of scenarios between 1.3% and 2.9%
Volatility of inflation:	Annual standard deviation of 1.5% over a single year in the long-term (lower in the short-term due to serial correlation) Average standard deviation over 20 years (over the 500 scenarios): 1.3%

The model recognizes that future inflation will continue to be actively managed by the Bank of Canada but that it can also be impacted by external economic factors (such as US Monetary policies) beyond local control. Consequently, future annual inflation may be outside the 1%-3% range currently targeted by the Bank of Canada. The model also displays relatively high serial correlation i.e. years of high inflation tend to be followed by years with similarly high inflation, and the same with low inflation.

The indexation assumption is then derived from the above stochastic model, based on the plan-specific indexation formula. Our best estimate indexation assumptions of 1.47% before age 65 and 1.60% thereafter are equal to the median indexation rate (based on median inflation of 2.0%).

Mortality rates have remained unchanged, reflecting plan experience supported by a mortality study conducted in 2014 considering Bell Canada and its affiliated companies' experience ("Bell Mortality Study"). The study revealed mortality rates for retirees are lower for males and higher for females than the rates of the CPM 2014 Private table. The size of the group included in the study being credible, adjustments supported by the study were used as best estimate of current mortality rates. If the CPM 2014 Private table had been used, the impact on the actuarial liability and normal actuarial cost would have been a decrease of \$98.3 million and \$1.1 million respectively.

Retirement rates and withdrawal rates also remained unchanged since the previous valuation. No assumptions are made for disability as they would have a negligible impact on the valuation results.

The explicit provision for non-investment expenses has remained unchanged since the previous valuation.

The maximum pension permitted under the Income Tax Act has been increased to \$2,914.44 in 2017 and is projected at 2.50% until the member terminates employment, retires or dies.

Solvency Valuation

The CIA's Standards require actuaries to report the financial position of a pension plan on the assumption that the plan is wound up on the effective date of the valuation, with benefits determined on the assumption that the pension plan has neither a surplus nor a deficit ("Hypothetical wind-up basis"). The Act also requires the financial position of the Plan to be determined on a solvency basis. The same basis was used for both valuations. The basis used for the solvency valuation reflects the situation that could have prevailed had the Plan been terminated as at the valuation date. The scenario which has been hypothesized is that the employer's business would be discontinued and all BCE pension plans would be

Actuarial Assumptions (cont'd)**Appendix D**

terminated on the valuation date. Although no benefits are directly dependent on the postulated scenario, the approach to settle benefits may be impacted by such scenario. As per plan provisions and Bell Canada's rules, the applicable maximum pension amount and members' pensionable earnings are those at the time of termination or retirement from the plan, which is as at the valuation date in this scenario. No benefits payable on plan termination were excluded from our calculations. Solvency assumptions and methods are determined under applicable legislation and actuarial standards and are updated at each valuation date as required.

Liabilities in respect of benefits expected to be settled by a commuted value transfer have been determined as described in the CIA's *Practice-Specific Standards for Pension Plans*, with the pension indexation assumption derived from a methodology developed by Morneau Shepell, the plan administrator, which is also used in the actual calculation of commuted values by the plan administrator for employees terminating their employment and eligible to portability. The Morneau Shepell model produces adjustment factors that are used to calculate indexation rates on a monthly basis. It takes into account the likelihood of the maximum annual indexation increase, as per the plan-specific indexation formula, which impacts the pension payable in any year based on the long-term historical experience with respect to the inflation in Canada and on the current economic environment since the model is reviewed on an annual basis by Morneau Shepell.

Liabilities in respect of benefits expected to be settled by a purchase of annuities ("Immediate pensions") would typically be determined based on annuity pricing assumptions in the CIA's *Practice-Specific Standards for Pension Plans* and based on the CIA's Educational Note, *Assumptions for Hypothetical Wind-Up and Solvency Valuations with Effective Dates Between December 31, 2016 and December 30, 2017* ("Proxy Basis").

However, due to the capacity constraints within the Canadian group annuity market for large plans and plans with complex indexation formulas, it is likely that, when considering the liabilities of the Plan and other pension plans sponsored by Bell Canada (estimated at over \$20 billion at the valuation date), the company would not be able to purchase a single group annuity to settle these pension liabilities in the event of a wind-up.

Pension Benefits Standards Act would allow for a postulated scenario for solvency purposes where on a plan termination, assets would not all be liquidated. The replicating portfolio approach is also permitted under OSFI's *Instruction Guide for the Preparation of Actuarial Reports for Defined Benefit Pension Plans* for valuing large plans for which there is a limited annuity market.

As an alternative approach to settling benefits, and as per Bell Canada's terms of engagement, we have used a replicating portfolio approach as described under the September 18, 2013 CIA Educational Note on Alternative Settlement Methods for Hypothetical Wind-Up and Solvency Valuations ("CIA's EN"). The replicating portfolio approach along with the derived actuarial assumptions are described in more details hereafter. The same methodology was used in the Bell Plan's previous valuations. Bell Canada reserves the right to look at other acceptable methodologies to value Immediate pensions in future valuations and to use such other methodologies.

The explicit provision for wind-up expenses reflects the actuary's best estimate assumption and has been revised to reflect a two year period required to settle all benefits. As such, the explicit provision for wind-up expenses has been increased from \$13.0 million to \$16.0 million.

Actuarial Assumptions (cont'd)**Appendix D****Replicating Portfolio Approach**

The methodology to value Immediate pensions is based on a replicating portfolio approach i.e. a portfolio of assets that produces cash flows that match the expected benefit payments to plan members.

In developing the expected benefit cash flows, best estimate assumptions have been used; in particular, plan-specific mortality experience has been reflected including an appropriate allowance for future mortality improvements and the actual indexation formula provided for under plan provisions has been used.

Sufficient margins for adverse deviations have been included to ensure a high probability that the benefit promises will ultimately be met. The margins have been fully reflected in the discount rate.

Projected Benefit Cash Flows - Mortality Assumptions

The projected cash flows are derived based on mortality rates from the Bell Mortality Study, which used the CPM 2014 Private table base rates with adjustment combined with the CPM-B improvement scale without adjustment (as indicated in table 2 of page D3). The adjusted mortality table results in an increase in the overall life expectancy and more conservatism in the projected benefit cash flows when compared to the results obtained with the unadjusted mortality table.

Replicating Portfolio Development

Bell Canada with the assistance of Mercer developed a theoretical replicating portfolio. Mercer confirmed that the theoretical replicating portfolio would match to a high degree the expected benefit payments to plan members and assessed that the financial markets are deep enough to allow for the investment of the fund assets in accordance with the replicating portfolio asset allocation.

The replicating portfolio is comprised of fixed income investments with an initial duration similar to the duration of the liabilities. The dollar duration of the portfolio also match as closely as possible the dollar duration of the liabilities for each of the following periods: 0 to 5 years, 5 to 10 years and over 10 years. Within each of these time periods, the construction of the portfolio is further refined to achieve the best possible cash flow and dollar duration matching over shorter sub-periods.

The CIA's EN provides that primary asset class used should be investment-grade fixed-income investments, including a substantial allocation to high quality fixed-income investments. OSFI has indicated in its Instruction Guide that, for a fixed-income investment to be deemed of high-quality, the rating given by at least one of the recognized rating agencies should be AA or better.

- All fixed income investments in the assumed replicating portfolio are either investment-grade or considered to be investment-grade equivalent for asset classes not formally rated such as private debts.
- The assumed replicating portfolio includes a substantial allocation to high quality fixed income investments as defined by OSFI. The portfolio includes an allocation to high quality fixed-income investments of 50%. Over the life of the portfolio, such percentage may vary within a reasonably narrow range.

Actuarial Assumptions (cont'd)

Appendix D

Replicating Portfolio Composition

The proposed replicating portfolio would be invested in assets in accordance with the following asset allocation:

Asset class	Initial			Ultimate
	Yield	Default and Downgrade Risks ⁽¹⁾	Weight	Yield
Private long-term debt ⁽²⁾	5.27%	0.32%	20.0%	6.68%
Corporate bonds ⁽³⁾				
BBB long-term	4.52%	0.32%	20.1%	5.93%
AA short-term	1.64%	0.07%	10.2%	3.71%
Mid-term ⁽⁴⁾	2.91%	0.17%	11.7%	4.78%
Provincial long-term bonds ⁽⁵⁾	3.22%	0%	38.0%	4.64%
Derivative instruments				
Purchase Canada RRB and sell Canada nominal long-term bonds ⁽⁶⁾	2.29%	0%	+35%	3.42%
	2.27%	0%	-35%	3.90%
Average / Total		0.16%	100%	

⁽¹⁾ Decrease in yield due to assets default and downgrade risks

⁽²⁾ FTSE/TMX Corporate BBB index plus 0.75%

⁽³⁾ From FTSE/TMX Corporate index

⁽⁴⁾ FTSE/TMX Corporate index Mid-term (On December 31, 2016, allocation is 20.7% AAA/AA, 24.5% A and 54.8% BBB)

⁽⁵⁾ FTSE/TMX Provincial index

⁽⁶⁾ Net impact of the purchase and the sale. For the RRB, the yield is expected to be the real yield (i.e. 0.29%) plus the implied inflation of 2.00% for an expected yield of 2.29% (the implied inflation of 2.00% was also used to derive future cash flows). For the Canada nominal long-term bonds, the yield is 2.27%.

An on-going expense assumption of 25 bps has been assumed over the entire projection period of the replicating portfolio covering administration and custodial expenses (4 bps - increasing actuarial liability by \$72.7 million), investment expenses (10 bps - increasing actuarial liability by \$181.7 million) and longevity swap investment management fees (11 bps - increasing actuarial liability by \$199.9 million). In addition to these on-going expenses, the explicit provision for wind-up expenses of \$16 million, deducted from Plan assets, includes an amount of \$9.0 million that may reasonably be expected to be paid for the implementation of the replicating portfolio under the postulated scenario. These would include the fees related to the liquidation of assets not invested in fixed-income and the investment into the replicating portfolio assets. It is expected that these fees would be incurred in lieu of fees that would typically be incurred had an annuity purchase scenario been used which would include the liquidation of the non-fixed income assets, the implementation of a minimum risk investment strategy and the fees related to selling assets and converting into cash to purchase annuities.

Details on assumptions and model

Mercer assisted us in producing the stochastic projections and determining the underlying projection assumptions thereof. The stochastic model includes 500 different economic scenarios, and projections are performed over the entire period of pension benefit cash flows. The model uses a Levy stable distribution that matches very closely the historical returns distribution. The economic scenarios reflect a wide range (favourable and unfavourable) of potential outcomes reflecting variations in yield curves, reinvestment

Actuarial Assumptions (cont'd)**Appendix D**

rates, default rates, liquidity and credit spreads. The model assumes that transactions are made at fair market value.

- The assumed initial yields on the different asset classes are based on the yields of the relevant FTSE/TMX Canada bond indices at the valuation date as described above. The ultimate yields are based on assumed increases in market interest rates over the next 10 years to a level higher than current historically low levels. In the equilibrium yield curve, the yield for a 10-year bond is derived from the assumed long-term nominal GDP growth.
- For private debts, the initial yield is based on FTSE TMX Canada Long Term Corporate BBB plus 0.75%. These assumed initial yields have been derived based on an analysis of the yields for typical private debt portfolios. These investments are expected to provide higher returns than corporate bonds with similar maturities and credit risk due to their reduced liquidity and to recognize that they do provide a source of financing with particular terms.
- The model incorporates the use of derivative instruments such as repurchase agreements (“repos”) and reverse repurchase agreements (“reverse repos”) in order to obtain a certain level of exposure to real return bonds which reduces the inflation risk of the liabilities due to the indexation provision of the pension payments. This is done without leverage in the sense that it does not increase the exposure to financial markets beyond 100% and therefore is not speculative. The portfolio does not take any bets on the movement of interest rates. The total duration of the portfolio remains in line with the duration of the liabilities.
- To obtain the expected net yield for each asset class, other than government bonds, a provision for the expected default risk has been determined, after taking into account the following:
 - It is assumed that fixed income spreads are explained by the following three components: liquidity premium, provision for defaults and additional return due to the higher volatility of returns in comparison with government bonds.
 - The liquidity premium is assumed to be equivalent to the spread between federal and provincial bonds. This assumption would imply that the higher yield for provincial bonds is the result of lower liquidity and not from higher default risk than a Canada bond. This is normally seen as a reasonable assumption by bond managers.
 - The impact of historical defaults on the corporate bond performance has been analyzed. Based on historical defaults, it was established that the impact of corporate defaults on corporate bond returns has been, on average, approximately 25% of the difference between corporate bond yields and provincial bond yields. This is the basis we have used for all asset classes with some credit risk.
 - For derivatives, no default is assumed, since the underlying securities are government bonds, which are marked to market on a daily basis and trades are performed with the largest Canadian banks. The counterparty risk is easily manageable by using several counterparties (usually large Canadian banks) and collateral. These counterparties are the same main intermediaries as those of the Canadian bond market. These intermediaries purchase/sell bonds from/to their clients via the over-the-counter market (i.e. transactions are done directly between the two parties). Therefore, it is expected that in the case of a counterparty default, the loss would be minimal, due to the use of collateral and the fact that the securities are marked-to-market on a daily basis.

Actuarial Assumptions (cont'd)

Appendix D

Based on this methodology and these assumptions, the rate of return over 50 years at the median is expected to be 3.78%. This expected rate of return is net of the expected impact of defaults and downgrades (averaging 16 bps - increasing actuarial liability by \$290.8 million) and on-going expenses (estimated at 25 bps).

Margins for Adverse Deviations

As outlined in CIA's EN, we have included sufficient margins for adverse deviations to ensure a high probability that the benefit promises will ultimately be met.

Margins were established to cover the following contingencies, as applicable under the model used, and still provide for a very high (90%) probability that all future cash flows be ultimately met:

- The risk of asset defaults and/or downgrades (over and above the expected impact of 16 bps assumed);
- The interest rate risk which includes refinancing risk, reinvestment risk and liquidity risk;
- The indexation risk linked to plan specific formula i.e. inflation risk.

These margins translate into a reduction in the discount rate equal to 28 bps (increasing actuarial liability by \$508.9 million). Note that in those cases where benefits are not fully paid, the average payout is 97% of benefits.

Over and above such margin, an additional provision was added to cover the risk of longevity improvements better than the mortality assumptions used on the stochastic model. This provision takes into account the longevity insurance contract entered by the Plan in February 2015. For both males and females, an "additional future improvement", corresponding to 50% of CPM Improvement Scale B, has been added to the improvements, resulting in a new set of projected cash flows using the 150% of CPM Improvement Scale B.

This margin translates into a further reduction in the discount rate equal to 15 bps (increasing actuarial liability by \$272.6 million) to cover the longevity contingency.

Discount Rate under Replicating Portfolio Approach

Based on the above, the derived discount rate assumption is:

Median rate of the proposed Replicating Portfolio (50% probability that generated assets would exceed expected benefit cash flows)	4.19%
Administration, investment management and custodial fees	(0.25%)
Expected impact of defaults and downgrades	(0.16%)
Margin for 90% probability to meet cash flows considering:	
• Asset defaults and/or downgrades (over expected);	
• Reinvestment risk due to cash flow mismatches;	(0.28%)
• Indexation risk linked to plan-specific formula.	
Additional margin for better than expected longevity	(0.15%)
Net discount rate	3.35%

Actuarial Assumptions (cont'd)

Appendix D

This derived net discount rate is to be used in conjunction with projected benefit cash flows based on mortality assumptions as described above, indexed using the plan-specific indexation formula applied to inflation generated by the stochastic model. The resulting median indexation over projection period is equal to 1.47% before age 65 and 1.60% thereafter (based on median inflation of 2.00%).

Comparison with Proxy Basis

The CIA's EN recommends to disclose the liabilities using the Proxy Basis calculated on the basis that there were no capacity constraints. We have, for this purpose, reflected the recommendations for partially-indexed plans included in the CIA's Educational Note, *Assumptions for Hypothetical Wind-Up and Solvency Valuations with Effective Dates Between December 31, 2016 and December 30, 2017*. More specifically, we have used the discount rate for non-indexed annuity pricing assumptions and mortality based on 100% of the rates of the CPM 2014 mortality table projected with improvement Scale B. The indexation assumption was derived from the Mercer's Inflation Model, based on the plan-specific indexation formula, as follows:

- The pension indexation assumption was derived based on the tail end of the distribution of indexation (95th percentile). Such indexation rates are equal to 1.75% before age 65 and 2.02% after age 65 at the valuation date. These rates compare to best estimate median indexation of 1.30% before age 65 and 1.42% after age 65 (based on inflation of 1.70% used under Proxy Basis).

On a solvency basis, the difference between the discount rates for non-indexed pensions (3.10%) and for fully indexed pensions (-0.09%) can be broken down into inflation (1.70%) and an inflation risk premium (1.49%). This premium represents the additional cost over the price that an insurer would charge if costs were based only on the best estimate inflation.

Based on the partial indexation formula applicable under the plan, only a portion of this inflation risk premium is to be included. The portion of the inflation risk premium to be included should reflect the fact that it is mainly the adverse scenarios which lead insurers to apply an inflation risk premium. The cap and percentages applicable under the indexation formulas would provide protection to an insurer against the most extreme scenarios. To adjust for the effect of the percentages and caps on the annuity pricing, we have reflected a portion but not all of the inflation risk premium through the higher indexation rates.

Also for comparison purposes, we have determined what would be the equivalent discount rate if an approach consistent with the Proxy Basis had been used as at December 31, 2016. For this purpose, mortality is based on the CIA's Educational Note, *Assumptions for Hypothetical Wind-Up and Solvency Valuations with Effective Dates Between December 31, 2016 and December 30, 2017* and pension indexation assumption is equal to the one used under the Proxy Basis. The resulting discount rate equals 3.83%.

Actuarial Assumptions (cont'd)

Appendix D

The comparison is as follows:

	Replicating Portfolio ("RP") assumptions	Proxy Basis	RP Corresponding assumptions under Proxy Basis
Discount rate	3.35%	3.10% ⁽¹⁾	3.83%
Indexation rate	1.47% before age 65, 1.60% thereafter	1.75% before age 65, 2.02% thereafter	1.75% before age 65, 2.02% thereafter
Mortality table:			
Females	115% of the rates of the CPM 2014 Private Sector Mortality Table projected with Improvement Scale B	100% of the rates of the CPM 2014 projected with Improvement Scale B	100% of the rates of the CPM 2014 projected with Improvement Scale B
Males	80% of the rates of the CPM 2014 Private Sector Mortality Table projected with Improvement Scale B	100% of the rates of the CPM 2014 projected with Improvement Scale B	100% of the rates of the CPM 2014 projected with Improvement Scale B
Liability for members eligible to immediate pension	\$13,829 million	\$15,124 million	\$13,829 million

⁽¹⁾ Determined as the unadjusted CANSIM V39062 (2.21%) increased arithmetically by a spread of 89 bps, based on the duration of the liabilities expected to be settled through the purchase of annuities of 10.9

Membership Data**Appendix E**

Source of Data

Data was extracted from the Benefits Administrator's database as at December 31, 2016. Data was provided for active members, members on special leaves, transferred members, pensioners, beneficiaries, terminated members entitled to a deferred pensions and outstanding payments.

Data Validation Tests

Tests were made to ensure that the data was consistent both internally and with prior valuation data. More specifically, we have:

- confirmed membership movements between valuation dates;
- validated dates, codes and amounts; and
- verified the consistency of service and earnings data with previous years.

In our opinion, these tests indicated that the data was sufficient and reliable for the purposes of the valuation. No assumptions were necessary with respect to incomplete data. The Plan sponsor has stated that the membership data is complete and accurate (Appendix K).

Appendix E

Membership Data (cont'd)

Membership Reconciliation – Active Members accruing DB service

	<u>BELL</u>	<u>EXPERTECH</u>	<u>MOBILITY</u>	<u>BELL TV</u>	<u>MEDIA</u>	<u>TOTAL</u>
Number as at 2015/12/31	10,662	663	1,278	32	12	12,647
Rehired	2	-	-	-	-	2
Transfers						
- From another plan/participating company	27	4	10	3	2	46
- To another plan/participating company	(18)	(6)	(18)	(4)	(1)	(47)
Transfers (with past entitlements remaining in the Plan)						
- Members transferred back into the Plan	7	-	-	-	-	7
- Members transferred out of the Plan	-	-	(1)	-	-	(1)
Terminations						
- Paid out	(52)	(1)	(41)	-	(2)	(96)
- Deferred Pension	(84)	(3)	(37)	-	-	(124)
Retirements	(1,397)	(92)	(25)	-	(1)	(1,515)
Deaths						
- With a survivor pension	(5)	-	-	-	-	(5)
- Paid out	(24)	(1)	(2)	-	-	(27)
Data Correction	-	(1)	-	-	-	(1)
Number as at 2016/12/31	9,118	563	1,164	31	10	10,886 ⁽¹⁾

⁽¹⁾ Includes 793 disabled members

Membership Data (cont'd)

Appendix E

Membership Reconciliation - Active Members accruing DC benefits (with past DB service)

	<u>BELL</u>	<u>EXPERTECH</u>	<u>MOBILITY</u>	<u>BELL TV</u>	<u>MEDIA</u>	<u>TOTAL</u>
Number as at 2015/12/31	1,124	54	300	2	4	1,484
Rehired	-	1	-	-	-	1
Transfers						
- From another plan/participating company	7	1	2	-	-	10
- To another plan/participating company	(7)	(2)	(5)	-	-	(14)
Transfers (with past entitlements remaining in the Plan)						
- Members transferred back into the Plan	-	-	-	-	-	-
- Members transferred out of the Plan	-	-	-	-	-	-
Terminations						
- DB Service : Paid out						
- DC Benefits : Paid out	(15)	(1)	(12)	-	(1)	(29)
- DC Benefits : Not paid out	(2)	-	-	-	-	(2)
- DB Service : Deferred Pension						
- DC Benefits : Paid out	(6)	-	(3)	-	-	(9)
- DC Benefits : Not paid out	(12)	-	(7)	-	-	(19)
Retirements						
- DC Benefits : Paid out	(3)	(1)	(1)	-	-	(5)
- DC Benefits : Not paid out	(5)	-	-	-	-	(5)
Deaths						
- DB Service : Paid out						
- DC Benefits : Paid out	-	-	-	-	-	-
- DC Benefits : Not paid out	(1)	-	-	-	-	(1)
- DB Service : Survivor Pension						
- DC Benefits : Paid out	-	-	-	-	-	-
- DC Benefits : Not paid out	-	-	-	-	-	-
Data Correction						
	-	1	-	-	-	1
Number as at 2016/12/31	1,080	53	274	2	3	1,412 ⁽¹⁾

⁽¹⁾ Includes 50 disabled members

Appendix E

Membership Data (cont'd)

Membership Reconciliation – Active Members accruing DC benefits (without past DB service)

	<u>BELL</u>	<u>EXPERTECH</u>	<u>MOBILITY</u>	<u>BELL TV</u>	<u>MEDIA</u>	<u>ONTERA</u>	<u>TOTAL</u>
Number as at 2015/12/31	6,696	564	2,892	765	6,900	89	17,906
New Members and Rehired	1,081	99	484	15	826	4	2,509
Transfers							
- From another plan/participating company	980 ⁽¹⁾	1	27	2	107	-	1,117
- To another plan/participating company	(42)	(5)	(63)	(16)	(13)	(81)	(220)
Terminations							
- Paid out	(453)	(16)	(365)	(119)	(763)	(11)	(1,727)
- Not paid out	(428)	(18)	(206)	(55)	(445)	-	(1,152)
Deaths							
- Paid out	-	-	-	(2)	(1)	(1)	(4)
- Not paid out	(4)	-	(1)	-	(5)	-	(10)
Number as at 2016/12/31	7,830	625	2,768	590	6,606	-	18,419

⁽¹⁾ Includes 900 managers of the Bell Aliant Defined Contribution Plan transferred to the DC Component of the Plan on October 1, 2016

Appendix E

Membership Data (cont'd)

Membership Reconciliation – Members transferred out of the Plan for future benefit accrual, with past DB service and liabilities remaining in the Plan

	<u>BELL</u>	<u>EXPERTECH</u>	<u>MOBILITY</u>	<u>BELL TV</u>	<u>MEDIA</u>	<u>TOTAL</u>
Number as at 2015/12/31	761	-	1	-	-	762
New Members transferred out of the Plan	-	-	1	-	-	1
Members transferred back into the Plan ⁽¹⁾	(7)	-	-	-	-	(7)
Past DB service transferred out of the Plan	(75)	-	-	-	-	(75)
Terminations						
- Paid out	(1)	-	-	-	-	(1)
- Deferred Pension	-	-	-	-	-	-
Retirements						
Death						
- With a survivor pension	(1)	-	-	-	-	(1)
- Paid out	-	-	-	-	-	-
Number as at 2016/12/31	676	-	2	-	-	678 ⁽²⁾

⁽¹⁾ Headcount recognized in the active membership

⁽²⁾ Includes 9 disabled members

Appendix E

Membership Data (cont'd)

Membership Reconciliation – Pensioners and Beneficiaries (DB Component)

	<u>BELL</u>	<u>EXPERTECH</u>	<u>MOBILITY</u>	<u>BELL TV</u>	<u>MEDIA</u>	<u>TOTAL</u>
Number as at 2015/12/31	32,786	977	288	3	-	34,054
New Retirements from						
- Active members	1,411	93	26	-	1	1,531
- Deferred Pensions	81	3	4	-	-	88
- Deceased active members	-	-	-	-	-	-
- Transferred members	1	-	-	-	-	1
End of guarantee period	(7)	(1)	-	-	-	(8)
Deaths (no further benefits)	(625)	(2)	(1)	-	-	(628)
Small pension refunded	-	-	-	-	-	-
Data corrections	5	2	-	-	-	7
Number as at 2016/12/31	33,652	1,072	317	3	1	35,045

Appendix E

Membership Data (cont'd)

Membership Reconciliation – Members entitled to Deferred Pensions (DB Component)

	<u>BELL</u>	<u>EXPERTECH</u>	<u>MOBILITY</u>	<u>BELL TV</u>	<u>MEDIA</u>	<u>TOTAL</u>
Number as at 2015/12/31	5,300	153	1,084	30	4	6,571
New Deferred Pensions						
- Active members	102	3	47	-	-	152
- Transferred members	-	-	-	-	-	-
Past service transferred to another plan	-	-	-	-	-	-
Rehired as Active members	(1)	(1)	-	-	-	(2)
Paid out	(139)	(7)	(44)	(3)	(1)	(194)
Retirements	(81)	(3)	(4)	-	-	(88)
Deaths (paid out)	(7)	-	(1)	-	-	(8)
Data corrections	4	-	1	-	-	5
Number as at 2016/12/31	5,178	145	1,083	27	3	6,436

Membership Data (cont'd)

Appendix E

Membership Reconciliation - Former Members with DC Benefits not paid out or not yet transferred to another plan

	<u>BELL⁽¹⁾</u>	<u>EXPERTECH</u>	<u>MOBILITY</u>	<u>BELL TV</u>	<u>MEDIA</u>	<u>TOTAL</u>
Number as at 2015/12/31	1,844	29	1,004	403	564	3,844
New						
- from termination	442	18	213	55	445	1,173
- from death	5	-	1	-	5	11
- from retirement	5	-	-	-	-	5
- from transfer out	90	-	3	-	6	99
Transfers						
- From another plan/participating company	4	2	-	-	4	10
- To another plan/participating company	(2)	-	(3)	(2)	(1)	(8)
Paid out	(224)	(3)	(156)	(94)	(203)	(680)
Rehired	(32)	(4)	(5)	-	(23)	(64)
Data Corrections	5	-	-	-	2	7
Number as at 2016/12/31	2,137	42	1,057	362	799	4,397

⁽¹⁾ Reconciliation includes Members of ONTERA for which their DC accounts have not yet been transferred as at December 31, 2016

Appendix E

Membership Data (cont'd)

Data Summary – Active Members

	December 31, 2016					December 31, 2015	
	BELL	EXPERTECH	MOBILITY	BELL TV	MEDIA	TOTAL	TOTAL
Active Members							
<u>Members accruing DB service</u>							
Number	9,118	563	1,164	31	10	10,886	12,647
Average age	51.1	50.7	47.4	48.5	46.3	50.7	50.6
Average DB pensionable service	24.7	23.1	17.7	18.7	18.3	23.8	24.1
Average pensionable earnings	\$79,357	\$70,869	\$78,687	\$82,852	\$129,699	\$78,903	\$77,438
<u>Members accruing DC benefits (with past DB service)</u>							
Number	1,080	53	274	2	3	1,412	1,484
Average age	44.6	46.0	43.3	42.7	49.9	44.4	43.5
Average DB pensionable service	6.2	6.9	3.3	0.2	1.5	5.6	5.7
Average pensionable earnings	\$85,118	\$70,211	\$77,950	\$79,456	\$105,890	\$83,204	\$81,385
<u>Members accruing DC benefits (without past DB service)</u>							
Number	7,830	625	2,768	590	6,606	18,419	17,906
Average age	39.9	35.8	37.5	40.3	41.3	39.9	39.6
Average pensionable earnings	\$80,426	\$61,127	\$68,138	\$56,310	\$75,470	\$75,375	\$73,290
Total							
Number	18,028	1,241	4,206	623	6,619	30,717	32,037
Average age	45.8	43.0	40.6	40.7	41.3	43.9	44.1
Average pensionable earnings	\$80,166	\$65,935	\$71,697	\$57,705	\$75,566	\$76,985	\$75,303

Appendix E

Membership Data (cont'd)

Data Summary – Inactive Members

	December 31, 2016					December 31, 2015	
	BELL	EXPERTTECH	MOBILITY	BELL TV	MEDIA	TOTAL	TOTAL
Pensioners							
Number	30,705	1,026	306	3	1	32,041	31,176
Average age	71.0	63.9	66.8	60.6	-	70.7	70.6
Average annual pension	\$23,407	\$28,523	\$16,978	\$26,440	-	\$23,509	\$23,092
Beneficiaries							
Number	2,947	46	11	-	-	3,004	2,878
Average age	77.7	63.9	80.5	-	-	77.5	77.1
Average annual pension	\$16,787	\$16,099	\$4,598	-	-	\$16,732	\$16,411
Members Entitled to Deferred Pensions							
Number	5,178	145	1,083	27	3	6,436	6,571
Average age	51.6	46.0	45.5	46.0	44.7	50.4	49.6
Average annual pension	\$5,648	\$5,366	\$4,688	\$6,035	\$4,452	\$5,481	\$5,571
Former DC Members⁽¹⁾							
Number	2,137	42	1,057	362	799	4,397	3,844
Average DC account	\$18,003	\$11,035	\$13,420	\$13,407	\$16,074	\$16,106	\$14,510

⁽¹⁾ With DC Benefits not paid out or not yet transferred to another plan

Appendix E

Membership Data (cont'd)

Age/Service Chart of Active Members accruing DB service as at December 31, 2016

Age \ DB Service	0 - 5	5 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 and +	TOTAL
30 - 35 : #		1	59	3						63
Total earnings		4,085,378	269,200							4,448,513
Average earnings		69,244	89,733							70,611
35 - 40 : #	1	13	343	559	2					918
Total earnings	976,884	25,909,000	45,417,654	121,590						72,442,906
Average earnings	75,145	75,536	81,248	60,795						78,914
40 - 45 : #	2	28	253	1,023	167	8				1,481
Total earnings	61,188	2,206,396	19,206,708	82,945,057	14,167,592	555,967				119,142,908
Average earnings	30,594	78,800	75,916	81,080	84,836	69,496				80,448
45 - 50 : #	3	29	192	738	496	587	21			2,066
Total earnings	178,722	2,532,872	15,032,249	58,461,099	41,275,773	47,872,853	1,641,553			166,995,121
Average earnings	59,574	87,340	78,293	79,216	83,217	81,555	78,169			80,830
50 - 55 : #	1	24	132	617	355	1,320	398	342	2	3,191
Total earnings	1,886,271	10,420,777	49,176,243	27,620,228	106,557,935	31,563,797	79,306	26,159,707	168,046	253,646,401
Average earnings	78,595	78,945	79,702	71,803	80,726	79,306	76,490	84,023	84,023	79,488
55 - 60 : #	16	16	80	365	171	543	251	867	76	2,369
Total earnings	1,411,237	6,591,622	28,779,996	40,661,307	12,350,385	40,661,307	20,635,295	66,818,849	5,714,976	182,963,667
Average earnings	88,202	82,395	78,849	74,883	72,224	74,883	82,212	77,069	75,197	77,232
60 - 65 : #	3	3	41	125	75	143	48	198	97	730
Total earnings	214,344	2,914,710	9,805,964	4,850,260	9,998,553	15,528,670	3,513,554	7,267,004	7,267,004	54,093,060
Average earnings	71,448	71,090	78,448	64,670	69,920	78,428	73,199	74,918	74,918	74,100
65 and + : #	1	1	6	26	13	6	1	8	7	68
Total earnings	351,085	9,393,758	84,601,925	276,856,454	101,329,499	206,124,812	57,399,166	109,194,415	13,681,748	858,932,864
Average earnings	50,155	81,685	76,494	80,109	79,226	79,066	79,832	77,169	75,174	78,903
TOTAL										
Total earnings										
Average earnings										

Appendix E

Membership Data (cont'd)

Age/Service Chart of Active Members with past DB service accruing DC benefits as at December 31, 2016

Age \ DB Service	0 - 5	5 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 and +	TOTAL
30 - 35 : #	70	1								71
Total earnings	5,281,414									5,366,878
Average earnings	75,449									75,590
35 - 40 : #	284	88	2							374
Total earnings	24,202,990	7,447,872	152,376							31,803,238
Average earnings	85,222	84,635	76,188							85,035
40 - 45 : #	213	145	14	3						375
Total earnings	18,118,069	12,681,076	1,322,490	219,213						32,340,848
Average earnings	85,061	87,456	94,464	73,071						86,242
45 - 50 : #	124	80	36	24	3					267
Total earnings	9,989,173	6,464,037	2,901,055	2,898,469	243,139					22,495,873
Average earnings	80,558	80,800	80,585	120,770	81,046					84,254
50 - 55 : #	81	51	36	34	17	2				221
Total earnings	7,116,107	3,899,419	2,882,580	2,585,517	1,253,751	136,385				17,873,759
Average earnings	87,853	76,459	80,072	76,045	73,750	68,193				80,877
55 - 60 : #	27	15	9	12	7	7				70
Total earnings	1,963,467	1,133,302	611,872	849,378	769,591	5,327,610				109,942
Average earnings	72,721	75,553	67,986	70,782	109,942	76,109				76,109
60 - 65 : #	15	10	4	1	1	1				31
Total earnings	1,010,094	688,072	221,708	1	1	2,066,493				66,661
Average earnings	67,340	68,807	55,427			66,661				66,661
65 and + : #	2	1								3
Total earnings	170,206									208,962
Average earnings	85,103									69,654
TOTAL	816	391	101	74	20	10				1,412
Total earnings	67,851,519	32,437,998	8,092,080	6,619,415	1,496,891	985,758				117,483,661
Average earnings	83,151	82,962	80,120	89,452	74,845	98,576				83,204

Appendix E

Membership Data (cont'd)

Chart of Active Members accruing benefits in the DC Component as at December 31, 2016

Member	Contribution level	BELL		EXPERTECH		MOBILITY		BELL TV		MEDIA		TOTAL	
		#	avg. pens. earnings	#	avg. pens. earnings	#	avg. pens. earnings	#	avg. pens. earnings	#	avg. pens. earnings	#	avg. pens. earnings
0.0%	4.0%	710	\$62,131	102	\$44,288	337	\$57,328	86	\$48,872	641	\$47,518	1,876	\$54,697
0.0%	5.0% ⁽¹⁾	7	\$43,105	1	-	3	\$37,717	-	-	58	\$54,383	69	\$52,716
1.0%	5.0%	53	\$73,944	1	-	27	\$55,480	7	\$52,820	49	\$66,082	137	\$65,946
0.0%	6.0% ⁽¹⁾	75	\$51,781	4	\$64,975	29	\$43,725	17	\$38,158	34	\$75,185	159	\$54,192
2.0%	6.0%	4,708	\$82,540	344	\$64,195	1,742	\$70,572	371	\$58,396	3,372	\$74,937	10,537	\$76,679
3.0%	6.0%	452	\$81,546	20	\$62,186	164	\$67,540	20	\$55,857	576	\$75,989	1,232	\$76,352
4.0%	6.0%	1,614	\$82,790	157	\$66,256	432	\$73,028	62	\$58,829	1,195	\$88,674	3,460	\$82,424
5.0%	6.0%	254	\$84,092	6	\$68,598	54	\$64,626	5	\$62,576	165	\$76,637	484	\$78,964
6.0%	6.0%	548	\$83,287	19	\$69,009	129	\$72,466	16	\$58,978	319	\$85,760	1,031	\$82,058
7.0% - 12.0% ⁽²⁾	6.0%	489	\$88,686	24	\$67,444	125	\$74,925	8	\$59,279	200	\$85,215	846	\$84,951
	Total	8,910	\$80,995	678	\$61,838	3,042	\$69,021	592	\$56,388	6,609	\$75,484	19,831	\$75,932

⁽¹⁾ These contribution levels are due to Members on leave

⁽²⁾ The average contribution level is 9.8% for Members contributing between 7.0% and 12.0% of their pensionable earnings

Appendix E

Membership Data (cont'd)

Chart of Pensioners and Beneficiaries as at December 31, 2016

Age Group	Average annual lifetime pension			Average temporary annual pension to 65		
	Number	(\$)	% of members with a survivor protection	Number	(\$)	
<60	3,555	21,307	62%	2,697	20,074	
60-64	6,584	20,105	63%	4,477	18,104	
65-69	7,553	18,855	57%	-	-	
70-74	6,016	18,059	52%	-	-	
75-79	4,352	18,104	40%	-	-	
80-84	3,526	19,615	33%	-	-	
>85	3,459	17,690	13%	-	-	
Total	35,045	19,070	49%	7,174	18,845	

Actuarial Cost Method**Appendix F**

The purpose of an actuarial cost method is to assign a value to the benefits accrued to the valuation date under the plan and to measure the value of the benefits accruing in ensuing years. This actuarial valuation of the DB Component uses two cost methods: the Projected Unit Credit method for the measure of the plan's going-concern liabilities and normal actuarial cost and the Unit Credit method for the solvency measure. A comparison of plan assets with the liabilities measured under these two methods gives an indication of the security of benefits accrued to the valuation date based on the actuarial assumptions described in this report.

Going-Concern Basis: Projected Unit Credit Actuarial Cost Method

Prospective benefits were calculated for each active and transferred member according to the actuarial assumptions shown in Appendix D. The actuarial liability for each active and transferred member was calculated as the actuarial present value of the prospective benefits multiplied by the ratio of the pensionable service prior to the valuation date to the total potential pensionable service.

The normal actuarial cost for each active member was calculated as the actuarial present value of the prospective benefits divided by the total potential pensionable service. In order to reflect the fact that, on average, contributions are made in the middle of the year, six months of interest at the valuation interest rate assumption was added to the normal actuarial cost.

The actuarial liability for each inactive member was calculated as the actuarial present value of their respective benefits.

Solvency Basis: Unit Credit Actuarial Cost Method

The actuarial liability for each member was calculated as the actuarial present value of their accrued benefits at the valuation date (determined on the basis of current earnings for active and transferred members).

The actuarial liability for members not in receipt of a pension payment at the valuation date was calculated as the present value of the pension deferred to the age that maximizes the value.

Incremental Cost

For active members, transferred members and deferred pensioners, the cost has been determined by calculating the present value of the projected solvency liability at the next valuation date, taking into account accrual of service, projection of pensionable earnings and maximum pension limit, benefits based on eligibility at that time and the reset of the select period in the discount rate assumption, if and when applicable, minus the solvency liability at the valuation date. Decrements prior to normal retirement date have been ignored, considering materiality, and no new entrants have been assumed since participation in the Plan is closed to new employees.

For members in receipt of a pension payment at the valuation date, the incremental cost is equal to 0 since all benefits are already reflected in the liability at the valuation date.

Minimum Contribution Requirements

Appendix G

The Pension Benefits Standards Act, 1985 and the related Regulations require that certain minimum contributions be made for a plan to remain acceptable for registration. These minimum contributions are the sum of:

- the employer normal actuarial cost
- the going-concern amortization payments

The going-concern amortization payments must be sufficient to liquidate the unfunded actuarial liability over a period of fifteen years, where an unfunded actuarial liability is:

- the going-concern deficit upon plan establishment;
- the amount by which a plan amendment increases going-concern liabilities above any existing going-concern excess of the plan; or
- the amount by which the going-concern deficit exceeds the present value of previously established going-concern amortization payments in respect of periods after the valuation date.

Actuarial gains may be used to reduce any outstanding unfunded actuarial liability.

- the solvency amortization payments

The plan year's solvency amortization payment is equal to the amount by which the solvency deficiency (amount by which the solvency liabilities exceed the adjusted solvency asset amount) divided by 5 exceeds the going-concern amortization payments payable during the plan year. Letters of credit can be deposited into the pension fund in lieu of making cash payments to amortize the solvency deficiency, up to a maximum of 15% of plan assets.

The minimum contributions are payable not less frequently than monthly and not later than 30 days after the end of the period for which they are payable.

Employer contributions in respect of the normal actuarial cost may be reduced by the lesser of the surplus on a going-concern basis and the excess of the solvency assets over 105% of the solvency liability.

Maximum Eligible Contributions**Appendix H**

In its fiscal year an employer may deduct contributions and certain administrative costs of a registered pension plan in accordance with the Income Tax Act.

Section 147.2 permits the deduction of contributions in respect of the employer normal actuarial cost. It also permits the deduction of the amortization payments up to the greater of (a) any unfunded actuarial liability, (b) the face value of any letter of credit plus/minus the solvency shortfall/surplus, or (c) any required solvency amortization payments. Contributions are subject to certification by the actuary (prepared not more than four years before the day on which the contribution is made) and approval by the Canada Revenue Agency.

These contributions are deductible in the fiscal year during which they are remitted or within 120 days after the end of such fiscal year provided they were made to fund benefits for periods before the end of the fiscal year.

Interpretation Bulletin IT-105 permits the deduction of the administrative costs of the Plan.

If the actuarial surplus exceeds 25% of the actuarial liability, then the employer's normal actuarial cost must be reduced to the extent of such excess. It should be noted that this provision of the tax rules limits the amount of employer contribution which may be made, not just the deductibility of contributions.

Statutory Filings**Appendix I****Office of the Superintendent of Financial Institutions**

An actuarial valuation report must generally be filed annually with OSFI unless the solvency ratio disclosed in the most recently filed valuation report is 1.20 or greater. In this later case, an actuarial valuation report must be filed at least every three years, or whenever the plan funding requirements are changed. In the intervening period, the employer must contribute, as a minimum, according to the last filed actuarial opinion. An Actuarial Information Summary and a Replicating Portfolio Information Summary must be filed concurrently with the actuarial valuation.

Given the solvency ratio of the Plan, the actuarial opinion contained in this report is only valid for 2017 and the next valuation report must have a valuation date no later than December 31, 2017.

Canada Revenue Agency

To make an eligible contribution, an employer must seek the Minister of Finance's approval. Accordingly, the employer must file with the Minister a report prepared by the actuary that contains a certification and any other required information. The recommendation must be based on an actuarial valuation with an effective date not more than four years before the day on which the contribution is made and must be approved in writing by the Minister on the advice of the Superintendent of Financial Institutions. An Actuarial Information Summary must be filed concurrently with the actuarial valuation.

Summary of Plan Provisions

Appendix J

The following is a summary of the Plan's main provisions in effect as at December 31, 2016. It is not a complete description of the Plan provisions.

Eligibility for Membership

All Employees become Members of the Plan after they have completed three months of service.

Pensionable Earnings

Basic pay plus short-term incentive bonus and other forms of remuneration that are considered to be earnings for pension purposes under the applicable rules of the relevant Participating Company.

Vesting

Immediate upon Plan membership.

DC COMPONENT

The Plan provides for defined contribution provisions for all new employees hired and for active Members who elected to join the DC Component.

Any benefits provided under the DC Component are in addition to the benefits provided under the DB Component. Members shall not accrue Pensionable Employment while participating in the DC Component of the Plan.

Members are allowed to contribute up to 12% of Pensionable Earnings, on an optional basis. Employer contributions under the DC Component of the Plan are 4% of Pensionable Earnings, plus a matching of member contributions up to a maximum of 2% of Pensionable Earnings.

Employer and Member contributions are invested in accordance with Members' selection of investment options. At termination of employment, death or retirement, the Member's DC account is payable in the form of a lump sum transfer, subject to applicable legislation.

DB COMPONENT

Member Contributions

None.

Pensionable Age

Age 65.

Early Retirement Date

In respect of Pensionable Employment prior to January 1, 1987

- > Age 55 and sum of age and years of service equal to 85 or more, or
- > Age 60 and sum of age and years of service equal to 80 or more.

If not eligible under the above criteria, an actuarially reduced benefit is payable from age 55.

In respect of Pensionable Employment from January 1, 1987

Age 55.

Members terminating employment after having attained age 55 shall be granted an annual pension (portability option not offered).

Summary of Plan Provisions (cont'd)

Appendix J

Average Annual Pensionable Earnings (AAPE)

Average annual Pensionable Earnings during the best 60 consecutive months.

Defined Benefit Pension

- 1) In respect of Pensionable Employment prior to January 1, 1987
(except for members of the BCE Mobile Communications Inc. Pension Plan as at December 31, 2000)

The pension under this section is converted into a level pension on an actuarial equivalent basis. For each year of Pensionable Employment prior to January 1, 1987, the amount of Annual Pension payable upon retirement is equal to the following:

- a) Prior to age 65:
- i. 1.30% plus 0.01% for each 3 full months by which retirement age exceeds age 55 (up to a maximum of 1.50%) times AAPE, and
 - ii. a supplemental amount of 0.50% of the lesser of AAPE and \$10,000.
- b) On and after age 65:
- i. 0.85% of AAPE, up to the Year's Maximum Pensionable Earnings (YMPE) under the C/QPP for the year in which the pension commences, and
 - ii. 1.30% plus 0.01% for each 3 full months by which retirement age exceeds age 55 (up to a maximum of 1.50%) times the amount by which the AAPE exceeds the YMPE

- 2) In respect of Pensionable Employment from January 1, 1987
(or in respect of all Pensionable Employment for members of the BCE Mobile Communications Inc. Pension Plan as at December 31, 2000)

For each year of Pensionable Employment from January 1, 1987, the amount of annual pension payable from Pensionable Age shall be equal to the sum of:

- i. 1.0% of that part of the Member's AAPE which does not exceed the YMPE, and
- ii. 1.7% of that part of the Member's AAPE in excess of the YMPE

Pension is reduced by ¼% for each month that Early Retirement Date precedes Pensionable Age.

- 3) Additional Pension for Members who elected to participate in the DC Component of the Plan

The amount of additional annual pension payable from Pensionable Age shall be equal to 0.2% of that part of the Member's AAPE which does not exceed the YMPE for each year of Pensionable Employment before January 1, 2005. Such additional pension is reduced by ¼% for each month that Early Retirement Date precedes Pensionable Age.

Maximum Pension

No annual pension payable according to the defined benefit provisions upon retirement, death or termination of employment can exceed the limit determined under the Income Tax Act and 2% of the Member's AAPE times the number of years of Pensionable Employment.

Normal Form of Pension

Pension payable for life with no guarantee.

Summary of Plan Provisions (cont'd)

Appendix J

Optional Form of Pension

Pension payable for life with a 10-year guarantee, on an actuarially reduced basis.

Survivor Protection After Retirement

Unless waived in writing prior to retirement, the defined benefit pension is payable in reduced amounts (on an actuarial equivalent basis) such that, in the event of the former employee's death, a survivor pension equal to 60% of the reduced pension will be paid for life to the eligible spouse.

In the case of Members Entitled to Protection of Pension Rights:

- a) if the spouse dies prior to the former employee, the normal pension is reinstated to the initial amount;
- b) the actuarial equivalent reduction is made on the basis that the Fund will subsidize one-third of the pension to the surviving spouse.

Death Benefits Before Retirement

- a) On the death of a Member, the surviving spouse is entitled to a benefit equal in value to the defined benefit pension.
- b) If the Member has no spouse on the date of death, the beneficiary or the estate is entitled to a benefit equal in value to the defined benefit pension.

Termination Benefits

In respect of defined benefit pension credits for service prior to January 1, 1987

Deferred annuities payable from age 60 are provided.

In respect of pension credits for service from January 1, 1987 (or all service for Mobility employees):

Deferred annuities payable from age 65 are provided.

Indexing of Pensions

All defined benefit pensions under the Plan will be augmented by annual cost-of-living adjustments, not to exceed 2% per year, based on the increase in the Consumer Price Index ("CPI") as published by Statistics Canada.

From age 65, if it is more generous than the formula described above, all pensions under the Plan will be augmented by annual cost-of-living adjustments, not to exceed 4% per year, corresponding to 60% of the annual increase in the CPI.

Protection of Pension Rights

Employees on December 31, 1986 who have maintained continuous employment are entitled, for their service on or after January 1, 1987, to the larger of the benefits calculated in accordance with the provisions applicable to pre-1987 service and the benefits calculated in accordance with the provisions applicable to post-1986 service. Members of the BCE Mobile Communications Inc. Pension Plan as at December 31, 2000 other than qualified members are not entitled to this protection.

Summary of Plan Provisions (cont'd)**Appendix J****Pay Equity Accounts**

Bell Canada entered into agreements on pay equity with the Canadian Telecommunications Employees' Association (CTEA) in 2002 and with the Communications, Energy and Paperworkers Union of Canada (CEP) in 2005. Certain affected employees were granted retroactive pay as well as a pension improvement consisting of a lump sum benefit which accumulates at the rate of return of the DB Component of the Plan.

Disability Benefits

A Member on Long Term Disability continues to accrue pensionable service while disabled to the earliest of age 65, retirement, termination or death.

Certificate of the Employer**Appendix K**

I hereby certify that, with respect to the actuarial valuation of the Bell Canada Pension Plan as at December 31, 2016, to the best of my knowledge and belief,

- the valuation reflects Bell Canada's terms of engagement, including the requirement to include a margin in the discount rate used to perform the going-concern valuation and regarding the methodology to value solvency liabilities;
- the information supplied to the actuary related to the Plan provisions, the membership data, and the asset data is complete and accurate; and
- all events subsequent to December 31, 2016 that may have an impact on the Plan have been communicated to the actuary.



Signature

June 2017

Date

Eleanor Marshall

Name

Vice President - Pension & Benefits

Title

*THIS IS EXHIBIT "E" REFERRED TO IN THE
AFFIDAVIT OF JASMINE RANDHAWA
SWORN BEFORE ME, THIS 23 DAY OF JULY, 2018*



A COMMISSIONER FOR TAKING AFFIDAVITS, ETC.

Brittany Tovee



Eric Deslainers, Bell Canada BELL (Combo:55077) (P-B002) (Change)

English/Anglais

Return Name OSFI49 - Annual Information Return
 Section Name A20010 - A20016
 Organization Name Bell Canada BELL (Combo:55077) (P-B002)
 Reporting Date 2016-12-31

When completing this form, please refer to the Guide to Completing the OSFI 49 Annual Information Return and the OSFI 49A Schedule A - Canada Revenue Agency Information Requirements.

20.010

045	Period of this report	From 001	2016-01-01	To 002	2016-12-31	Number of Months 003	12
			YYYY-MM-DD		YYYY-MM-DD		

20.012

Line	Membership				
				001	
002	Number of members at the plan's previous year end			32799	
003	ENTRANTS: (Include employees joining the plan and transfers from other plans)			3,694	
005	Total of lines 002 plus (+) 003			36,493	
006	EXITS: Retirement or death			1,574	
008	Termination of membership (include transfers to another plan)			3,524	
009	Total of lines 006 plus (+) 008			5,098	
011	Number of members at plan year end (line 005 minus (-) 009)			31,395	
013	Inactive members: (number of members from line 011 for whom no contributions were made)			762	
Membership by location at the end of the plan year					
		Male	Female	Included Employment	
	Location of Employment	001	002	003	
015	Newfoundland	137	105	242	
016	Prince Edward Island	13	8	21	
017	Nova Scotia	358	235	593	
018	New Brunswick	379	231	610	
019	Quebec	5,900	3,897	9,797	
020	Ontario	10,849	6,936	17,785	
021	Manitoba	119	91	210	
022	Saskatchewan	109	66	175	
023	Alberta	542	329	871	
024	British Columbia	580	407	1,087	
025	Yukon Territory	2	1	3	
028	Northwest Territories				
029	Nunavut				
030	Outside Canada		1	1	
034	Total Male/Female/Included Employment	19,088	12,307	31,395	
035	Total Membership (sum of cols. 001 and 002 on line 034) (Must equal line 11)			31,395	
036	Other Beneficiaries			45,878	
038	Grand Total			77,273	
Current Service Payments remitted for the plan year				\$ Amount 001	

040	Member contributions				25,531,000
042	Additional voluntary contributions				13,495,000
044	Total member contributions (line 040 plus (+) line 042)				39,026,000
045	Employer current service contributions (determined from plan documents or actuarial valuation report)				215,900,000
047	Amount credited from surplus/forfeitures				0
049	Net employer current service contributions (line 045 minus (-) line 047)				215,900,000
Contribution Base – Complete (a) or (b), and (c)					
050	(a) Total payroll of plan members (by contribution class)	Class 001	DB	Payroll 002 \$	979,300,000
051		Class 001	DC	Payroll 002 \$	1,433,100,000
054	(b) Describe base if other than payroll 001				
055	(c) Were employer contributions the result of a collective agreement? 001	No			
Collective bargaining agent representing the largest number of pension plan members, if applicable					
056	001	Expiry date of collective agreement 002		YYYY-MM-DD	
20.014					
This page is for Defined Benefit/Combination plans only					
Amount of Special Payments paid into the pension fund					
Line					\$ Amount 001
001	Total annual unfunded liability payment(s)				
002	Total annual solvency deficiency payment(s)				3,276,000
003	Other special payment(s)				350,000,000
005	Total of all special payment(s)				353,276,000
If adjustments were made to pensions in pay during the year, please check the appropriate boxes below. If no adjustments were made, proceed to page 20.016.					
Reason for the adjustment(s)					
		001			
015	Yes	Regular inflation adjustment of benefits as required by the plan documents			
016	No	Pursuant to a collective agreement			
017	No	Voluntarily by the employer			
018	No	Other (explain below)			
019					
The basis for the adjustment(s)					
		001			
020	No	Full Consumer Price Index			
022	No	Partial Consumer Price Index			
027	No	Excess interest formula (adjustments based on excess earnings in the pension fund)		002	
028	No	Percentage increase (not based on CPI)			%
030	No	Flat dollar amount			\$ annually
033	Yes	Other (explain below)			
035		Before age 65: CPI max 2%, after age 65: (60% CPI max 4%) not less than (CPI max 2%)			
20.016					
Amendments					
Line	Were any amendments made to the plan during the year?	If "Yes", have the amendments been submitted to OSFI?			
003	Yes	Yes			

Comments on or explanations of answers given in any of the above sections.	
010	001

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Enc Deslauriers, Bell Canada BELL (Combo:55077) (P-B002) (Change)

English/Anglais

Return Name OSFI49A - Schedule A Canada Revenue Agency Information Requirements

Section Name A20018 - A20018

Organization Name Bell Canada BELL (Combo:55077) (P-B002)

Reporting Date 2016-12-31

When completing this form, please refer to the Guide to Completing the OSFI 49 Annual Information Return and the OSFI 49A Schedule A - Canada Revenue Agency Information Requirements.

SCHEDULE A

CANADA REVENUE AGENCY INFORMATION REQUIREMENTS

20.018

001 Canada Revenue Agency Registration Number

001 0222075

Financial data for the plan year (report amounts to the nearest dollar)

002 Payments of benefits

001 783,999,000

005 Transfers of benefits to other plans

001 155,195,000

007 Amounts transferred in from other plans during the year

001 141,715,000

010 Did the pension plan terminate or become inactive before or in this plan year?

No

013 If yes, enter effective date

- For inactive or terminated plans, no further questions

020 How many members were persons connected with the employer?

001 0

025 How many employers participated in the plan at the end of the plan year?

001 5

- For specified multi-employer plans, no further questions
- For multi-employer plans, go to line 050
- For all other plan types, continue with line 030

030 Did any member of this plan participate in any other registered pension plan or deferred profit sharing plan provided by this plan sponsor?

No

035 Did any member of this plan participate in any other registered pension plan or deferred profit sharing plan of any other sponsor who does not deal at arm's length with this plan sponsor?

Yes

040 Have any connected persons joined or left the plan in this plan year?

No

045 During this plan year, has a person or group acquired control of the corporation that is sponsoring the pension plan?

NA/Yes/No No

- For defined contribution plans, no further questions
- For all other plan types, continue with line 050

050 Were any plan members provided with post-1989 past service benefits in this plan year?

No

055 Have any plan members who are connected persons been provided with pre-1992 past service benefits in this plan year?

No

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Eric Deslauriers, Bell Canada BELL (Combo:55077) (P-B002) ([Change](#))

English/Anglais

Return Name OSFI60 - Certified Financial Statements
 Section Name A30005 - A30035
 Organization Name Bell Canada BELL (Combo:55077) (P-B002)
 Reporting Date 2016-12-31

UNCLASSIFIED
 CERTIFIED FINANCIAL STATEMENTS

Page 30.005

For Plan Year Ending 001 2016-12-31

Number of Months Covered 002 12

Page 30.010

STATEMENT OF CHANGES IN NET ASSETS

INCREASE IN ASSETS	Current Year	Previous Year	
Increase Due to Investments	(\$)	(\$)	
	(001)	(002)	
Investment Income	47,633,000	36517000.00	(010)
Net Gains (or Losses) on Investments			
Realized	0	0.00	(015)
Unrealized	742,784,000	737887000.00	(016)
Total Increase Due to Investments	790,417,000	774404000.00	(019)
<i>(Lines 10+15+16)</i>			
Contributions			
Member Contributions	39,026,000	29860000.00	(020)
Additional Voluntary Contributions		0.00000	(021)
Employer Contributions (current service, special payments, etc.)	566,959,000	462571000.00	(025)
Total Contributions	605,985,000	492431000.00	(029)
<i>(Lines 20+21+25)</i>			
Transfers to the Pension Fund	141,715,000	467192000.00	(039)
Other Sources of Increase	0	0.00	(049)
TOTAL INCREASE IN ASSETS	1,538,117,000	1734027000.00	(059)
<i>(Line 19+29+39+49)</i>			

DECREASE IN ASSETS

Plan Expenses

Expenses Related to Managing Investments	11,448,000	14055000.00	(060)
Administration Cost			
Professional Fees	65,000	65000.00	(070)
Other	25,677,000	27993000.00	(075)
Total Plan Expenses	37,190,000	42113000.00	(079)
<i>(Lines 60+70+75)</i>			
Benefits and Transfers			
Benefits Paid Directly by the Plan	783,999,000	863071000.00	(080)
<i>(Defined Benefit/Combination)</i>			
Transfers from the Pension Fund to:			
Other Registered Pension Plans	29,079,000	32573000.00	(085)
Others Transfers	126,116,000	0.00	(087)
Total Benefits and Transfers	939,194,000	895644000.00	(089)
<i>(Lines 80+85+87)</i>			
Other Sources of Decrease	0	0.00	(109)
TOTAL DECREASE IN ASSETS	976,384,000	937757000.00	(119)
<i>(Lines 79+89+109)</i>			
CHANGE IN NET ASSETS	561,733,000	796270000.00	(129)
<i>(Lines 59-119)</i>			
NET ASSETS AT BEGINNING OF PLAN YEAR	15,988,731,000	15192461000.00	(159)
NET ASSETS AT PLAN YEAR END	16,550,464,000	15988731000.00	(199)
<i>(Lines 129+159)</i>			

Page 30.020

STATEMENT OF NET ASSETS

	Current Year	Previous Year	
	(\$)	(\$)	
	(001)	(002)	
ASSETS			
Cash on Hand	48,277,000	22703000.00	(009)
Investments at Fair Value			
Debt Securities (Canadian and Foreign)			
Short Term Notes, Securities, and Other Term Deposits	100,590,000	183513000.00	(010)
Bonds and Other Debt Securities Guaranteed by a Government	7,307,936,000	6226671000.00	(011)
Corporate Bonds and Other Corporate Debt Securities	3,183,743,000	3052217000.00	(012)
Mutual Funds - Bonds, Cash Equivalent, and Mortgage		0.00	(017)
Mortgage Loans		0.00	(019)
Amounts Deposited in the General Fund of an Insurer		0.00	(024)
Total Debt Securities	10,592,269,000	9462401000.00	(029)
<i>(Lines 10+11+12+17+19+24)</i>			

Equity (Canadian and Foreign)			
Shares in Investment, Real Estate or Resource Corporations		0.00	(030)
Common and Preferred Shares	3,746,291,000	3551984000.00	(033)
Stock Mutual Funds	40,277,000	43612000.00	(034)
Real Estate Mutual Funds	61,806,000	1910000.00	(036)
Real Estate	476,000	476000.00	(037)
Total Equity	3,848,850,000	3597982000.00	(039)
<i>(Lines 30+33+34+36+37)</i>			
Diversified and Other Investments (Canadian and Foreign)			
Balanced Mutual/Pooled Funds	366,304,000	667442000.00	(040)
Segregated Funds	0	0.00	(042)
Hedge Funds	709,605,000	867632000.00	(043)
Private Equity	576,063,000	652556000.00	(044)
Infrastructure	402,971,000	403527000.00	(046)
Other Investments not listed above	79,407,000	300407000.00	(048)
Total Diversified and Other Investments	2,134,350,000	2891564000.00000	(059)
<i>(Lines 40+42+43+44+46+48)</i>			
Total Investments at Fair Value	16,575,469,000	15951947000.00	(069)
<i>(Lines 29+39+59)</i>			
Accounts Receivable			
Member and Additional Voluntary Contributions	73,000	0.00	(070)
Employer Contributions	11,339,000	11280000.00	(071)
Investment Income Receivable	14,241,000	6298000.00	(073)
Other Amounts Receivable	37,061,000	296000.00	(078)
Total Accounts Receivable	62,714,000	17874000.00	(089)
<i>(Lines 70+71+73+78)</i>			
TOTAL ASSETS	16,686,460,000	15992524000.00	(119)
<i>(Lines 09+69+89)</i>			
LIABILITIES			
Mortgage Borrowings		0.00	(125)
Pension Benefits, Refunds and Transfers Payable	1,341,000	0.00	(135)
Expenses Payable	3,147,000	2921000.00	(140)
Other Amounts Payable	131,508,000	872000.00	(148)
TOTAL LIABILITIES	135,996,000	3793000.00	(159)
<i>(Lines 125+135+140+148)</i>			
NET ASSETS AT PLAN YEAR END (Lines 119-159)	16,550,464,000	15988731000.00	(199)

Page 30.035

GENERAL INTERROGATORIES**A. Statement of Investment Policies and Procedures**

Has the Statement of Investment Policies and Procedures been reviewed or amended during the year?

Reviewed: Yes

Amended : Yes

If all assets are held in the segregated funds or unallocated general funds of a Life Insurance Company authorized to carry on business in Canada, answer N/A to B, C, D and E below.

B. 10% Rule

Does the plan comply with the 10% rule described in subsection 9(1) of Schedule III of the Regulations?

Yes / No / NA Yes

C. Securities Lending

Has the plan abided by the February 1992 OSFI Guideline on Securities Lending for Pension Plans?

Yes / No / NA Yes

D. Derivatives - Best Practices

Has the plan abided by the May 1997 OSFI Guideline on Derivatives Best Practices?

Yes / No / NA Yes

E. Foreign Investments

Allocate fair market value of foreign plan assets accordingly: (\$)

Foreign Investments

Type of Investment	US (001)	Europe (002)	Asia (003)	Other Foreign (004)	Total Foreign (005)
Debt Securities					(040)
Equity Securities	1,872,892,000	748,738,000	320,292,000	155,210,000	3,097,132,000 (042)
Other Investments					(044)
Total	1,872,892,000	748,738,000	320,292,000	155,210,000	3,097,132,000 (049)

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*THIS IS EXHIBIT "F" REFERRED TO IN THE
AFFIDAVIT OF JASMINE RANDHAWA
SWORN BEFORE ME, THIS 25 DAY OF JULY, 2018*



A COMMISSIONER FOR TAKING AFFIDAVITS, ETC.

Brittany Tovee

Jasmine Randhawa

From: Deslauriers, Eric <eric.deslaurier@bell.ca>
Sent: January-12-18 7:22 AM
To: Brittany Tovee
Subject: RE: Bell Canada Pension Plan
Attachments: AIR 2016 Bell Canada Pension Plan.pdf

Hi,

This is what I was able to download for the annual information returns.

Eric

Bell

Eric Deslauriers
Senior Consultant – Pension & Actuarial services
1 Alexander G. Bell, Tour A5
Verdun, Quebec H3E 3B3
T : 514 786-7003 F : 514 766-6899

From: Brittany Tovee [mailto:btovee@kmlaw.ca]
Sent: 2018-01-08 5:28 PM
To: Deslauriers, Eric <eric.deslaurier@bell.ca>
Subject: RE: Bell Canada Pension Plan

Thank you!

**KOSKIE
MINSKY**

Brittany Tovee
Associate

T: +1 416-595-2260 | F: +1 416-204-4937 | E: btovee@kmlaw.ca

JUSTICE MATTERS

Koskie Minsky LLP, 20 Queen Street West, Suite 900, Toronto, ON. M5H 3R3
kmlaw.ca

From: Deslauriers, Eric [mailto:eric.deslaurier@bell.ca]
Sent: January-08-18 4:15 PM
To: Brittany Tovee
Subject: RE: Bell Canada Pension Plan

Hi,

As discussed, please find in attachment:
The Bell Canada Actuarial Reports 2016-12-31, The Bell Canada Plan text and
Amendments 20 to 24.

Regards,

Eric

Bell

Eric Deslauriers
Senior Consultant – Pension & Actuarial services
1 Alexander G. Bell, Tour A5
Verdun, Quebec H3E 3B3
T : 514 786-7003 F : 514 766-6899

From: Brittany Tovee [<mailto:btovee@kmlaw.ca>]
Sent: 2018-01-05 2:17 PM
To: Deslauriers, Eric <eric.deslaurier@bell.ca>
Subject: RE: Bell Canada Pension Plan

Mr. Deslauriers,

May I please have a response to our inquiry?

Many thanks,

BT

**KOSKIE
MINSKY**
JUSTICE MATTERS

Brittany Tovee

Associate

T: +1 416-595-2260 | F: +1 416-204-4937 | E: btovee@kmlaw.ca

Koskie Minsky LLP, 20 Queen Street West, Suite 900, Toronto, ON. M5H 3R3

kmlaw.ca

From: Brittany Tovee
Sent: January-02-18 8:24 AM
To: 'Deslauriers, Eric'
Cc: Jasmine Randhawa
Subject: RE: Bell Canada Pension Plan

Thank you for your email, Mr. Deslauriers. I look forward to your response.

BT



Brittany Tovee

Associate

T: +1 416-595-2260 | F: +1 416-204-4937 | E: btovee@kmlaw.ca

Koskie Minsky LLP, 20 Queen Street West, Suite 900, Toronto, ON. M5H 3R3

kmlaw.ca

From: Deslauriers, Eric [<mailto:eric.deslaurier@bell.ca>]

Sent: December-21-17 1:40 PM

To: Brittany Tovee

Cc: 'les.austin les.austin'; Jasmine Randhawa

Subject: RE: Bell Canada Pension Plan

I confirm that we have received your request, and we will get back to you with more information in January 2018.

Regards,

Eric Deslauriers

Eric Deslauriers

Senior Consultant – Pension & Actuarial services

1 Alexander G. Bell, Tour A5

Verdun, Quebec H3E 3B3

T : 514 786-7003 F : 514 766-6899

Vacances : Du 22 décembre 2017 au 4 janvier 2018 inclusivement / Vacation : December 22, 2017 to January 4, 2018 inclusively

From: Jasmine Randhawa [<mailto:jrandhawa@kmlaw.ca>]

Sent: 2017-12-20 11:37 AM

To: Deslauriers, Eric <eric.deslaurier@bell.ca>

Cc: Brittany Tovee <btovee@kmlaw.ca>; 'les.austin les.austin' <les.austin@sympatico.ca>

Subject: Bell Canada Pension Plan

Dear Mr. Deslauriers,

Please find attached Ms. Tovee's letter of today's date.

Thank you



Jasmine Randhawa

Legal Assistant to David Rosenfeld and Brittany Tovee

T: +1 416-595-2138 | E: jrandhawa@kmlaw.ca

Koskie Minsky LLP, 20 Queen Street West, Suite 900, Toronto, ON. M5H 3R3


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*THIS IS EXHIBIT "G" REFERRED TO IN THE
AFFIDAVIT OF JASMINE RANDHAWA
SWORN BEFORE ME, THIS 25 DAY OF JULY, 2018*



A COMMISSIONER FOR TAKING AFFIDAVITS, ETC.


Brittany Tovee

Catalogue no. 62-553-X
ISBN 978-0-660-03817-9

The Canadian Consumer Price Index Reference Paper



Release date: December 18, 2015

 Statistics Canada Statistique Canada

Canada 

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The following symbols are used in Statistics Canada publications:

- not available for any reference period
- .. not available for a specific reference period
- ... not applicable
- 0 true zero or a value rounded to zero
- 0^s value rounded to 0 (zero) where there is a meaningful distinction between true zero and the value that was rounded
- P preliminary
- r revised
- x suppressed to meet the confidentiality requirements of the *Statistics Act*
- E use with caution
- F too unreliable to be published
- * significantly different from reference category ($p < 0.05$)

Published by authority of the Minister responsible for Statistics Canada

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An HTML version is also available.

Cette publication est aussi disponible en français.

Preface

This *Canadian Consumer Price Index (CPI) Reference Paper* provides an overview of the Canadian CPI. It is intended for a varied audience, ranging from users interested in general information to those requiring more technical or theoretical details. As such, it explains all the important aspects of the Canadian CPI: uses and interpretations, scope, classifications, sample strategy, price collection, index calculation, quality change, weights, basket updates, reliability and uncertainty, special cases and treatments and history.

The paper was written by Radu Chiru, Ning Huang, Mathieu Lequain, Phillip Smith and Amanda Wright of the Consumer Prices Division of Statistics Canada. Richard Evans provided key assistance in the preparation of this document. Appreciation also goes to Martin Beaulieu, Andrée Girard, Olfa Khazri, Michèle Lanoue, Gerry O'Donnell, Marc Prud'homme, Yannick Rancourt, Faouzi Tarkhani and Clément Yélou for their contributions and to the members of Statistics Canada's Price Measurement Advisory Committee for their comments.

This publication was prepared under the direction of:

Richard Evans	Director, Consumer Prices Division
Mathieu Lequain	Chief, Concepts and Methods, Consumer Prices Division
Ning Huang	Senior Economist-Analyst, Consumer Prices Division
Radu Chiru	Economist-Analyst, Consumer Prices Division
Amanda Wright	Economist-Analyst, Consumer Prices Division

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Reader's Guide

This volume explains the conceptual, structural and methodological basis of the Canadian Consumer Price Index (CPI). It should be regarded as the successor to the book *The Consumer Price Index Reference Paper*, published in 1995.¹ Much has happened since that earlier paper was released and fresh documentation is now required. Most recently, the statistical quality of the CPI has been greatly enhanced as the result of a multi-year project launched in 2010, aimed at improving the index.

The material in this reference paper is fairly technical and may not be of interest to all users of the CPI. For some purposes, the alternative document *Your Guide to the Consumer Price Index*² may be a more useful source of information. That paper provides a brief and straightforward explanation of: (i) the CPI itself and how it relates to Canadian consumers; (ii) how the relative importance of different goods and services is determined for purposes of the index; (iii) the means by which prices are collected, compiled and adjusted, when necessary, for changes in the quality of goods and services; (iv) the index reference period, which is currently 2002=100.0; (v) the mathematical formulas for calculating percentage changes; (vi) the ways in which the CPI is sometimes used to adjust or "index" payments of various kinds; and (vii) how the CPI can be used to compare dollar values over time.

The remainder of this Reference Paper provides a thorough explanation of the concepts and methodology underlying Canada's CPI. The first chapter provides an overview and summary of the entire document.

1. Statistics Canada (1995).
2. Statistics Canada (1996).

Chapter 1 Introduction to the Canadian Consumer Price Index

1.1 The Canadian Consumer Price Index (CPI) is an indicator of the change in consumer prices. It measures price change by comparing through time the cost of a fixed-basket of consumer goods and services. Since the basket contains products of unchanging or equivalent quantity and quality, the index reflects only "pure" price change.

Availability and Uses

- 1.2 The CPI is released every month, about three weeks after the price observation period. A variety of CPI time series statistics for different product classes and geographical areas are available without charge on the Statistics Canada Internet site by means of CANSIM, Statistics Canada's on-line database, and via analytical publications.³
- 1.3 The index is used for an assortment of different purposes by various users. One of its most important uses is by governments, businesses and individuals to adjust selected contractual or legislated payments in line with inflation.⁴ By linking a stream of future payments to the CPI, it is possible to ensure the purchasing power represented by those payments is unaffected by the average change in consumer prices that may occur.
- 1.4 For more than two decades the Bank of Canada has based its monetary policy approach on inflation targeting, aiming to hold the rate of inflation, as measured by the CPI, between one and three per cent. In addition, the federal and provincial finance ministries frame their fiscal policies in terms of the income and expenditure accounts which, in turn, are reliant for their calculation on the CPI, among other statistical data sources. The CPI is regularly and widely reported by the news media and is the standard measure of inflation used by most Canadians.
- 1.5 The CPI itself compares prices in the current month, t , to prices in the index reference period, where the index is set arbitrarily to 100. For many purposes it is also useful to calculate month-over-month changes or 12-month changes, comparing prices in the current month to those in the immediately previous month or the same month one year earlier. Contributions to percentage change are also useful because they provide the influence of changes in sub-aggregate indices to changes in aggregate indices. In Statistics Canada's CPI publications, all indices and percentage changes are rounded to one decimal place.
- 1.6 For more on the availability and uses of the Canadian CPI, and on the interpretation of percentage changes and contributions to change in the CPI and the effect of statistical rounding on the index, refer to Chapter 2.

Scope of the Index

- 1.7 The CPI does not purport to measure the average movement of prices for all products bought and sold in Canada. Rather, its scope is limited to the prices of goods and services purchased by households in Canada. Moreover, the purchases of most, but not all households are in scope. The few exceptions include soldiers on military bases, people living on First Nations reserves and institutionalized persons, such as prison inmates and persons in long-term care facilities. In addition, households living in the rural areas of the three northern territories, outside Yellowknife, Whitehorse and Iqaluit, are deemed out of scope due to the difficulty and cost of monitoring prices in those remote regions.
- 1.8 Many products are out of scope for the CPI. For example, the prices of raw materials and other intermediate products purchased by manufacturers as inputs to their production processes are not included. Nor are the prices paid by governments for office equipment, consulting services and other products. Likewise the prices paid by businesses in other countries for exported Canadian goods and services are excluded. The CPI is all about the prices paid by households for consumer goods and services.

3. The Statistics Canada Internet site is www.statcan.gc.ca. The main Consumer Price Index publication is The Consumer Price Index, Catalogue No. 62-001-X, Monthly.

4. Among the many such indexed payments are those from the Canada and Quebec Pension Plans, Old Age Security and the Guaranteed Income Supplement; real return federal and provincial bonds and a variety of private financial arrangements such as some spousal and child support allowances, negotiated wage agreements and longer-term rental contracts.

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- 1.9 Financial products such as equities and bonds are not included either, even though they might be purchased by consumers, since they are considered financial investments rather than consumer goods or services. Nevertheless the prices of the services that facilitate the purchase of such financial assets, such as banking and brokerage charges, are in scope. Illegal products, such as non-prescription narcotic drugs, and a few legal products such as gambling services are also excluded, because of the practical or conceptual difficulties they present.
- 1.10 The CPI aims to measure average transaction prices throughout the entire reference month. Prices reflected in the index are those actually paid by Canadians to purchase consumer goods and services, including the impact of any discounts or sales and excise taxes that may apply, such as the Goods and Services Tax. Accordingly when tax rules or rates change, the index is affected. The index does not include personal income taxes because these are not associated with the purchase of any particular product.
- 1.11 Chapter 3 provides a more thorough explanation of the CPI scope.

Classifications

- 1.12 The CPI covers a wide range of goods and services and a large geographical area. It does this by using classifications of products and geography. The product classification contains 695 product classes that together account for all products in scope for the CPI calculation. The geographical classification has 19 area strata representing the ten provinces, with four in Ontario, three in Quebec, two in British Columbia and one in each of the others, plus the Primary Census Agglomeration (PCAs) of Yellowknife, Whitehorse and Iqaluit. The CPI is built up from price indices for elementary aggregates, which are pairings of product and geography classes from these two classifications. For more information about the product and geography classifications and the associated elementary aggregates, see Chapter 4 and Appendix B.

Sample Strategy

- 1.13 Households engage in millions of transactions every month. Most of the prices involved in these transactions are in scope for the CPI. However, since it is not practical to observe the prices in all transactions, a statistical sampling approach is required. That approach involves a general sampling strategy for most prices combined with more specialized strategies for some specific product classes.
- 1.14 General sampling for the CPI occurs in three stages. In the first stage, a set of representative geographical collection areas is selected, first in terms of census sub-divisions (which are essentially municipalities) and then in terms of specific census tracts within the chosen sub-divisions (which are like neighbourhoods within municipalities). The sampling of census sub-divisions (CSDs) and tracts is done with population counts serving as weights.
- 1.15 The second stage is the selection of representative outlets from the CPI outlet frame. The degree of "representativeness" of outlets is assessed using a variable such as annual sales revenue. In the third stage a set of representative products (RPs) from each of the product classes is chosen to characterize all the products in that class and to be collected in the outlets selected at the second stage. The product sample is not probabilistic because there is no comprehensive sampling frame for all consumer transactions.
- 1.16 At the outlet sampling stage, the goal is to identify sales by product class by type of outlet (large retail stores, small retail stores, Internet sales, and so on), in order to identify which types of outlets account for the largest proportion of consumer purchases. That done, specific outlets can be selected in which to observe the prices of specific RPs. For a few product classes, where national or provincial pricing predominates, prices are collected via the Internet or through other means not involving direct collection in stores. However, in most instances prices are obtained locally in retail stores.

- 1.17 From each product class a small sample of RPs is chosen to characterize all the products in that class. Ideally the selection of RPs would be chosen probabilistically, with associated weights reflecting the relative importance of each product within the class. This would require a products “frame” – a comprehensive and up-to-date list of products with associated expenditure values – from which to select and weight the sample of collected prices. Frame information of this kind is available for a few selected product classes, but is presently unavailable for most product classes. For this reason, the selection of RPs for most product classes is done judgmentally, with emphasis on products that are known to be among the most popular with consumers.
- 1.18 For a few product classes, no sampling is required because it is possible to observe all transaction prices for the entire product class. This is substantially the case for passports, passenger vehicle permits and driver’s licenses. Cut-off sampling is used in some instances. The profiles method is used where the market normally prices product bundles instead of individual products and the bestsellers method is used for products where prices are based on the intangible characteristics, such as novelty of the content.
- 1.19 The sample size is limited by budgetary considerations. Given a particular sample size, the optimal allocation of sample across product/outlet pairs is a challenge. Key factors entering into decisions about this allocation are the volatility of the product price, the basket weight for the product class in question and the associated collection cost. The more volatile a product’s price, the greater its basket weight and the lower the marginal cost of price quote collection, the larger will be the price sample for that product category.
- 1.20 Chapter 5 provides more details on the sampling strategy for the CPI.

Price Collection

- 1.21 Most of the price quotes used to calculate the CPI are collected in the sampled outlets in various locations across the country. The collection is done by employees, known as interviewers, supervised by the Statistics Canada Regional Offices. Each month Statistics Canada headquarters sends a sample request to the interviewers, who collect the requested price quotes, record them in Computer-Assisted Personal Interview (CAPI) devices and transmit the data to headquarters in Ottawa for further processing.
- 1.22 Back at headquarters the observed prices are reviewed for conformity with the sample request, checked for unusual or ‘outlier’ values and corrected if necessary, adjusted for quality changes where appropriate (as explained in Chapter 7) and generally made ready for the CPI calculation.
- 1.23 For more about the price sample collection and processing procedures, see Chapters 5 and 7.

Calculation of the Consumer Price Index

- 1.24 The calculation of the CPI is done in two steps. The first, termed the lower level calculation, involves calculating price relatives, using a matched-model approach, and then averaging them together to obtain elementary price indices. The second step, referred to as the upper level calculation, involves the estimation of aggregate price indices as weighted averages of the elementary price indices.
- 1.25 The lower level calculations are mostly done using an implicitly weighted geometric mean equation, referred to as the Jevons formula. There are some exceptional cases, however, where alternative formulas are used. Some of the more significant among these special cases are the elementary product classes for mortgage interest charges (explained in Chapter 10), dwelling rents, property and automobile insurance, banking services and post-secondary education services (see Chapter 6 and Appendix B).
- 1.26 The upper level calculations are done using a fixed-basket Lowe formula, which applies fixed quantity weights to the elementary price indices in order to aggregate them. The basket weights determine the relative importance of different product classes and geographical regions in the All-items CPI.

- 1.27 The structure and methodology of the CPI are technically complex and the summary just given omits many details. A fuller description is provided in Chapter 6. In addition, the mathematical formulas for the aggregation of the CPI are listed in Appendix A.

Quality Change and Adjustment

- 1.28 The CPI aims to measure 'pure' price change and it does this via the 'matched-model' approach to sampling. However, what happens when a given sampled product is no longer carried by a particular outlet, or when the outlet in which the product's price is collected has closed its doors? In this kind of situation a substitute product or a replacement outlet must be chosen and price change in the affected month must be adjusted for any quality difference that may exist between the new and the old products.
- 1.29 Adjustments for quality change are often fraught with difficulty and pose a demanding challenge for index compilers. A variety of different methods are employed depending on the circumstances.
- 1.30 For some products there is no significant possibility of quality change and for these, no adjustments are needed. Examples include products like electricity, natural gas, motor gasoline and refined sugar and flour. For some packaged products, the quality is unlikely to change significantly but the quantity in the container may increase or decrease. When this happens, the observed price change is adjusted to standardize for quantity. Examples of this standardization treatment include cereals, laundry detergents and candy bars. The more difficult cases of quality adjustment involve such products as automobiles, high-tech goods, items of clothing and many types of services. These products involve more substantial changes in the inherent quality of the product over time as a result of technological innovation, changes in fashion or other factors.
- 1.31 A thorough discussion of how quality change is dealt with in the CPI is provided in Chapter 7. As explained there, a variety of methods are used for the various product classes. Among these are implicit techniques, such as direct price comparison, overlap pricing, overall mean imputation, and link-to-show-no-change. Where implicit adjustment is not feasible, various explicit quality adjustment methods, including hedonic modeling, the option cost method or expert judgment are used. The table in Appendix B includes a column showing the quality adjustment method used for each published product class.

Weights and Basket Updates

- 1.32 The product and geographical classifications, discussed in Chapter 4, are important to many aspects of the CPI. They offer users of the index considerable detail that is helpful in analyzing inflationary trends. They provide a foundation for the price sampling strategy, as discussed in Chapter 5. In addition, they are central to the "fixed basket" concept that underlies the CPI upper level calculation.
- 1.33 To grasp the fixed basket concept consider the following story. A person enters a store, fills a shopping basket with various products and pays for these items at the cash register. The following month the person goes back to that store and buys the exact same quantities of the same goods and services. In other words, the person buys a "fixed basket" of goods and services. The cost of the products bought in the second month divided by the cost of the identical items purchased in the first month is an aggregate price relative. Defining a price index starting value of 100 in the first month, the price index will change in the second month to 100 multiplied by the aggregate price relative just computed. This is what is meant by a fixed basket concept. The CPI is essentially a fixed basket index of this type, except that the CPI "basket" contains not just a few specific products, but rather all the in-scope goods and services purchased by households in Canada.
- 1.34 Each of the elementary classes has a fixed quantity weight that is used as part of the CPI aggregation process – that is, to combine the elementary price indices into the All-items CPI. However, data on consumer expenditures is much easier to obtain than data on quantities purchased. Since the Lowe formula can be expressed in terms of quantities, expenditures or expenditure shares, the aggregate expenditures for each elementary class are used. These expenditures are a product of the unobserved quantities and the observed prices. In order to maintain the fixed quantity nature of the index, the expenditures used in the calculation have to be price-updated according to observed price changes.

- 1.35 The CPI expenditure weights are estimated primarily from data taken from Statistics Canada's Survey of Household Spending (SHS), which is conducted annually and yields statistical estimates of household expenditure by product class and region, about eleven months after the reference year. Of course, household expenditure patterns are in constant flux in response to demographic change, the economic cycle, shifting relative prices and other factors. The current practice is to measure the household expenditure weights comprehensively for a 12-month period, and to refresh these estimates every two years. When the weights are recalculated in this way, the process is referred to as a "basket update".
- 1.36 The CPI is a sequence of fixed basket indices, each with its own unique classification structures and basket weights, which have been chain linked together. At present the basket updates occur every two years or so, but in the past they were carried out less frequently. Appendix C provides a detailed chronology of the various baskets implemented since the CPI began in 1913. The 100-year time series for the CPI, which is available on CANSIM, is really a chain-linked series of many CPIs.
- 1.37 It is important to distinguish between the weight reference period, the index reference period and the price reference period. The first of these is the period from which the CPI expenditure weights are taken. The index reference period is the period in which the index is arbitrarily scaled to equal 100. Currently, for the Canadian CPI this is 2002. The choice of index reference period has no effect on percentage changes in the index. Users can easily change the index reference period by simply rescaling the index accordingly. Statistics Canada also maintains a few alternative CPI series on CANSIM with different index reference periods, for the convenience of users. Finally, the price reference period is the period that prices are being compared with. It appears in the denominator of price ratios and is typically designated as period 0.
- 1.38 Chapter 4 provides a more thorough discussion of the CPI classification systems, while Chapter 8 focuses on the weights and basket updates as well as the index base period.

Reliability and Uncertainty

- 1.39 Statistical error is, of course, the difference between the unknown "true" value and the measured value. The CPI is a sample-based statistic and like all such statistics, is subject to several types of error. The error can occur either during the lower level calculations or as part of the upper level calculations.
- 1.40 Statistical bias arises when the expected average result over many samples differs from the "true" value. In the case of the CPI, bias can occur for several reasons. When statisticians need to replace one product with another and they make an associated quality adjustment, statistical bias might be introduced if the method for doing so had a persistent tendency either to underestimate or to overestimate the true extent of quality change. Bias might also be inherent in some editing procedures, although of course Statistics Canada strives to avoid any such bias.
- 1.41 Sources of potential bias are associated with new product introductions and outlet substitutions. New product introduction bias occurs when innovative products appear on the market and are not reflected in the CPI product sample in a timely manner. A number of steps are taken to guard against this bias, but it is difficult to avoid entirely, especially given the CPI's matched-model pricing methodology. Outlet substitution bias occurs when new stores enter the market offering lower prices and thereby inducing consumers to switch outlets. Again this is a difficult source of potential bias to avoid completely, but efforts are made to refresh the outlet sample periodically to minimize this kind of bias.
- 1.42 Sampling variance is an error characteristic that is very different from statistical bias. It refers to the extent of dispersion of estimates, over many samples, around the "true" value. In a statistical context, larger samples will yield lower variance. Efficient statistical estimation means minimal variance given the sample size. It is quite possible to have a zero bias and a positive variance. However, the only way to achieve a zero sampling variance is to measure the entire target population which, in the case of the CPI, is not possible.

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- 1.43** Most Statistics Canada surveys report numerical estimates of the size of the sampling variance. These provide users of the statistics with an indication of statistical reliability. Thus, when a particular statistical estimate is released, the variance might be used to calculate what the “true” value is expected to be within certain specific numerical boundaries 19 times out of 20. As explained in Chapter 5, however, this is not possible for the CPI because, since product sampling is almost always done judgmentally rather than randomly, sampling variances cannot be calculated.
- 1.44** The CPI may also be subject to non-sampling errors of various kinds. Clerical and transcription errors fall into this category, although there are a number of checks and balances in the CPI monthly production process that aim to detect and correct any such errors. Another source of non-sampling error is errors and omissions in the business frame (list) that is used in selecting the sample of outlets for price collection. Again, efforts are made to minimize such errors, but it is nearly impossible to keep the list of retail businesses constantly up to date and without error.
- 1.45** Another notable source of potential error in the CPI applies to the elementary aggregates that are estimated by imputation rather than by direct price measurement. There are several residual classes in the CPI product classification, typically containing a wide variety of distinct goods and services, yet having comparatively small basket weights. Price change for these elementary aggregates is estimated indirectly, by imputation, as a cost saving measure. The expense of direct price measurement in these cases would be unjustified given their small basket weights and heterogeneous character.
- 1.46** Prices change with the passage of time and as they do, consumers tend to substitute goods and services that have become relatively cheaper for ones that have become relatively more expensive. For example, if pork prices have risen less rapidly than beef prices, there is an incentive for consumers to buy more pork and less beef. This phenomenon tends to make the basket weights out of date as time goes by. It causes a problem called substitution bias that influences the CPI upper level calculation.
- 1.47** Ideally the basket weights would reflect purchasing patterns of consumers in both periods for which prices are being compared. In other words, if the index is comparing two particular months, the weights would reflect the purchasing patterns of consumers in those two months. This is not presently feasible. In fact, the weights come not from the two months where prices are compared, but from some period (typically a year) prior to the price reference period (0) and price observation period (t). This is the main source of substitution bias in the CPI. Normally the closer is the time period from which the weights are calculated to the two months being compared, the smaller will be this source of bias. When, in 2013, Statistics Canada increased the frequency with which the basket weights are updated from once every four years to once every two years, this reduced substitution bias.
- 1.48** In addition, the upper level calculations are affected by statistical error in the SHS, which is used to estimate the basket weights.
- 1.49** Chapter 9 gives a much fuller discussion of the CPI’s reliability, error properties and statistical bias.

Treatment of Owned Accommodation

- 1.50 Owned accommodation is an important component of the CPI, with a large basket weight, which poses especially difficult conceptual and methodological issues. There is no international consensus on how best to define and measure the price of owned accommodation and countries have adopted a variety of approaches. This makes international comparisons of inflation challenging.
- 1.51 The difficulty in this case stems from the fact that owned accommodation can, for some purposes, be thought of as a capital good rather than consumption good. Like all capital goods, it provides a stream of services over a lengthy period of time. Statistics Canada's approach is to measure the impact of price changes on the costs incurred by homeowners while they own a home. These costs include mortgage interest, replacement cost (depreciation), property taxes, home and mortgage insurance, maintenance and repairs, and other expenses. The first three of these cost categories account for three quarters of the total owned accommodation basket weight.
- 1.52 The owned accommodation price index is explained in Chapter 10.

Seasonal Products

- 1.53 Some of the products whose prices are measured by the CPI are highly seasonal, both in terms of the quantities purchased each month by consumers and in terms of the prices retailers charge at different times during the year. This is true for fresh fruit and vegetables, some kinds of clothing and certain recreational services, for example.
- 1.54 The basket weights applicable to seasonal products are, just as for non-seasonal products, estimated using annual household expenditure statistics. They are, therefore, not seasonal even though the monthly purchases by consumers can vary considerably through the year. Indeed, for some products in some months consumer purchases are zero – Christmas trees in July, for example. Statistics Canada deals with such cases by imputing the price movement based on that of similar in-season products. The fact that actual purchases of seasonal products in a given month can be very different from the purchases that are reflected in the yearly basket weights is another source of statistical bias in the CPI. This bias is likely to average near zero for the year as a whole, but can be significant in month-over-month comparisons. Bias is discussed in Chapter 9.
- 1.55 A related matter is the fact that monthly changes can be substantially influenced by seasonal factors. For any given month-over-month percentage change, users of the index often find it advantageous to distinguish between the part that is attributable to normal seasonal causes and the remaining non-seasonal part. The seasonal part is predictable and, therefore, less interesting. The non-seasonal part reflects the underlying trend in prices as well as any special temporary factors, and is more noteworthy.
- 1.56 Seasonally adjusted indices reflect price change after seasonal fluctuations are removed. Statistics Canada provides seasonally adjusted versions for the All-items CPI, the eight major aggregates and four of the special aggregates. These indices are adjusted independently, which implies they are not consistent in aggregation, and these indices are also subject to revision over time, unlike the unadjusted indices which are not revised.
- 1.57 The influence of seasonality on the CPI is discussed in Chapter 10.

History of the Canadian Consumer Price Index

- 1.58 Canada's CPI has a century-long history. Not surprisingly, the index has been improved greatly over that lengthy period. The interval between basket changes was reduced in several steps, from 13 years the first time the basket was updated in 1926 to just 2 years currently. The estimates of the basket weights were much enhanced by the introduction of the Family Expenditure Survey for the year 1938. The scope of the index has been broadened several times, in a number of ways. The sample size has risen, fallen and risen again, reflecting changing budgetary priorities. In addition, while the index was often revised during its first few decades, starting with the postwar period, the policy has been to eschew statistical revisions of the unadjusted statistics, as a convenience to users.
- 1.59 For more on the history of Canada's CPI, see Chapter 11 and Appendix C.

Chapter 2 Availability and Uses

Availability of Information

- 2.1 The All-items Consumer Price Index (CPI), various aggregate indices as well as special aggregate indices are produced and published each month for Canada, the provinces, Whitehorse and Yellowknife. Additionally, the All-items CPI and the Shelter price index are produced and published for sixteen cities.⁵ The All-items CPI is the only index published for Iqaluit.
- 2.2 The monthly CPI series for the eight major aggregates at the Canada level are also available seasonally adjusted. Each year with the release of the December CPI in January, annual average indices are produced for all of the published monthly indices. Annual average indices are calculated as the unweighted arithmetic average of the 12 monthly indices within the year. The monthly and annual average indices for the All-items CPI for Canada are available in chain-linked series back to 1914. Indices for other geographies and/or aggregates are available starting from various periods as they entered the CPI statistical program.
- 2.3 In addition to the monthly and annual CPI series, average retail prices (not price indices) for food and other selected items for Canada and average retail gasoline and fuel oil prices for eighteen cities⁶ are estimated and published monthly.
- 2.4 Inter-city indices of price differentials of consumer goods and services are produced and published once a year for eleven cities.⁷
- 2.5 All monthly CPI statistics are available at 8:30 am EST on the day of the release. The release is typically on the third Friday of the month following the price observation period. For example, the CPI for price observation period January 2014 was released on February 21st 2014.
- 2.6 At present, there are three main vehicles for the release of the CPI data:
- 2.6.1 The Canadian Socio-Economic Information Management System (CANSIM)⁸
 - 2.6.2 *The Daily*⁹
 - 2.6.3 The Consumer Price Index publication¹⁰
- 2.7 CANSIM is Statistics Canada's key socioeconomic database in which users can easily access a large range of statistics free of charge. CANSIM contains many more CPI series than either *The Daily* or the CPI publication.
- 2.8 *The Daily* is Statistics Canada's main release bulletin and the Agency's first line of communication with the media and the public. *The Daily* provides an overview of the monthly CPI statistics while focusing on the indices which had the most notable upward or downward contributions to the year-over-year (12-month) and monthly percentage changes in the CPI.
- 2.9 The CPI publication includes the same text and graphs contained in *The Daily* as well as a lengthy list of statistical tables and information on the quality, concepts and methodology of the CPI.
- 2.10 Once published, the official CPI statistics are not revised. Seasonally adjusted price indices are the only CPI series which are revised. Those data are revised one month after release and then each year with the January CPI, the past 36 months of seasonally adjusted data are revised.

5. The sixteen cities are: St. John's, Charlottetown-Summerside, Halifax, Saint John, Québec, Montréal, Ottawa, Toronto, Thunder Bay, Winnipeg, Regina, Saskatoon, Edmonton, Calgary, Vancouver and Victoria.

6. The eighteen cities include the previous sixteen cities plus Whitehorse and Yellowknife.

7. The eleven cities are: St. John's, Charlottetown-Summerside, Halifax, Saint John, Montréal, Ottawa, Toronto, Winnipeg, Regina, Edmonton and Vancouver.

8. Statistics Canada, CANSIM Tables 326-0009, 326-0012, 326-0015, 326-0020 and 326-0021.

9. Statistics Canada, *The Daily*, Catalogue No. 11-001E.

10. Statistics Canada, *The Consumer Price Index*, Catalogue No. 62-001-XWE, Monthly.

Interpreting Percentage Changes

- 2.11 The CPI is a composite price index, which compares prices for consumer products in various price observation periods (which can be months or years), to prices in the index base period (also referred to as the index reference period). The CPI is arbitrarily set to equal 100 in the index base period. Therefore, all index values express price change in percentage terms in comparison to the index base period. For example, if the index is 123.4, that means prices have increased 23.4% since the base period. The current index base period of the CPI is 2002.
- 2.12 The CPI base period can easily be changed by multiplying all CPI series by a constant conversion factor equal to 100, divided by the average index for another specific time period. This is known as rebasing an index. Period to period price change will not be impacted by rebasing an index.¹¹
- 2.13 Other common time comparisons that are made with the CPI include:
- 2.13.1 month-over-month percentage changes which compare price indices in a given month to price indices in the preceding month (e.g. November compared to October).
 - 2.13.2 year-over-year (12-month) percentage changes, which compare price indices in a given month to price indices in the same month of the preceding year (e.g. November 2012 compared to November 2011).
 - 2.13.3 annual average percentage changes, which compare two consecutive annual average price indices.
- 2.14 Special aggregate indices are calculated and published monthly and on an annual basis for Canada, the provinces, Whitehorse and Yellowknife.
- 2.15 Special aggregates are different combinations of the elementary aggregate indices. They often exclude certain product classes, in order to provide users with supplementary information on how consumer prices are changing. These indices provide alternative measures of consumer price inflation.
- 2.16 When a special aggregate index excludes certain product classes, their corresponding weights are removed from the total. As a result, the shares of the remaining goods and services increase in relative importance.

Contributions to Price Change

- 2.17 A fixed-basket composite price index for a given aggregate I_A^{Or} is made up of price indices I_i^{Or} and weights w_i^0 for the sub-aggregates that are contained in the given aggregate.¹² Therefore it is possible to explain a given aggregate's price change (month-over-month or 12-month) in terms of the influence exerted by its particular sub-aggregates. Analyses of this kind are referred to as contributions to percentage change. Contributions explain how many percentage points of the aggregate percentage change come from a given sub-aggregate. For example, the gasoline index (a sub-aggregate) contributed 0.5 percentage points to the 1.0 percent change in the All-items CPI.
- 2.18 The influence exerted by a given sub-aggregate on a composite price change depends on both its price change and on its importance in the basket, as measured by its weight. Calculating contributions to composite price change across chained baskets requires additional steps.¹³

11. However published percent changes may differ due to rounding.

12. The computation of fixed-basket composite price indices is discussed in paragraphs 6.25-6.36.

13. This is because chained indices are computed using several fixed-baskets; hence there can be no single expression of the importance (weight) of each sub-aggregate. The method for calculating contributions to index percentage change across baskets is discussed in paragraphs 8.22 to 8.24.

2.19 Any composite price index that relates to one fixed basket can be written as a weighted arithmetic average of the corresponding indices for all its constituent sub-aggregates. In other words, the aggregate index $I_A^{0:t}$ that expresses the change in prices between period 0 and t is a weighted mean of all the indices $I_i^{0:t}$ expressing the change in prices during the same period for all its constituting sub-aggregates.

$$I_A^{0:t} = \sum_{i=1}^n I_i^{0:t} \times w_i^{0b} \quad (2.1)$$

Where:

$$w_i^{0b} \equiv \frac{p_i^0 q_i^b}{\sum_{i=1}^n p_i^0 q_i^b} \text{ is the hybrid expenditure share,}^{14}$$

p_i^0 is the price for sub-aggregate i in period 0;

q_i^b is the quantity for sub-aggregate i in period b , and;

n is the number of sub-aggregates in the aggregate A.

2.20 Using (2.1), it is possible to decompose the monthly price change of the aggregate index between $t-1$ and t $\left(\frac{I_A^{0:t}}{I_A^{0:t-1}} - 1\right)$ in terms of the monthly change of its sub-aggregates.¹⁵ By construction, the weighted sum of all the sub-aggregates' monthly price changes will be equal to the monthly price change of the aggregate.

$$\left(\frac{I_A^{0:t}}{I_A^{0:t-1}} - 1\right) = \frac{I_A^{0:t} - I_A^{0:t-1}}{I_A^{0:t-1}} = \frac{\sum_{i=1}^n (I_i^{0:t} - I_i^{0:t-1}) w_i^0}{I_A^{0:t-1}} \quad (2.2)$$

Where:

$$\frac{(I_i^{0:t} - I_i^{0:t-1}) w_i^0}{I_A^{0:t-1}} \text{ represents the contribution of each sub-aggregate } i \text{ to the aggregate A.}$$

2.21 The share of the basket weight w_i^{0b} of the sub-aggregate index i , together with the size and direction of its price change will determine the size and direction of its contribution to the percentage change in the aggregate index A. An increase/decrease in a sub-aggregate index will most often translate into an upward/downward contribution to the aggregate index percentage change.¹⁶ The sum of the contributions of all sub-aggregates of the All-items CPI is equal to its overall rate of change (monthly or 12-month).

14. Hybrid expenditure shares are discussed in paragraphs 6.27 to 6.31.

15. The same exercise can be carried out when analysing the 12-month percent change.

16. The direction of a sub-aggregate's contribution to aggregate index percentage change may be different than the percent change of the sub-aggregate when the period of comparison spans two baskets. The method for calculating contributions to index percentage change across baskets is discussed in paragraphs 8.22 to 8.24.

- 2.22** The difference in contributions gives the impact of a sub-aggregate on the difference in the percentage change of its aggregate index. This is commonly referred to as acceleration or deceleration and is obtained by subtracting the contribution in period $t-1$ from the contribution in period t . For example, assuming that the gasoline index contributed 0.5 percentage points in period $t-1$ to the 1.0 percent change in the All-items CPI and in period t contributed 0.7 percentage points to the 1.4 percent change in the All-items CPI, it can be interpreted that the gasoline index contributed 0.2 percentage points ($0.7 - 0.5$) to the 0.4 percentage point acceleration ($1.4 - 1.0$) of the All-items CPI between periods $t-1$ and t .
- 2.23** The analysis provided by Statistics Canada in the various release items for the CPI is based on an understanding of the contributions of sub-aggregate indices to the monthly or 12-month percentage change in the All-items CPI or another aggregate index.

Rounding in the Consumer Price Index

- 2.24** During the different steps of their construction all CPI indices are calculated to several decimal places. However, consistent with international practice, indices are rounded to one decimal place when they are published. Percentage changes (monthly, 12-month and annual average) in Statistics Canada publications are always calculated with the published rounded indices. They are also rounded to one decimal place. That way, users can always replicate the published percentage changes.
- 2.25** As a result of these two stages of rounding, a small amount of accuracy in percentage changes may be lost. Therefore, small fluctuations (± 0.1) in the percentage changes of indices should be interpreted with discretion.
- 2.26** Another side effect of rounding indices is that at times there could appear to be inconsistencies between the percentage changes in aggregate indices and their sub-aggregate indices. For example, the rounded percentage change of an aggregate index may not be centered among the rounded percentage changes of its sub-aggregate indices.
- 2.27** The loss of precision due to rounding is amplified when indices are of small value. Therefore, rebasing an index, which generally results in smaller index values for the past, can reduce the precision of calculated percentage changes. For example, with an index base period of 1914=100, a 0.1 percent increase in the All-items CPI from 1914 to 1915 would translate to an index value of 100.100, rounded to 100.1. However, with an index base period of 2002=100, the rebased 1914 index value would be 6.0. The same 0.1 percent increase in the All-items CPI from 1914 to 1915 translates to an index value of 6.006, rounded to 6.0. Therefore, rounding indices reduces the precision for percentage changes for periods in the past. Loss of precision in historical figures should be considered when deciding to rebase an index.

Uses of the Consumer Price Index

- 2.28** The CPI, as a composite price index, is an official measure of consumer price change through time. It is of interest to governments, unions, business organizations, research institutions and very large segments of the general public. Undoubtedly, the CPI is one of the most widely-known, quoted and used statistical series in Canada. Its prominent profile, while indicative of wide acceptance, also poses problems because the CPI cannot serve all uses perfectly and equally well. Users are advised, therefore, to approach the CPI with discretion, especially when using it for purposes that lie outside of its main focus.

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- 2.29** The CPI is often used to adjust incomes, wages or other payments to maintain previous purchasing power in the face of changing consumer prices. In some cases, periodic changes to specific payments are made using a built-in adjustment factor, in which the CPI rate of change is applied either wholly or in part. This is currently the case, for example, for government payments resulting from such social programs as the Canada and Quebec Pension Plans, Old Age Security and the Guaranteed Income Supplement. Some labour-management contracts also contain cost-of-living adjustment clauses, by which wages and salaries are tied to the CPI in a variety of ways. Even more frequently, the CPI serves as a point of reference in wage and salary negotiations without being applied as a built-in adjustment factor. Many other financial arrangements make reference to the CPI in adjusting the terms of payment.¹⁷ Finally, it is likely that many Canadians monitor the CPI to judge how their incomes (or expenditures) are keeping pace with consumer price change.
- 2.30** As an adjustment factor, whether it is used automatically or as a point of reference, the CPI has come to affect most Canadians, and it plays an extremely important role in the economic and social affairs of the country. The CPI, for example, is a good indicator of changes in the purchasing power of the consumer dollar. However, the index does not dictate what the specific adjustments should be to wages and other forms of income. It is up to the contracting parties to determine the proportion of changes in purchasing power that should be compensated for. The following should be considered by those who use the CPI as an income adjustment factor.
- 2.30.1** The CPI is an indicator that relates, by definition, to a specified target population, may not reflect the experience of a particular group within this population. However, it is unlikely that the differences between the average change in consumer price indices for the target population and those for any other broad segment of the Canadian population would be large over the long run.¹⁸
- 2.30.2** The CPI, by construction, is not a Cost-of-living-Index (COLI) and while it may serve as a close approximation for one, it does not take into account some aspects or concepts which would typically be included in a COLI.¹⁹ For example, it does not include the effect of changes in the external environment, such as incidence of disease and natural disaster or crime levels, which may affect the demand for certain goods and services with little or no effect on prices. Additionally, as an asymmetrically weighted, fixed-basket index the CPI does not, in a timely manner, account for consumer substitutions among purchased products.²⁰
- 2.31** The CPI is often used as a general indicator of inflation in Canada. An analysis of the CPI, in conjunction with analyses of other statistical series, can reveal fundamental trends in the economy. The CPI therefore plays an important role in the formulation of policies and in economic forecasting. The comparison of current changes in the CPI to changes in the past, and to the behavior of similar indices in other countries, helps analysts to evaluate the effectiveness of many economic policy decisions. Although the CPI is often used as a general indicator of inflation, it is worth underlining some important limitations in this respect.
- 2.31.1** The CPI is not a comprehensive measure of price change at the final stage of economic transactions. This is because the index does not take into account some elements of the final use of goods and services in the country, such as the consumption of government services, capital formation or exports.
- 2.31.2** The mortgage interest cost index in the owned accommodation component of the CPI reflects not only current price changes, but also past changes by means of a moving weighted average of price changes over multi-year periods.²¹

17. A partial list includes: rental agreements, insurance coverage, private loans, spousal maintenance, child support allowances and Consumer Price Index-indexed bonds.

18. Taktek (1998) Chiru (2005).

19. For more information on the concepts of a Cost-of-living-index (COLI), see National Research Council (2002).

20. Substitution bias in the Consumer Price Index is discussed in paragraph 9.22.

21. Further explanation of the mortgage interest cost index can be found in paragraphs 10.13- 10.23.

- 2.32** The Implicit Price Index for domestic final expenditures in the Canadian System of National Accounts (CSNA), being free of the above limitations in addition to being calculated with a symmetrically weighted index formula, is a more comprehensive indicator of overall inflation. It is, however, released quarterly, two months after a given quarter, relates to non-market as well as market segments of the economy and relies on imputed prices for some important components, notably owner-occupied housing. It is also subject to revisions over several years as more statistical information becomes available.²²
- 2.33** The importance of the CPI as a general indicator of inflation has become more apparent since February 1991, when the Bank of Canada switched to an inflation targeting regime with the All-items CPI as its target indicator. While the CPI has always been a key statistical measure used by the Bank of Canada in determining its monetary policy, the adoption of an inflation targeting regime increased the attention given to the CPI as a general indicator of inflation.

22. For further information on the Chain Price Index used in the Canadian System of National Accounts, see Statistics Canada (2008).

Chapter 3 Scope of the Index

- 3.1 The scope of the Consumer Price Index (CPI) is defined to indicate what the CPI is intended to measure. Since there are many uses of the CPI, its scope has been defined to suit as many purposes as possible. However, the diverse uses of the CPI mean that it may not suit any one purpose perfectly and therefore awareness about the scope is necessary when using the CPI for a particular function.
- 3.2 The CPI indicates the average price change of a fixed basket of consumer products purchased by Canadian private households. Therefore, the scope consists of transactions, for the purpose of consumption, between households in Canada and establishments operating in Canada. Only those transactions for purposes of consumption are included in the CPI. Therefore, investment expenditures, that is, transactions made with the intention of acquiring some sort of future purchasing power for example, the purchase of stocks or bonds, are excluded from the CPI. The inclusion or exclusion of particular transactions will be discussed in more detail later in this chapter.
- 3.3 The scope of the CPI can be mapped to several dimensions, namely: Population coverage, geographical coverage, product coverage, prices and time. The scope is reflected in the product and geographical classifications for which basket weights, derived primarily from the Survey of Household Spending (SHS)²³, are assigned. The intention and ideal scenario is that each good or service in scope for the CPI be represented by observed transaction prices. However, operational constraints as well as the complexity of measuring the vast and continuously changing universe of consumer transactions make this impossible to achieve in practice. As for most statistical surveys, the CPI is based on a sample of collected prices.
- 3.4 Defining the scope of the CPI is both a conceptual and a practical exercise. The fundamental question regarding scope is: Does measuring the prices for a particular good or service fit the uses of the CPI? While there are many products for which prices could be collected, they may not necessarily suit the purposes of the index and therefore could be excluded from the scope. There are also some products which may be determined to be in scope for the CPI but for which it is too difficult to estimate consumer expenditures and/or price change. For these goods or services it is generally better to define them as out of scope than to include them without adequate measurement options.²⁴ The following sections of this chapter will discuss the conceptual and practical questions surrounding the scope of the CPI.

Population Coverage

- 3.5 The CPI target population is the group of people whose consumption expenditures are in the scope of the index. For the CPI, the target population consists of families and individuals living in urban and rural private households in Canada.²⁵
- 3.6 The definition of private households in the CPI is consistent with that used in the Canadian Census of Population.²⁶ Consumption expenditures made by people living in institutions or collective households (e.g. prisons or long term health care facilities), as well as members of the Canadian Forces living in military camps, are excluded from the CPI scope. Expenditures made by people living on First Nations reserves are also excluded from the CPI. The decision to exclude these expenditures is primarily based on the operational difficulty of collecting data applicable to these households.
- 3.7 The aim of the CPI is to measure domestic consumer price change, meaning that only transactions between the target population (private households in Canada) and establishments (businesses or governments) operating in Canada are in scope. Therefore, transactions made outside of the country (e.g., restaurant meals bought while on vacation in Brazil) or transactions made with online establishments that do not physically operate within the borders of Canada are not in scope for the CPI. However, online establishments that do have physical operations in the country (e.g. a shipping warehouse) are included in the CPI.

23. For information see the Statistics Canada Survey 3508.

24. Examples include gambling and life insurance.

25. All physical boundaries of Canada are not in scope for the Consumer Price Index. See sections 3.10-3.11 for more information on geographical coverage.

26. Statistics Canada, *Families Reference Guide, 2011 Census*, Catalogue No. 98-321-XWE201105.

- 3.8** In practice, the CPI does not strictly follow a 'domestic' approach because the weights used to compile the CPI basket, which are derived primarily from the SHS, follow the 'national' concept. This means they may include household expenditures made outside of the country. Additionally, the SHS does not include spending by foreigners while visiting Canada. While these expenditures are included in final domestic demand, it is not desirable to include them in the CPI given that the index's primary uses include determining domestic monetary policy and adjusting payments of wages of Canadian residents and businesses.
- 3.9** Having basket weights that follow a 'national' approach has a minimal impact on the CPI given that the proportion of consumer expenditures made outside of Canada relative to the expenditures made in the country is small. If data were available on the proportion of the consumer expenditures, by product, that were made out of the country, Statistics Canada could make efforts to remove this spending from the CPI basket. Alternatively, if the expenditure data were available efforts could be made to estimate the price change for the out-of-country transactions. However, the lack of data and the operational challenges in trying to estimate out-of-country price change make these options impractical. Moreover, including price change of out-of-country transactions is not suitable for the use of the index in guiding Canadian monetary policy.

Geographical Coverage

- 3.10** The CPI covers price change experienced by private households in the ten provinces as well as Yellowknife, Whitehorse and Iqaluit. Price change in all other areas of Yukon, the Northwest Territories and Nunavut are excluded from the scope of the CPI. While it would be desirable to include transactions made by private households in all areas within each Territory, from an operational perspective it is not practical to collect prices outside of Yellowknife, Whitehorse and Iqaluit. The decision to exclude areas outside of the main urban centres in Yukon, the Northwest Territories and Nunavut is based on the assumption that price change in the cities does not acceptably reflect price change in the remaining regions of the Territories. Therefore, the decision was made to limit the scope of the CPI to the three northern capital cities.
- 3.11** All areas within the ten provinces and the three northern capital cities are in scope for the CPI, meaning that movements in the indices represent price changes for the entire province or city specified. However, because of operational constraints having to do with price collection, generally prices are only collected in more heavily populated areas within each province. The rationale for only collecting prices in more populated areas is based on the fact that total consumer expenditures are greater in areas with more residents, so the basket weights for the less populated areas would be quite small. Additionally, there is an assumption that price changes in less populated areas generally follow similar trends to price changes in populated areas. In this context it is important to keep in mind that the CPI aims to measure price change not price levels.

Product Coverage

- 3.12** The CPI measures price change for consumer products, which are goods and services that are purchased for the purpose of consumption. For the most part, products included in the CPI must be associated with a transaction price, that is, with an amount of money that a consumer must pay to purchase a specific quantity and quality of a good or service.²⁷

27. Some areas of consumption, notably those within owned accommodation, do not have specific transaction prices associated with them and therefore must be imputed. These are included in the Consumer Price Index (CPI) despite the absence of specific transactions because they represent a significant proportion of consumer spending. The treatment of owned accommodation in the CPI is discussed in more detail in Chapter 10.

- 3.13** Strictly speaking, long-lived assets are excluded from the CPI. This is because they are not purchased primarily for consumption in the near future. However, distinguishing between expenditures on products for consumption and expenditures on assets for investment purposes can be quite complex for many consumer product categories, the most challenging of which is housing. Housing is seen as an asset, a durable good which provides positive economic value over an extended period of time, so house prices are not directly included in the CPI. However, a house is also consumed gradually over time by the person living in it. This is why house prices enter indirectly into the measurement of the CPI component for owned accommodation. Separating the asset portion of the house from the consumption part of the house is not simple either in concept or in practice and this is why the treatment of owned accommodation is one of the most debatable issues surrounding the construction of CPIs around the world.²⁸
- 3.14** In addition to housing, there are various other product categories in which it is difficult to distinguish between consumption and investment. For this reason, a selective approach is employed in the CPI. For instance, in the category of insurance, premiums for homeowners' and tenants' property insurance as well as vehicle insurance are included in the CPI scope because their premiums are related to specific goods and services (the contract normally guarantees the replacement or restoration of specified goods). In contrast, life and disability insurance are excluded because the payments stipulated in the insurance contract may be interpreted as representing future purchasing power, which cannot be identified with the consumption of any specific good or service.
- 3.15** While investments are excluded from the scope of the CPI, additional costs associated with making an investment transaction such as commissions or fees paid to stock brokers are included in the CPI. These fees are associated with a service provided by a financial institution and are consumed by the purchaser.
- 3.16** Transfers are transactions where no specific goods or services are received in exchange for payments made. Income taxes are an example. Because transfers are not associated with the acquisition or consumption of specific products they are out of scope for the CPI.²⁹ Most goods and services financed through the public taxation system (e.g. public education, public health care) are considered transfers even though they are paid for through taxation, because a private household does not receive any specific good or service in exchange for the amount of taxes paid. Most public services are therefore excluded from the CPI.
- 3.17** However, not all goods or services that are publically provided are transfers. For instance some public goods and services have a direct user fee or cost of consumption associated with them, such as a passport, public transit, or health care charges for private hospital rooms or ambulance fees, and these are included in the CPI. Additionally, transactions made between private households and government-owned utilities or corporations, such as municipal water rates or postal services, are included in the CPI. While property taxes are classified as a transfer for many purposes, they are considered an integral part of the cost of owning and using a dwelling and thus are included in the calculation of the owned accommodation component of the CPI.³⁰ Other forms of transfers, including gifts, donations to charities, tips and gratuities are excluded from the CPI.³¹
- 3.18** From a conceptual standpoint, second hand or used goods are in scope for the CPI as long as there is a transaction between a private household and an establishment operating in Canada. However, in practice the prices for these products are usually not collected as part of the CPI sample because the associated consumption expenditures generally account for a very small proportion of overall consumer spending.
- 3.19** Interest that may be levied due to purchases made on credit, such as credit card or bank loan interest charges, is not included in the CPI. The issue of interest charges is very complex, raising both conceptual and practical challenges for which there is no consensus and no clear recommendation.³² The CPI does include interest paid on a mortgage, as it is deemed an integral part of consuming an owner-occupied dwelling.³³

28. The treatment of owned accommodation in the Consumer Price Index is discussed in more detail in Chapter 10.

29. International Labour Office (ILO) *et al.* (2004), paragraph 3.41.

30. The treatment of owned accommodation in the Consumer Price Index is discussed in more detail in Chapter 10.

31. ILO *et al.* (2004), paragraphs 3.45-3.46.

32. ILO *et al.* (2004), paragraphs 3.67-3.71.

33. The treatment of owned accommodation in the Consumer Price Index is discussed in more detail in Chapter 10.

- 3.20 Some but not all transactions involving the purchase of illegal or socially undesirable goods and services are in scope for a CPI.³⁴ The CPI takes a selective approach when deciding whether to include them or not. For example, tobacco products are included while illegal narcotics are deemed to be out of scope. Practical considerations in effectively measuring the prices involved in some of these transactions are a key factor.

Prices used in the Consumer Price Index

- 3.21 The prices included in the CPI are final prices, inclusive of all excise and other taxes paid by consumers. In particular, they include the Goods and Services Tax (GST), provincial retail sales taxes or Harmonized Sales Taxes (HST), as well as any environmental, liquor and tobacco taxes wherever applicable. It follows that the CPI could change as a result of changes in any of these types of taxes. In contrast, the CPI does not include changes in personal income taxes because as discussed above, these are transfers and are thus out of scope for the CPI.
- 3.22 Since the CPI includes only those transactions between private households in Canada and establishments operating in Canada, no foreign prices are included in the CPI. The prices of imported goods nevertheless have an important impact on the CPI because many of the products sold by resident establishments are either imported or have significant import content. As a result, changes in the exchange rate of the Canadian dollar against other currencies do have an impact on the CPI since they affect prices for imported goods which are then sold to domestic consumers.
- 3.23 Discounted prices are included in the CPI as long as they relate specifically to the product in question. That means the sale price cannot be tied to the purchase of another product (e.g. a consumer obtains a discount on a printer with the purchase of a computer). When discounts are offered in kind (e.g. free winter tires with the purchase of a new car) the purchase price is reduced by the monetary value of the product offered in kind.
- 3.24 The aim of the CPI is to measure the changes in prices paid by consumers and those prices sometimes differ from the associated sticker or list prices. However, data on transaction prices are not always observable for consumer products. Therefore, Statistics Canada collects Product Offers (POs) as proxies for transaction prices. For the CPI a PO is the presentation of a particular good or service, with an associated price, by a retailer to a purchaser. The POs used in the calculation of the CPI are determined by the sample.

Time Represented in the Consumer Price Index

- 3.25 The smallest unit of time represented in the CPI is one month. That is, the CPI represents price change from one month to another. While in practice, prices are observed at specific moments in time within a particular month, the published indices do not represent price change occurring at any time interval less than one month. Rather, the index measures the change in average prices in one month compared to average prices in another month.
- 3.26 There are three approaches which can guide decisions about when to collect and incorporate a given set of observed prices in the CPI. These approaches relate to the period in time when goods and services are paid for, acquired (that is, legally owned) or consumed (that is, used). The three need not coincide and would produce different CPIs. The 'payments approach' is taken when the prices relate to the period in which the expenditures for the product are made. The "acquisitions approach" involves observing prices at the time at which the good or service is obtained by the consumer (that is, when the legal ownership of the product passes to the consumer). The 'use approach' entails observing prices at the time when a product is consumed. These times of payment, acquisition and use might extend over more than one month. For many goods and services the difference between these three approaches is not significant, because the times when consumers pay, acquire and use goods and services are typically synchronized. However, for some products, particularly durable goods or large expenditure items, the timing of price observation can yield different results.

34. ILO *et al.* (2004), paragraphs 3.123-3.124.

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- 3.27** For the majority of products, the CPI aims to follow the acquisitions approach, meaning that the observed prices relate to the transaction cost in the time period in which the legal ownership of the good passes to the consumer. The main reason for following the acquisitions approach is that it is consistent with an accrual accounting system³⁵ which is used in the Income and Expenditure Accounts in the Canadian System of National Accounts (CSNA).
- 3.28** There are also practical reasons for choosing the acquisitions approach. One, the data and information that would be required to measure the flow of service arising from the gradual consumption of various products generally makes the use approach an impractical one. Similarly, because many goods and services are purchased on credit, with multiple purchases frequently being amassed on one form of loan (e.g. a credit card whose balance is carried for many months), the consistent application of the payments approach across the CPI is not practical. Therefore, given the benefit of consistency with the accounting principles of the CSNA and Statistics Canada's practice of capturing price information from retailers' posted prices (POs), the acquisitions approach is the most suitable choice for the CPI.
- 3.29** There are special cases, either for conceptual or practical reasons, that the CPI may not strictly follow the acquisitions approach. A few examples include air fares, travel tours and traveller accommodation. While the observed prices relate to the period in which the consumer obtained ownership of the ticket, travel package or hotel reservation, the prices are applied to the index in the period in which the service is used. For example, if a consumer purchases a travel package in January for a holiday in March, the price is recorded in January (the time when the consumer obtained ownership of the service); however it will not enter the CPI calculation until March (the time when the service is used). In these cases, it is practical to apply a use approach because the exact period when the service is consumed is known with certainty.

35. An accrual accounting system reflects revenue and expenses in the period in which they are deemed to have been earned and incurred, whether or not they relate to cash receipts and disbursements in the same period. See Statistics Canada (2008).

Chapter 4 Classifications

- 4.1 The product and geographical classifications for the Consumer Price Index (CPI) are designed to meet three important criteria: 1) the classification reflects economic reality faced by consumers; 2) the classification meets the needs of index users, and 3) the classification is unambiguously mutually exclusive and exhaustive.³⁶
- 4.2 The product classification is a hierarchy of 695 elementary product classes up to the All-items CPI.³⁷ There are several intermediate aggregation stages that are relevant for different levels of analysis, including the eight major aggregates ("Food", "Shelter", "Household operations and furnishings", "Clothing and footwear", "Transportation", "Health and personal care", "Recreation, education and reading", and "Alcoholic beverages and tobacco products").
- 4.3 The geographical classification is a hierarchy of 19 geographical strata which aggregate to Canada. Most provinces and the three northern capital cities are represented by one stratum each. However, Quebec, Ontario and British Columbia are divided into three, four and two strata respectively. The allocation of strata within these provinces is based on Economic Regions defined by the Canadian Census of Population.³⁸ While indices are computed for each geographical stratum, indices are only published for Canada, the provinces, Yellowknife, Whitehorse and Iqaluit.
- 4.4 The intersections of the product and geographical classifications constitute the elementary aggregates of the CPI. Elementary aggregates are the lowest-level classes to which a set of fixed-quantity basket weights is assigned. For this reason, indices for elementary aggregates are the primary building blocks to construct all indices at higher aggregation levels. Additionally, they constitute the smallest elements by which it is possible to analyze and explain price movements at aggregate levels. Finally, elementary aggregates also serve as strata for price sampling with the purpose of enhancing the reliability and relevance of the indices that are derived from samples of collected prices.
- 4.5 Beyond these basic rules, the designation of elementary aggregates is a matter of compromises and balances between different, often contradictory, requirements. For example, creating many very detailed elementary aggregates could be advantageous as a guide for sampling. Narrowly defined groupings of goods and services and geographies are more likely to be homogeneous from the viewpoint of price changes, which would in turn enhance sampling efficiency. On the other hand, when elementary aggregates are looked at as building blocks of the CPI it becomes essential that the indices exhibit reasonable statistical reliability. This would be difficult to achieve for numerous detailed product and geography groupings without very large price samples.
- 4.6 With all of this in mind, in addition to the requirement of supporting the analysis of consumer price change by various users, effort is made to designate elementary aggregates as groupings of products and geographies that:
- 4.6.1 Have clear and economically meaningful content.
 - 4.6.2 Make possible the production of consumer price indices of acceptable statistical quality, given the available resources.
 - 4.6.3 Have a reasonable degree of homogeneity in the product and geographical dimensions.
- 4.7 The imperative characteristic of a classification, that it must be exhaustive (covering all goods and services and geographies within the scope of the CPI) as well as mutually exclusive (no product or geographical stratum can belong to more than one elementary aggregate), gives rise to the possibility of $695 \times 19 = 13,205$ elementary aggregates from the CPI classification. However, the number is smaller in practice due to lesser product detail in some geographical strata.

36. ILO *et al.* (2004), paragraph 3.14.

37. This is the number of elementary product classes based on the 2013 basket. See Statistics Canada Survey 2301.

38. The Consumer Price Index strata for Quebec, Ontario and British Columbia are based on Economic Regions (ERs) from the 2006 Canadian Census of Population.

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- 4.8 Elementary aggregates are the basis of the fixed-basket concept of the CPI. Indices for elementary aggregates (lower level) are the starting points of the CPI aggregation using the Lowe fixed-basket formula (upper level).³⁹
- 4.9 The Canadian CPI also makes use of basic classes, a chosen point in the classification in which the quantity weights are unchanged for the duration of the basket. This means that the quantities for elementary aggregates below the basic class level may be adjusted during the lifespan of a basket as long as the quantities at the basic class level are unchanged.⁴⁰
- 4.10 In many cases, basic classes are equal to elementary aggregates. For the CPI, basic classes are also the lowest level at which indices are published.
- 4.11 In an effort to further support the analysis of consumer price changes, many special aggregates are also produced. Special aggregates such as, "Goods", "Services", "All-items excluding Food and Energy", and "The Bank of Canada's Core Index",⁴¹ are constructed by aggregating different groups of elementary aggregate indices. These special aggregates are analytically helpful and are useful in understanding the contributions of certain elementary aggregates to overall price change.

39. The calculation of indices at the lower and upper levels is discussed in Chapter 6.

40. The Consumer Price Index basket weights and the process for updating them are discussed in Chapter 8.

41. The Bank of Canada's core index excludes eight of the Consumer Price Index's (CPI) most volatile components (fruit, fruit preparations and nuts; vegetables and vegetable preparations; mortgage interest cost; natural gas; fuel oil and other fuels; gasoline; inter-city transportation; and tobacco products and smokers' supplies) as well as the effects of changes in indirect taxes on the remaining components. For more information on the Core CPI please see the Bank of Canada's website www.bankofcanada.ca.

Chapter 5 Sample Strategy and Price Collection

- 5.1 The number and variety of transactions that consumers engage in is immense. It would be neither practical nor affordable to collect prices for all transactions of products sold in all outlets⁴² to compile the Consumer Price Index (CPI). Therefore a sample strategy is necessary.
- 5.2 The CPI has always had a policy of adopting the most appropriate measurement methodologies for each of its elementary indices. This has led to sometimes very divergent sampling practices in different parts of the CPI. This chapter will cover the range of sampling practices currently used in the CPI, first focusing on the general sampling approach which covers more than 50% of the CPI by basket weight.⁴³ The chapter will then discuss some of the more specific sampling approaches in other parts of the basket, including full universe price coverage, cut-off sampling and price modelling.
- 5.3 Not all elementary price indices are estimated with observed prices. For some elementary aggregates, particularly the "catch-all" classes with heterogeneous product mixes that typically represent more marginal consumer expenditures, price collection is not practical or necessary. In these cases, imputations are made whereby the price movement of the elementary aggregate is estimated via proxy, using the price movement of a donor class.

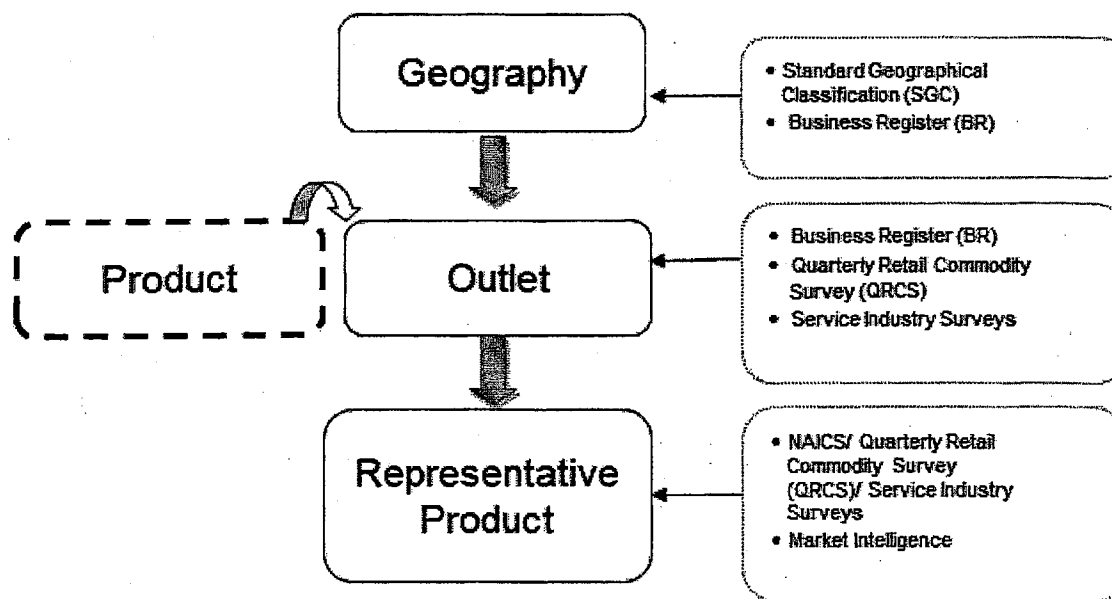
General Sampling Approach

- 5.4 The general sampling approach for the CPI can be seen as a three-stage survey design. The first stage covers geography, the second is for outlets and the third stage is for the products. Even though the product component appears at the last stage, types of products have a major influence during the second stage when outlets are selected. Figure 5.1 depicts this general approach for selecting sampling units, starting from geography, then using the product type information for outlet selection and then assigning Representative Products (RPs) to be observed within each outlet. More details on each of these stages are provided in the following paragraphs.

42. The term "outlet" refers not just to stores in the normal sense of that word, but also Internet sellers, vending machines, door-to-door vendors, catalogue mail order merchants, telephone salespeople and vendors using other means to connect with customers. Nevertheless, the vast majority of Consumer Price Index price quotes are collected in traditional retail stores.

43. This proportion of the products in the Consumer Price Index which are covered by the general sampling strategy is estimated using the 2013 basket weights. Statistics Canada, Survey 2301.

Figure 5.1
Stages of Sampling Strategy in the Consumer Price Index



- 5.5** The geographical sampling unit is primarily the Census Sub-Division (CSD) as defined by Statistics Canada's Standard Geographical Classification (SGC). CSDs are similar to municipalities and are chosen for the CPI sample based on information such as population counts and economic activity.⁴⁴ The CSDs are selected as the sampling unit mainly because they are stable over time and because every location in the Business Register (BR),⁴⁵ the frame for outlet selection, is mapped to CSDs.
- 5.6** To facilitate outlet sampling and price collection management, CPI collection areas have been defined. For small to medium size CSDs, collection areas correspond to the CSD. In cases where the CSD is too large to represent one collection area it is broken down into smaller areas which are amalgamations of Census Tracts (CTs), which can be seen as equivalent to neighbourhoods. The number of collection areas within a CSD depends on the number and variety of retail and services locations as well as the size, in terms of square kilometres, of the CSD.⁴⁶
- 5.7** The CPI survey frame is used to select the outlets where price collection is to take place. The frame was built using existing Statistics Canada sources, mainly the BR, the quarterly Retail Commodity Survey (RCS)⁴⁷ and services industry surveys such as the monthly Food Services and Drinking Places Survey. The RCS and services industry surveys are used to link the CPI product classification to the industry classification in the BR, which is the North American Industrial Classification System (NAICS).⁴⁸
- 5.8** A major feature of the CPI survey frame is that it gives the revenue, according to the BR, of each outlet by RCS commodity class or service industry using the data reported in various Statistics Canada surveys. This characteristic of the frame helps in dealing with big retailers such as the department stores, which typically sell a range of products. It facilitates the selection of outlets which are among the most popular in each product class or service industry.

44. Beaulieu (2012).

45. The Business Register is a listing of all business units that operate in Canada. It is compiled and used by Statistics Canada for use in conducting business surveys.

46. More details are available in Beaulieu (2012).

47. Statistics Canada Survey 2008.

48. Beaulieu (2012).

- 5.9 The outlet sampling process for the CPI is done in two phases. The first phase, pre-contact sampling, is designed to validate the information from the BR, such as activity status, industrial classification and contact information. Depending on the industrial classification, additional questions may be asked to determine whether specific products are sold. This phase is done quarterly, by telephone. The second phase, field sampling, consists of selecting a subset of outlets from the pre-contact output (after all out-of-scope and refusal units are removed) to be sent for field collection by specialized Statistics Canada employees, known as price interviewers. Remaining in-scope outlets that were not selected for the field sample are kept as a replacement list.
- 5.10 After outlets are selected, a set of RPs is assigned to be observed in each outlet. Subject matter experts use external databases and market research to help define RPs in a way that strikes a balance between specificity and flexibility. Price interviewers then select specific products that meet the RP definitions. This approach ensures the interviewers have a clear understanding about what kind of product to select (keeping intact the matched-model approach of the CPI) while at the same time providing leeway to choose products that are locally popular (upholding the representativeness of the estimated elementary indices).
- 5.11 The RP list may be different from one outlet to another according to the information obtained from the CPI survey frame and the pre-contact phase. For example, one pharmacy may be designated to have health care goods as well as some food items (such as milk and bread) collected, if those products correspond to its main streams of revenue. However, this may not be the case for all pharmacies in the CPI sample.
- 5.12 The number of RPs assigned to each elementary aggregate depends on the weight and the complexity of measuring price change for the given product class. In a complex elementary aggregate, one which may have a lot of heterogeneous products included, several RPs will likely be assigned. In a more simple elementary aggregate, just one or two RPs might be enough to measure price change adequately.
- 5.13 An RP assigned to an outlet is called a Target Product Offer (TPO). The TPO acts as the sample intention. The sampling allocation scheme allots a number of TPOs to each elementary aggregate, taking into account the basket weight, price variability and cost of collection for each elementary aggregate. The objective is to allocate the available sample optimally in order to estimate elementary indices of the best possible quality.⁴⁹
- 5.14 Every month the price interviewers observe Product Offers (POs) for TPOs. The monthly process begins with a detailed sample request from headquarters to the interviewers. Most of this request is the same as in the previous month, since the CPI follows the matched-model approach. The sample request is loaded into Computer-Assisted Personal Interview (CAPI) devices. Carrying these devices, the interviewers visit each of the outlets in their particular workload. In each outlet, the interviewer finds the required POs and enters their prices and characteristics into the devices.
- 5.15 When a PO is advertised as being "on special" interviewers record this in the CAPI device. If the item cannot be found because the shelf is empty, the interviewer consults with a store manager and determines whether it is temporarily out of stock or is no longer carried by the outlet. Either way, this information is recorded in the device and transmitted back to Statistics Canada headquarters.
- 5.16 If the PO being sought is determined to be no longer carried, a substitute PO is selected and this information is recorded in the CAPI device. For especially complex POs such as high-tech goods and items of clothing, the interviewers also fill out forms providing additional details about the characteristics of the substitute PO. This additional information assists the analysts at headquarters who assess the extent of quality change and estimate an appropriate adjustment.⁵⁰
- 5.17 When an interviewer must select a substitute PO, as just described, he or she is guided by the RP description, a set of detailed product specifications loaded in the CAPI devices. The interviewer is asked to select a substitute PO that fits the description.

49. Beaulieu (2012).

50. Quality adjustment techniques used in the Consumer Price Index are discussed in Chapter 7.

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- 5.18** For many RPs it is not necessary to observe POs every month, either because their prices tend to change less frequently or because they are only available in specific times of the year. For one example, tuition fees typically change only once a year, in a predictable month, so they are collected only in that month. For another, Internet access service fees are collected every second month because their prices change infrequently. In fact, every RP description specifies the month(s) of collection.
- 5.19** If a price change is known to take place outside an RP's default pricing schedule Statistics Canada will conduct a special pricing.⁵¹ This ensures that elementary indices represent, as much as possible, price change in a timely manner.⁵²
- 5.20** As for the timing of collection within the month, most POs are observed in the first two weeks, with the first week being defined as the one containing at least three business days from the calendar month. Gasoline prices are an exception due to their typical intra-month volatility and thus are collected in four weeks.
- 5.21** When the POs have been collected they are sent to Statistics Canada headquarters by encrypted digital transmission, where they are compared against the original sample request to determine the sample's completeness and conformity to requirements. Thereafter, the POs undergo further review and processing. Any unusual price movements are carefully checked to ascertain their validity. Corrections are made if necessary. Where POs have been substituted, the degree of quality difference is assessed and an appropriate quality adjustment is made if necessary. Steps are also taken to ensure the POs include applicable taxes. Finally, with all checks and adjustments completed, the elementary price indices are calculated.

Specific Sampling Approaches

- 5.22** Exceptions are made to the general sampling approach. These exceptions are intended to capture price change for elementary aggregates where information on the universe of consumer transactions is available or where the attributes of the products within the elementary aggregate are complex and require different techniques.
- 5.23** Elementary aggregates where full information on the universe of consumer transactions is available include those goods or services that have only one market and/or seller. Examples include passport fees and drivers' licenses. For these there is no sample drawn because all prices are collected and used in the CPI.
- 5.24** For some elementary aggregates in which there is one seller in a particular geographical stratum,⁵³ a sample of outlets and products is not required. However, in these cases the first stage of the general sampling approach, in which collection areas are selected, is still necessary. Usually, the collection of these POs is done by employees at Statistics Canada headquarters rather than by interviewers in the field.
- 5.25** The prices used to calculate the rent price index come from the Labour Force Survey, which uses a probabilistic sample.⁵⁴
- 5.26** Some elementary aggregates in the CPI follow cut-off sampling.⁵⁵ When there is information available on the outlet and/or product universe the goal is to maximize the coverage of both. Most times information on market composition comes from third party administrative databases, often available via the Internet. These databases are used to rank outlets and/or products so the sample covers a majority of the market. Once TPOs are assigned via cut-off sampling, POs are collected at Statistics Canada headquarters.

51. Examples where special pricing occurs include tax changes or other advertised/scheduled price changes, such as increases to government regulated service fees.

52. The default pricing frequency for each basic class in the Consumer Price Index is listed in Appendix B.

53. Examples of product classes where there is one seller in a particular geographical stratum include some public utilities such as water or electricity companies.

54. Statistics Canada, Survey 3701.

55. Examples of elementary aggregates that use cut-off sampling are the purchase of passenger vehicles, and various telecommunication indices such as telephone services, Internet access services and cablevision and satellite services.

- 5.27 There are some elementary aggregates where the target population purchases bundles of services rather than individual products⁵⁶ or where prices are based on a set of specific conditions.⁵⁷ The CPI uses the profiles method to capture price change for these products.
- 5.28 Representative bundles or consumer profiles are selected using available market information. The intention is to cover a majority of the services and outlets that are available in a particular market. In these cases POs for the defined consumer profiles are observed at Statistics Canada headquarters from large industry databases.
- 5.29 The profiles method is another application of the matched-model framework. By observing POs of identical consumer profiles every month, this method ensures that the quantity and quality of bundled services are constant over time and that the CPI reflects pure price change. As with the entire CPI sample, it is important that consumer profiles are reviewed and updated regularly to ensure that representative consumption bundles are being priced. When profiles must be changed because the component products are determined to be new or of different quality, then quality adjustment techniques should be applied.
- 5.30 Some elementary aggregates are characterized by products whose prices are determined not by their physical characteristics, but by their intellectual content and novelty. For these elementary aggregates the CPI uses the bestsellers method to estimate price change.⁵⁸ In these cases POs are observed in the field by price interviewers as well as on the Internet.
- 5.31 There are two elementary aggregates which use modelling to estimate price change: the Mortgage interest cost and the Homeowners' replacement cost indices, two components of the owner-occupied accommodation price index. Unlike the treatment of other durable goods in the CPI, owner-occupied housing follows a user-cost approach, which aims to measure the implicit price of the flow of services coming from a fixed stock of owned dwellings. This price index requires special measurement methods. Using collected data from the Survey of Household Spending,⁵⁹ along with other data inputs on house prices and interest rates, price change is estimated.⁶⁰

56. Examples of elementary aggregates that follow the profiles method are products that are typically purchased in package form, such as banking fees, Internet service fees, cable and satellite television fees and telephone services.

57. The best example of such a product is insurance, as home or car insurance premiums are based on the characteristics of the home or driver being insured as well as the desired coverage characteristics.

58. An example of an elementary aggregate that uses the bestsellers method is Books and other printed matter (excluding textbooks). The price index is based on the estimated total cost of the top 10 bestsellers in sampled bookstores in each period.

59. Statistics Canada, Survey 3508.

60. The treatment of owner-occupied accommodation in the Consumer Price Index along with the specific model calculations for the Mortgage interest cost and Homeowner's replacement cost indices are discussed in Chapter 10.

Chapter 6 Calculation of the Consumer Price Index

- 6.1 The Consumer Price Index (CPI) is calculated in two stages, termed the lower level and the upper level.
- 6.2 At the lower level of calculation, price change is estimated for elementary aggregates. These are found at the lowest level in the product and geographical classifications of the CPI and are most often calculated using a Jevons (geometric mean) index number formula. Elementary aggregates consist of similar groups of products in a geographical stratum.⁶¹
- 6.3 At the upper level, an asymmetrically-weighted fixed-basket Lowe price index formula (Laspeyres-type) is used to combine elementary aggregates in order to obtain upper level aggregate indexes.
- 6.4 This chapter will discuss the two-stage calculation of the CPI, first explaining the computation of elementary indices at the lower level. While the chapter will focus on the standard method for computing indices, some non-standard methods used in the CPI will also be discussed. Then the chapter will explain the method used to aggregate elementary price indices to the upper level.

Calculation of Elementary Indices (lower level)

- 6.5 At the lower level, elementary price indices are calculated for 695 elementary product classes in each of the 19 geographical strata of the CPI.⁶² Elementary indices can be understood as the building blocks of the CPI and represent the lowest level of the fixed-basket index hierarchy. Estimation of price change at this level is usually done via the standard approach for elementary price index calculation. Exceptions are made for special cases addressed later in this chapter.⁶³
- 6.6 Not all elementary indices are derived directly from observed prices. At the Canada level, 76% of elementary indices, by basket weight, are derived directly from observed prices within their product class and geography. Table 6.1 shows that the proportion of elementary indices estimated with direct price observation varies across geography. The remaining portion of elementary indices is imputed, either from another closely related product class, or from the same product class in another geographic stratum.⁶⁴

61. Classifications of the Consumer Price Index are discussed in Chapter 4.

62. There are slightly fewer elementary aggregates (that is, "Building blocks") to the Consumer Price Index than the maximum of 695 X 19 because not all of the 19 geographic strata have the full 695 product classes. The absence of product classes occurs mainly in the small geographic strata. Each elementary aggregate has a corresponding expenditure weight used in the upper-level calculation. This number of elementary aggregates is based on the 2013 basket. Statistics Canada, Survey 2301.

63. Some common index formulae used to calculate elementary price indices can be found in Appendix A.

64. Of these elementary aggregates estimated by proxy, roughly half, by basket weight, are product imputations (e.g. price movements for college tuition fees are imputed from the price movement of university tuition fees within each geographic stratum) and the other half are geographic imputations (e.g. price movements for baseball game admission fees in Prince Edward Island are imputed from those in Toronto).

Table 6.1
Proportion of elementary aggregates, estimated with direct price observation

Geography	Proportion (%)
Canada	75.8
Newfoundland and Labrador	87.8
Prince Edward Island	87.8
Nova Scotia	87.8
New Brunswick	86.7
Quebec	79.0
Ontario	75.2
Manitoba	86.9
Saskatchewan	87.4
Alberta	86.0
British Columbia	76.2
Yellowknife	80.5
Whitehorse	81.7
Iqaluit	67.8

Note: The proportion of elementary indices is based on 2013 basket weights.

Source: Statistics Canada, Consumer Prices Division. Survey No. 2301.

- 6.7** Most of the elementary aggregates that are not calculated using observed prices are catch-all product classes; as such, they represent more marginal and diverse varieties of products which do not fit neatly into any of the other elementary product classes. Typically these catch-all product classes would also be significantly more expensive to estimate via direct price observation. Their price change is usually estimated by imputing the price movement from another elementary price index for which prices are observed.
- 6.8** While it would appear ideal that all elementary price indices be calculated using observed prices within their product class, this is not always necessary. Since the goal of the CPI is to measure price change, and not absolute price levels, sampling strategies are developed to reflect which product offers (POs) are the most important to capture directly, and which others may be suitably estimated via imputation.⁶⁵
- 6.9** The CPI follows the matched-model approach for calculating elementary price indices whereby identical (unchanging quantity and quality) POs are followed through time. However, it is not always possible to follow the same products across time, as new goods and services are constantly emerging and old ones disappearing. When an identical PO cannot be collected in a subsequent period, a replacement PO must be observed. This chapter will not discuss situations where POs are replaced.⁶⁶
- 6.10** Examples where the calculation of elementary price indices is a relatively simple matter are the few elementary aggregates for which there is one product having a single price. These product classes typically have goods or services for which prices are determined by a level of government, such as drivers' licenses or passport fees. In such cases, the ratio of one month's price over the previous month is the best estimate of price change. However, for the majority of elementary product classes reality is more complex, mainly because of the availability of many competing and continuously changing product types.
- 6.11** In the majority of cases, elementary price indices are based on a sample of prices for one or more goods or services belonging to the elementary product class. The sampled POs receive equal weighting in this elementary calculation, because consumer expenditure weighting information is usually not available at this level.

65. The sampling strategy for the Consumer Price Index is discussed in Chapter 5.

66. The ways in which adjustments are made for the quality changes that may occur when product offers (PO) are replaced are discussed in Chapter 7.

6.12 The following section describes the standard approach for calculating elementary price indices. The chapter will then go on to discuss several of the elementary price indices for which estimation methods differ from the standard approach either because of the complex nature of estimating price change for the goods and services within the elementary product class or because additional information is available that can be used to produce an improved elementary price index.⁶⁷

The Standard Approach for Calculating Elementary Price Indices

6.13 The standard approach refers to the most commonly used method of combining prices, in order to estimate price change for elementary aggregates in the CPI. Typically consumer expenditure patterns below the elementary aggregate level are not known and therefore the implicitly weighted geometric mean, known as the Jevons formula (6.1), is used to calculate an average price relative from the sample of the collected POs. This means the price relative of each collected PO is assigned equal importance in the calculation. The Jevons formula has been used by Statistics Canada since 1995 as its primary formula for the calculation of elementary price indices in the CPI.

$$I_{J,a}^{t-1:t} = \prod_{i=1}^n \left(\frac{p_i^t}{p_i^{t-1}} \right)^{1/n} \quad (6.1)$$

Where:

$I_{J,a}^{t-1:t}$ is the implicitly weighted Jevons price index for elementary aggregate a between period $t-1$ and period t ;

n is the number of POs i in elementary aggregate a ; and

$\frac{p_i^t}{p_i^{t-1}}$ is the price relative for PO i between period $t-1$ and period t .

6.14 The Jevons formula (6.1) can also be calculated by taking the ratio of the implicitly weighted geometric mean prices of the observed POs in the two periods being compared (6.2).

$$I_{J,a}^{t-1:t} = \frac{\prod_{i=1}^n (p_i^t)^{1/n}}{\prod_{i=1}^n (p_i^{t-1})^{1/n}} \quad (6.2)$$

Where:

$\prod_{i=1}^n (p_i^t)^{1/n}$ is the geometric mean price for all POs i for elementary aggregate a in period t , and

$\prod_{i=1}^n (p_i^{t-1})^{1/n}$ is the geometric mean price for all POs i for elementary aggregate a in period $t-1$.

67. A listing of all of the basic classes in the Consumer Price Index including their methods of estimation is in Appendix B.

6.15 The Jevons formula was adopted because it has advantages over the previously used Dutot formula.⁶⁸ Firstly, the geometric mean of price relatives (Jevons) is less influenced by extreme prices than is the ratio of arithmetic mean prices (Dutot). The resulting elementary price indices are less volatile.⁶⁹ Secondly, elementary price indices that are calculated as geometric means of price relatives (Jevons) can be interpreted in two ways; first, as an average of price changes (6.1) and second as a change in average prices (6.2). The first interpretation, which is only applicable to the Jevons formula, is convenient for explaining the composition of aggregate price changes.

Other Methods for Calculating Elementary Price Indices

6.16 Among the 695 elementary product indices there are several departures from the standard approach.⁷⁰ Exceptions to the standard approach are usually made because more complete information is available on the universe of transactions within the elementary aggregate.

6.17 Post-1995, arithmetic formulas were retained for the calculation of a few elementary price indices (Rent, Passenger vehicle insurance premiums and Tuition fees). What sets these elementary aggregates apart is that the sampled POs are drawn from a population frame and there is confidence that the sample sufficiently represents the universe of consumer expenditures for these product classes. Furthermore, the contractual nature of the expenditures in these product classes means that it is likely that product substitution will not take place over the period of price comparison. The unweighted arithmetic formula used in the Canadian CPI is the Dutot (6.3).⁷¹

$$I_{D,a}^{t-1:t} = \frac{\sum_{i=1}^n \frac{1}{n} p_i^t}{\sum_{i=1}^n \frac{1}{n} p_i^{t-1}}$$

(6.3)

Where:

$I_{D,a}^{t-1:t}$ is the Dutot price index for elementary aggregate a between period $t-1$ and period t ;

n is the number of POs i in elementary aggregate a ;

$\sum_{i=1}^n \frac{1}{n} p_i^t$ is the arithmetic mean price for all POs i for elementary aggregate a in period t ; and

$\sum_{i=1}^n \frac{1}{n} p_i^{t-1}$ is the arithmetic mean price for all POs i for elementary aggregate a in period $t-1$.

68. The Dutot formula was used as the standard method for calculating elementary price indices in the Consumer Price Index prior to 1995.

69. The geometric mean of price relatives (Jevons) can be more volatile than the ratio of arithmetic mean prices (Dutot). This occurs in the case of very steep price drops as with liquidation sales. Liquidation sale prices, although they are part of the universe of consumer expenditures which the Consumer Price Index (CPI) aims to measure, are excluded from the CPI sample. This is because liquidation sales are deemed less representative of the average consumer transaction.

70. A listing of all of the basic classes in the Consumer Price Index including their method of estimation is in Appendix B.

71. The use of the Dutot formula is appropriate when product offers are expressed in a homogenous unit of measure. ILO *et al.* (2004), paragraphs 20.64-20.68. When quantity or expenditure information is available, an explicitly weighted Laspeyres-type formula (6.5) can be used, with the same weights appearing in the numerator and the denominator.

6.18 An explicitly weighted Jevons formula (6.4) is used in few special cases where more detailed expenditure information is available below the elementary aggregate level. Examples where an explicitly weighted Jevons formula is used are the indices for Postal fees, Newspapers and magazines, Urban transit and Parking rates.

$$I_{WJ,a}^{t-1,t} = \frac{\prod_{i=1}^n (p_i^t)^{w_i / \sum_{i=1}^n w_i}}{\prod_{i=1}^n (p_i^{t-1})^{w_i / \sum_{i=1}^n w_i}} \quad (6.4)$$

Where:

$I_{WJ,a}^{t-1,t}$ is the explicitly weighted Jevons price index for elementary aggregate a between period $t-1$ and period t ; n is the number of collected POs i in elementary aggregate a ;

$\prod_{i=1}^n (p_i^t)^{w_i / \sum_{i=1}^n w_i}$ is the explicitly weighted geometric mean price for all POs i in elementary aggregate a in period t ;

$\prod_{i=1}^n (p_i^{t-1})^{w_i / \sum_{i=1}^n w_i}$ is the explicitly weighted geometric mean price for all POs i for elementary aggregate a in period $t-1$; and

$$w_i / \sum_{i=1}^n w_i$$

is the weight of PO i as a proportion of the aggregate weight for all POs.

6.19 The weights used in the calculation do not have to relate to the period of price comparison, however in each comparison period they are fixed. The weights are obtained from administrative records or other data sources. These cases can be seen as improvements on the standard approach because rather than giving implicit equal importance to each price relative (6.1) they make use of additional information about the relative importance, or size, of each group of transactions.

6.20 In cases where there are different product types available within one elementary aggregate, but each product type is homogeneous, a unit value index is a preferred method for calculating elementary price indices. A unit value index is simply the quantity-weighted average transaction price for all products within an elementary aggregate in one period, divided by the quantity-weighted average transaction price in the previous period. The rationale for using a unit value calculation must be based on a reasonable assumption that the changes in these average prices do not reflect a change in quality over time. Otherwise the index could be prone to bias.⁷²

6.21 The CPI uses a unit value calculation for the Spectator entertainment index, which includes prices for stadium sports seating and live staged performances. The assumption behind this index is that if the stadium or theatre is full in each of the two periods being compared, there is likely to be no change in the overall quality, even though seats may be valued differently. In effect, the price of all seats in the stadium or theatre is used rather than a few individual seats. A similar approach is used to calculate the Air fares index.

72. Balk (2002) showed that unit value ratios require special consideration, as they are not only driven by price change but can also be driven by changing quantities.

6.22 A unit value calculation is also used in the Property taxes elementary price index. A sample of properties is drawn so that the average annual property tax paid in a given municipality can be calculated. These calculated average annual taxes are then multiplied by the total stock of dwellings in each municipality in order to obtain the average annual property tax paid in each CPI geographical stratum. No attempt is made to control for differences in the quality of services that homeowners receive in exchange for their tax payments from one municipality to another. Additionally, there is no treatment to control for changes in the quality of municipal services from one period to another. Accounting for these differences is impractical as there are no data available which associate specific municipal services to proportions of property taxes paid.⁷³

Calculation of the Consumer Price Index Above Elementary Indices (upper level)

6.23 The calculation of the CPI at the upper level is relatively straightforward compared to the lower level. It involves aggregating calculated elementary price indices by applying an asymmetrically weighted arithmetic fixed-basket formula in order to obtain aggregate indices which culminate in the All-items CPI.⁷⁴

6.24 The Laspeyres formula (6.5) is a basic method for calculating price indices and is consistent with the CPI's fixed basket concept. It expresses the change in the cost between period 0 and period t of buying a fixed basket of products, by aggregating the prices of the products in the basket using quantities consumed from the price reference period 0 as weights.

$$I_{L,A}^{0,t} = \frac{\sum_{i=1}^n p_i^t q_i^0}{\sum_{i=1}^n p_i^0 q_i^0}$$

(6.5)

Where:

$I_{L,A}^{0,t}$ is the Laspeyres price index of aggregate class A between period 0 and t ;

n is the number of elementary aggregates i in the aggregate class A ;

p_i^t is the price of elementary aggregate i , in time t ;

p_i^0 is the price of elementary aggregate i , in time 0; and

q_i^0 is the quantity weight of elementary aggregate i , in the price reference period 0.

73. The treatment of owned accommodation in the Consumer Price Index is discussed in Chapter 10.

74. Some common formulae for calculating aggregate price indices (above the elementary level) can be found in Appendix A.

6.25 In practice, the Laspeyres index is not commonly used to calculate the CPI because it requires information on the quantities consumed⁷⁵ in the price reference period 0 and these data are not available in a timely manner. This has to do with the fact that household expenditure surveys are typically produced with a lag. Therefore, since Statistics Canada aims to produce a CPI that is timely, in that it measures changes in prices for recent periods, the Laspeyres formula must be altered to use quantities from a period preceding the price reference period 0. This transformation is the Lowe formula (6.6), a more general form of a Laspeyres index because the quantities come from a chosen weight reference period b which precedes the price reference period 0.

$$I_{Lo,A}^{0:t} = \frac{\sum_{i=1}^n p_i^t q_i^b}{\sum_{i=1}^n p_i^0 q_i^b} \quad (6.6)$$

Where:

- $I_{Lo,A}^{0:t}$ is the Lowe price index of aggregate class A between period 0 and t ;
- n is the number of elementary aggregates i in the aggregate class A ;
- p_i^t is the price of elementary aggregate i , in time t ;
- p_i^0 is the price of elementary aggregate i , in time 0; and
- q_i^b is the quantity weight of elementary aggregate i , in the weight reference period b , with $b \leq 0 < t$.

6.26 The Lowe index can also be expressed as the weighted sum of elementary price indices (6.7) with the weights expressed as expenditure shares.

$$I_{Lo,A}^{0:t} = \sum_{i=1}^n (p_i^t / p_i^0) s_i^{0b} \quad (6.7)$$

Where:

p_i^t / p_i^0 is the price index of elementary aggregate (i) between period 0 and t , and;

$$s_i^{0b} \equiv \frac{p_i^0 q_i^b}{\sum_{i=1}^n p_i^0 q_i^b} \quad (6.8)$$

6.27 The expenditure shares s_i^{0b} in the Lowe formula (6.7) are hybrid expenditures because the prices and quantities (that equal the expenditures when multiplied) are from different periods, 0 and b .

75. In practice, what are observed are the expenditures, which contain the implicit p and q terms.

- 6.28 Hybrid expenditures (6.8) are obtained by updating the original expenditure weights $p_i^b q_i^b$ (observed in the weight reference period b) to reflect the prices of the price reference period 0 using the price relatives p_i^0 / p_i^b . This process is often referred to as price-updating and thus hybrid expenditure weights are frequently termed price-updated weights.⁷⁶ The use of price-updated or hybrid expenditure weights is essential to the fixed-quantity basket concept of the CPI.
- 6.29 Because the weights used in the calculation of the CPI are obtained from consumer expenditure data with a weight reference period that precedes the price reference period 0, the Lowe index formula is the practical option for computing a timely CPI.
- 6.30 Notwithstanding this practical advantage, the Lowe formula also has many desirable properties. One is its consistency in aggregation. This means that no matter order in which the elementary price indices are aggregated (for example first by geographical stratum and then by product class, or the reverse) the aggregate index results are the same.
- 6.31 Another desirable property of the Lowe formula is its transitivity⁷⁷, whereby the ratio of two Lowe indices using the same set of basket reference quantities q^b is also a Lowe index (6.9).⁷⁸ This property is useful because it enables index compilers to calculate short-term price movements. For example, price change between period $t-1$ and period t can be estimated by taking the ratio of two long-term Lowe price indices, one comparing periods 0 and $t-1$ and the other comparing periods 0 and t .

$$I_{Lo,A}^{t-t'} = \frac{\sum_{i=1}^n p_i^t q_i^b}{\sum_{i=1}^n p_i^{t-1} q_i^b} = \frac{\frac{\sum_{i=1}^n p_i^t q_i^b}{\sum_{i=1}^n p_i^0 q_i^b}}{\frac{\sum_{i=1}^n p_i^{t-1} q_i^b}{\sum_{i=1}^n p_i^0 q_i^b}} = \left(\frac{I_{Lo,A}^{0,t}}{I_{Lo,A}^{0,t-1}} \right) \quad (6.9)$$

Where:

$I_{Lo,A}^{t-t'}$ is the short term Lowe index for aggregate (A) between period $t-1$ and period t ;

$I_{Lo,A}^{0,t}$ is the long term Lowe index for aggregate (A) between period 0 and period t , and;

$I_{Lo,A}^{0,t-1}$ is the long term Lowe index for aggregate (A) between period 0 and period $t-1$.

76. ILO *et al.* (2004), paragraph 1.29.

77. Transitivity is an axiomatic property of index number formulae. Satisfying this property enables price indices to be calculated via chained or direct price comparison. For more information on this property, ILO *et al.* (2004), paragraphs 9.25 and 15.88.

78. ILO *et al.* (2004), paragraph 1.26.

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6.32 The transitive property of the Lowe formula also enables index compilers to calculate long-term price change by chaining together short-term price indices. For example, a Lowe index comparing prices in period t to prices in the price reference period 0 is obtained by multiplying the Lowe index comparing period t to period $t-1$ by the Lowe index comparing period $t-1$ with the price reference period 0 (6.10). The product of monthly chained indices provides identical results to an index that directly compares prices in period t to prices in the price reference period 0.

$$I_{Lo,A}^{0,t} = \underbrace{\left[\frac{\sum_{i=1}^n p_i^1 q_i^b}{\sum_{i=1}^n p_i^0 q_i^b} \right]}_{I_{Lo,A}^{0,1}} \times \underbrace{\left[\frac{\sum_{i=1}^n p_i^2 q_i^b}{\sum_{i=1}^n p_i^1 q_i^b} \right]}_{I_{Lo,A}^{1,2}} \times \dots \times \underbrace{\left[\frac{\sum_{i=1}^n p_i^{t-2} q_i^b}{\sum_{i=1}^n p_i^{t-3} q_i^b} \right]}_{I_{Lo,A}^{t-3,t-2}} \times \underbrace{\left[\frac{\sum_{i=1}^n p_i^{t-1} q_i^b}{\sum_{i=1}^n p_i^{t-2} q_i^b} \right]}_{I_{Lo,A}^{t-2,t-1}} \times \underbrace{\left[\frac{\sum_{i=1}^n p_i^t q_i^b}{\sum_{i=1}^n p_i^{t-1} q_i^b} \right]}_{I_{Lo,A}^{t-1,t}} \quad (6.10)$$

$$I_{Lo,A}^{0,t} = \frac{\sum_{i=1}^n p_i^t q_i^b}{\sum_{i=1}^n p_i^0 q_i^b} \left(\frac{p_i^1}{p_i^0} \right)^{s_i^{t-1b}}$$

Where:

$I_{Lo,A}^{0,t}$ is the long-term Lowe index for aggregate class A between period 0 and t ;

$I_{Lo,A}^{t-1,t}$ is the monthly short-term Lowe index for aggregate A; and

s_i^{t-1b} is the hybrid expenditure share of elementary aggregate i , with quantities from the basket reference period b expressed at period $t-1$ prices, derived as (6.11).

$$s_i^{t-1b} \equiv \frac{p_i^{t-1} q_i^b}{\sum_{i=1}^n p_i^{t-1} q_i^b} \quad (6.11)$$

6.33 In any given period t the hybrid expenditure shares price-updated to period $t-1$ are used to aggregate elementary price indices. Since hybrid expenditure weights are an estimate of the value of purchasing the quantities from the weight reference period b expressed in period $t-1$ prices, they do not reflect changes in consumer purchasing patterns. These are necessary in order to maintain the fixed quantity concept of the Lowe formula.

6.34 In the ongoing practice of compiling the CPI, hybrid expenditure shares (6.11) are not explicitly calculated.

Instead, the equivalent Lowe formula is used (6.12), where monthly price relatives $\left(\frac{p_i^t}{p_i^{t-1}}\right)$ multiplied by hybrid expenditure weights expressed at period $t-1$ prices are compared to the hybrid expenditures expressed at period 0 prices in order to obtain price change between period 0 and t .

$$\begin{aligned}
 I_{Lo,A}^{0,t} &= \frac{\sum_{i=1}^n \left(\frac{p_i^t}{p_i^{t-1}}\right) (p_i^{t-1} q_i^b)}{\sum_{i=1}^n (p_i^0 q_i^b)} \\
 &= \frac{\sum_{i=1}^n \left(\frac{p_i^t}{p_i^{t-1}}\right) \left(\frac{p_i^{t-1}}{p_i^0}\right) (p_i^0 q_i^b)}{\sum_{i=1}^n (p_i^0 q_i^b)}
 \end{aligned}
 \tag{6.12}$$

6.35 Despite all the practical advantages of using the Lowe formula for calculating the upper level of the CPI, it is an asymmetrically weighted price index, meaning that the weights used to aggregate elementary price indices refer to a period preceding the price reference month. For this reason the Lowe formula does not represent the current spending patterns of consumers and therefore is subject to substitution bias.⁷⁹

79. The topic of substitution bias in a Consumer Price Index, as well as the efforts by Statistics Canada to reduce it, are discussed in Chapter 9.

Chapter 7 Quality Change and Adjustment

- 7.1 The Canadian Consumer Price Index (CPI) aims to measure pure price change, thus excluding price changes that are due to differences in the quality of products bought by consumers. It achieves this mostly through the matched-model approach which tracks unchanging products in the same outlets, thus holding all variables constant except for the month when prices are observed.
- 7.2 The universe of products bought and sold in the marketplace changes over time. Updating the sample for any given elementary aggregate is inevitable in order to maintain its representativeness. As products in the market change, observed product offers (POs) may change. This means that the matched-model framework at times does not hold, and therefore price changes could reflect a mixture of price and quality differences. In order to measure pure price change, quality adjustments are performed.
- 7.3 There are multiple techniques, implicit (indirect) and explicit (direct), available to account for quality differences between exiting and entering POs. This chapter will present the different methods used in the CPI.⁸⁰
- 7.4 It is not always necessary or possible to adjust for quality change when a PO must be replaced in the CPI sample. There are various reasons why adjusting for quality change may not be required and a direct price comparison between entering and exiting POs is the best option. Direct price comparison, an implicit method of quality adjustment, is the simplest approach used in the CPI.
- 7.5 The CPI employs the direct price comparison method when there is no perceived difference in quality between entering and exiting POs. This method assumes equivalent quality between POs and is used for just over 30%, by basket weight, of the elementary indices.⁸¹
- 7.6 The use of the direct price comparison method for these elementary indices is not likely to lead to any systematic bias in the CPI because the majority of these indices fall under one of the following categories.
- 7.6.1 No appreciable quality change: Many items like gasoline, electricity or natural gas are essentially of the same quality over long periods of time.
- 7.6.2 Non-market services: Most government-regulated services, such as university education, local transportation or passports, do not receive any treatment for quality change. While it could be argued that the quality of these services may change through time, this is likely to happen very slowly and is difficult to measure. These services are also not available in a competitive market so little can be said about the market valuation of the quality features that are implied.
- 7.6.3 Bestsellers method: In the case of popular media, such as books, movies or DVDs, it is common international practice to simply aggregate the prices of the top bestsellers and compare the result to that for the previous period's bestsellers, even if these best sellers are different in the two periods. This is because the novelty of the product's content is what is being sought out by consumers, rather than any tangible physical characteristic such as number of pages or quality of the binding, to take books as an example.
- 7.6.4 The use of the unit value index method also eliminates the need for any further quality adjustment. This index calculation method is rarely used in the CPI and can only be applied in cases where it is assumed that the average quality represented remains constant through time.⁸²

80. The different quality adjustment methods used for the basic classes in the Consumer Price Index are indicated in Appendix B.

81. The proportion of elementary indices is based on 2011 basket weights. Statistics Canada, Survey number 2301.

82. The unit value method is discussed in paragraph 6.22.

- 7.7 The use of overlap pricing can also eliminate or significantly reduce the need to make explicit quality adjustments. This implicit method allows for the reduction of unexpected disappearances of sampled POs and ensures that new representative products can be introduced into the sample before the replaced ones disappear from the market or become unrepresentative. The overlap pricing method is most commonly used in conjunction with the profiles method, enabling the collection of a replacement profile before the obsolescence of an existing one.⁸³
- 7.8 Overall mean imputation is another implicit method used in the CPI to make quality adjustments between the prices of POs entering and exiting the sample. With this method, the price movement applied to entering POs is based on the observed average price movement of all other POs for the same representative product. Overall mean imputation relies on the assumption that the donor POs are comparable to the PO being imputed.
- 7.9 The link-to-show-no-change method for quality adjustment, another indirect method, involves forcing a price relative of unity (equals no price change) when replacement POs enter the sample. Currently, this practice is being reduced across the CPI because it introduces a degree of undue price stability in the index.⁸⁴
- 7.10 Quantity adjustment entails accounting for changes in the quantity (e.g. package size, number of tissue ply etc.) of observed POs. This is another implicit method of quality adjustment because it is assumed that the quality per standardized unit is the same over time.
- 7.11 Quantity adjustment is the default treatment for nearly all of the POs in the Food major aggregate as well as some of the products in the Household operations, and Personal care supplies and equipment aggregates.⁸⁵
- 7.12 For the majority of elementary indices, not covered by the implicit methods described above, it is necessary to make explicit quality adjustments when POs enter or exit the sample.
- 7.13 To make the appropriate quality comparison, Statistics Canada is usually guided by market valuations of the two POs. Where possible, the two POs are compared in terms of the quality features they offer to consumers. A PO is thought to provide a range of features to the consumer which, grouped together, determine the market price.⁸⁶ This general framework is the basis for many of the explicit quality adjustment methods described below.
- 7.14 The CPI relies on the hedonic quality adjustment technique for certain elementary aggregates, notably in the case of high technology goods or services. Currently, the CPI uses hedonic quality adjustment for the Computer equipment, software and supplies and Internet access services indices. The hedonic method of quality adjustment is most appropriate for products whose markets are competitive and experience rapid turnover, and where the characteristics of these products change quickly but are readily and consistently observable.
- 7.15 The hedonic method is applied in the case of forced replacements. This approach assumes that a relationship exists between the price of a PO and its characteristics. Hedonic specifications have to be defined using standard regression techniques.⁸⁷ In period t (when a previously observed PO is no longer available) a regression is used to estimate the unobserved price for the entering PO in period $t-1$. The estimation of the $t-1$ price is based on quality differences between the entering and exiting POs, as well as the $t-1$ price of the exiting PO.

83. While the Internet services elementary index is calculated using the profiles method, adjusting for quality differences between exiting and entering profiles is done via hedonic quality adjustment in this case.

84. ILO *et al.* (2004), paragraph 7.70.

85. The weight of these expenditure categories can be seen in Appendix B.

86. The characteristics approach was introduced by Lancaster (1966). Consistent with a characteristics approach, ILO *et al.* (2004) defines a product, for measurement purposes, as equating to a complete description of its price-determining characteristics. For a Consumer Price Index program, the demand side of the equation is relevant (consumers' valuation of these characteristics), rather than the supply side (producers' costs or inventory).

87. The functional form is selected from a large family of Box-Cox transformations using appropriate statistical tests.

7.16 A semi-log hedonic regression is used for the Computer equipment, software and supplies index. It takes the general form:

$$\ln(p'_n) = \beta_0 + \sum_{i=1}^k \beta_i X'_{i,n} + e'_n \quad (7.1)$$

Where:

β_i is a range of effects for a set of k characteristics $X'_{i,n}$, $i = 1, 2, \dots, k$, that are used to explain variations in the natural log of the price.

7.17 Coefficients of the semi-log hedonic regression are estimated once a year using product characteristics data and retail prices obtained from the Internet and third party databases. All other things being equal, a coefficient represents the impact of a given product characteristic on price movement.

7.18 For the Internet access services elementary aggregate, a double log functional form is used. Statistical analysis found that this model better explained the variation in prices of various consumer bundles offered by several Internet service providers. This means the natural logarithm of price is explained by the logarithm of the explanatory variables. The formula is:

$$\ln(p'_n) = \beta_0 + \beta_1 \ln(X'_{i,n}) + \beta_2 \ln(X'_{i,n})^2 + e'_n \quad (7.2)$$

Where:

β_i is a range of effects for a set of k characteristics X_i , $i = 1, 2, \dots, k$, that explain variations in the natural log of the price.

7.19 The option cost method is another explicit approach for making quality adjustments to entering POs in the CPI sample. This technique relies on having data about the specific costs for adding options or quality characteristics to a product. In this explicit method, an adjustment to the last observed price of the exiting PO is made so that it can be compared with the observed price of the entering PO. The option cost method is most commonly used for products where the manufacturer or retailer provides pricing details for the available product characteristics. The CPI uses the option cost method in the elementary aggregates corresponding to the Purchase of passenger vehicles index.

7.20 Expert judgment has, in the past, been a predominant practice for explicit quality adjustment in the CPI. This relies upon an employee with expertise in a particular product market to assess and give a valuation to differences in quality between exiting and entering POs. However, the practice of quality adjustment by expert judgment is not arbitrary⁸⁸ and follows procedural guidelines for choosing the most plausible quality ratio between exiting and entering POs. The expert judgment method is primarily used for elementary indices under the Clothing and footwear major aggregate.

7.21 The option cost and expert judgment explicit approaches to quality adjustment are used in the CPI for cases where a complex decision has to be made, and where it is not appropriate to apply an implicit method such as overall mean imputation.

88. The expert judgment method has been evaluated internally by Statistics Canada using variance analysis (ANOVA). The goal of this analysis was to test whether average price differed according to the characteristics relied on by the subject matter experts. In 85% of cases the characteristics used by the expert were those which explained differences in average prices.

Chapter 8 Weights and Basket Updates

Meaning and Construction of the Consumer Price Index Weights

- 8.1 The Consumer Price Index (CPI) basket weights are expenditures derived primarily from the Survey of Household Spending (SHS) for a given reference year.⁸⁹ The basket weights are actually hybrid expenditures, meaning that the prices and quantities of the expenditures come from different periods. Hybrid expenditure weights are essential to the fixed-basket concept of the CPI.⁹⁰
- 8.2 Generally speaking, the SHS is designed to provide information on spending by private households that is detailed enough for, and consistent with the CPI scope and definitions. The CPI weights are constructed from aggregate household expenditures. This type of weighting, known as plutocratic, implies that each household contributes to the total weight of an elementary aggregate proportionally to their respective spending.⁹¹
- 8.3 For the most part the SHS is used to derive the weights for the elementary aggregates by concurring the SHS estimates to the product and geographical classifications of the CPI. However, the SHS sometimes does not provide sufficient detail and thus basket weights are in some instances constructed from alternative sources.
- 8.4 The basket weights for the Replacement cost and Mortgage interest cost elementary indices are two examples in which supplementary data are required to construct the weight.⁹² Additionally, alternative data sources which include other Statistics Canada surveys, administrative data and scanner data from retailers are used to break down aggregate expenditures further for product classes in which the SHS does not provide sufficient detail.
- 8.5 Supplementary data are also used to confront specific SHS expenditure estimates which may be suspected of bias. For example, expenditures for alcohol and tobacco are often thought to be under-reported in household expenditure surveys, as the survey estimates are typically lower than reported in retail sales and government excise tax revenue data.⁹³
- 8.6 At the time of a basket update, Statistics Canada also uses the Bortkiewicz-Szulc decomposition to evaluate expenditures used as basket weights.⁹⁴ This method compares relative changes in quantities with the corresponding relative changes in prices in order to assess the reliability of the expenditure weights.
- 8.7 Assessing the quality of expenditure data also helps Statistics Canada determine the number of basic classes in the CPI (that is, the levels in the product and geographical classifications at which the quantity weights are fixed for the duration of a basket).⁹⁵
- 8.8 Basic classes are determined based on the availability and quality of the consumer expenditure data as well as the stability of the distribution of spending within elementary aggregates. For example, if the distribution of consumer spending within a given elementary aggregate changes frequently, then it is may be advantageous to allow the quantities in the expenditure weight to be updated when new information on consumer spending is available. In such a case Statistics Canada will designate the basic class to be the one above the elementary aggregates where quantities may be updated during the life of the basket.
- 8.9 The practice of changing the quantities below the basic class level between basket updates provides benefits in that it allows for new information on consumer spending to be incorporated into the CPI in a timely manner.

89. Statistics Canada, Survey number 3508.

90. The calculation of a fixed-quantity-weighted price index is discussed in Chapter 6. However, the quantities themselves are not directly observed, but are rather implicitly contained in the expenditures.

91. ILO *et al.* (2004), paragraph 18.2.

92. The treatment of owned accommodation in the Consumer Price Index is discussed in Chapter 10.

93. The quality of expenditure data are evaluated using outlier detection across basket reference years, micro data analysis, as well as coefficient of variation (CV) analysis.

94. Chaffe *et al.* (2007).

95. The meaning and use of basic classes in the Consumer Price Index is discussed in Chapter 4.

Updating the Consumer Price Index Basket

- 8.10** The process of updating the CPI basket is to make the weights assigned to elementary aggregates representative of current consumer spending patterns. In the past, the basket for the CPI was updated every four to five years⁹⁶ using new expenditure data from the most recent SHS. Starting with the 2011 basket update, the CPI weights are updated biennially. While there is no rule as to how often a CPI basket should be updated, there is general agreement among CPI compilers that more frequent basket updates are preferred.⁹⁷
- 8.11** In addition to updating and assuring the quality of the weights, the exercise of a basket update also provides an opportunity to review and update other aspects of the indices which may include:
- 8.11.1** Changing the product and/or geographical classifications to be more representative.
 - 8.11.2** Reviewing and updating the sample of representative products and outlets.
 - 8.11.3** Updating weights below the elementary aggregate level.
 - 8.11.4** Reviewing methods and concepts for the elementary indices.
 - 8.11.5** Updating documentation and products for dissemination.
- 8.12** The final stage of a basket update is to chain-link the new fixed-quantity basket to the old fixed-quantity basket in order to produce indices that are a continuous time series. For this reason, the CPI is referred to as a chain of fixed-basket indices.

Chain-linking Indices Across Baskets

- 8.13** Published consumer price indices are calculated as a chain of fixed-basket indices. This means that a sequence of fixed-basket indices have been chained together to create a continuous time series. This type of chaining is not to be confused with the calculation of monthly chained indices⁹⁸ but rather refers to the process of chaining indices across baskets. This is necessary to avoid having breaks in an index when a basket update is performed.
- 8.14** Chain-linking indices across baskets takes place at the time of a basket update. In order to chain indices across baskets, hybrid expenditure weights for the old and new baskets must be expressed at the prices of a common period. This common period is called the link month.
- 8.15** Link month weights are obtained by price-updating the original expenditure weights to obtain the hybrid expenditures expressed at prices of the link month.
- 8.16** Since the basket reference period b of the CPI is a *full year*, a process called weight adjustment is necessary to obtain *monthly* hybrid expenditures for the link month. Monthly hybrid expenditures for the link month are calculated in two steps.
- 8.17** First, the annual expenditures for the basket reference year b are divided by the average price change for the basket reference year. This calculation provides a monthly expenditure, called the initial value, for the month preceding the basket reference year b . This first step implicitly assumes that the quantities of the basket are constant for each month of the basket reference year.
- 8.18** In the second step, the initial values are price updated to the link month in order to express the value of the fixed quantities of the basket at the prices of the link month.⁹⁹ Once the link month hybrid expenditures for the new basket are obtained, aggregate indices can be calculated using the new basket.

96. A chronology of basket updates of the Consumer Price Index is provided in Chapter 11 and Appendix C.

97. One of the findings of Boskin *et al.* (1996) was that having more current expenditure weights could reduce the substitution bias in a Consumer Price Index.

98. The monthly chained form of the Lowe index is discussed in Chapter 6.

99. Statistics Canada publishes two sets of Consumer Price Index basket weights. One expresses the values of the fixed-quantity basket at basket reference prices and the other at basket link month prices. Statistics Canada, Survey number 2301.

8.19 In the month following the basket link month, price indices calculated using the new basket are multiplied by the index levels previously published for the old basket.

8.20 Chain-linking of indices is done separately for each basic class.¹⁰⁰ Currently the CPI is published with an index reference period of 2002=100. In 2002 the CPI was based on the 1996 basket. Since the 1996 basket there have been six basket updates with the following link months:

- 2001 basket linked in December 2002;
- 2001 revised basket linked in June 2004;
- 2005 basket linked in April 2007;
- 2009 basket linked in April 2011;
- 2011 basket linked in January 2013 and
- 2013 basket linked in December 2014.

8.21 Following the introduction of the 2011 basket, any chain-linked index with an index reference period of 2002=100 is a chain of six fixed-baskets (8.1).

$$I_{chained}^{2002:t} = I_{2013}^{Dec2014:t} \times I_{2011}^{Jan2013:Dec2014} \times I_{2009}^{Apr2011:Jan2013} \times I_{2005}^{Apr2007:Apr2011} \times I_{2001r}^{Jun2004:Apr2007} \times I_{2001}^{Dec2002:Jun2004} \times I_{1996}^{2002:Dec2002} \quad (8.1)$$

Where:

$I_{chained}^{2002:t}$ is a chained index for the price observation period t with a price reference period equal to 2002;

$I_{2013}^{Dec2014:t}$ is an index for the price observation period t with December 2014 as the price reference period, calculated using the 2013 basket;

$I_{2011}^{Jan2013:Dec2014}$ is an index for December 2014 with January 2013 as the price reference period, calculated using the 2011 basket;

$I_{2009}^{Apr2011:Jan2013}$ is an index for January 2013 with April 2011 as the price reference period, calculated using the 2009 basket;

$I_{2005}^{Apr2007:Apr2011}$ is an index for April 2011 with April 2007 as the price reference period, calculated using the 2005 basket;

$I_{2001r}^{Jun2004:Apr2007}$ is an index for April 2007 with June 2004 as the price reference period, calculated using the 2001 revised basket;

$I_{2001}^{Dec2002:Jun2004}$ is an index for June 2004 with December 2002 as the price reference period, calculated using the 2001 basket;

$I_{1996}^{2002:Dec2002}$ is an index for December 2002 with 2002 as the price reference period, calculated using the 1996 basket.

100. It should be noted that the method of chain-linking indices across baskets is such that aggregate indices are not the direct average of their respective sub-indices. In exceptional cases, this may cause the level of an aggregate index to fall slightly outside the range of its sub-indices. ILO *et al.* (2004), paragraph 9.113.

Contributions to Index Percentage Change Across Baskets

8.22 The calculation of contributions to percentage change must be modified when the 12-month percentage change of an index spans two baskets, that is, when a basket update was performed between the two periods of comparison (period t and period $t-12$). This is because indices chained across baskets are computed using more than one fixed basket. Hence there can be no single expression of the importance (weight) of each sub-aggregate.¹⁰¹

8.23 The 12-month contribution to change for a composite price index that is chained across two baskets

$\left(\frac{I_A^{0:t}}{I_A^{0:t-12}} - 1\right)$ is calculated in two parts. The first relates to the old basket and the second to the new basket.

Unchained indices must be used to derive contributions across baskets (8.2).

$$\left(\frac{I_A^{0:t}}{I_A^{0:t-12}} - 1\right) = \underbrace{\left[\sum_i \left(\frac{I_i^{0:link}}{I_i^{0:t-12}} - 1\right) \times W_i^{t-12_old}\right]}_{\text{old basket contributions}} + \underbrace{\left[\sum_i \left(\frac{I_i^{link:t}}{I_i^{link:link}} - 1\right) \times W_i^{link_new} \times I_A^{t-12:link}\right]}_{\text{new basket contributions}}$$

$$\text{with } I_i^{link:link} = 100$$

(8.2)

Where:

$W_i^{t-12_old}$ is the weight of component i according to the old basket valued at the $t-12$ period price;

$W_i^{link_new}$ is the weight of component i according to the new basket valued at the link month period price; and

$I_A^{t-12:link}$ is the aggregate index in the link month with price reference period $t-12$.

8.24 When calculating contributions to 12-month percentage change on an index that spans across two baskets, it is possible that the summed old basket contributions and summed new basket contributions have opposite signs (+/-). The resulting contribution to the 12-month percentage change in the aggregate index could therefore have the opposite sign of the corresponding 12-month percentage change in the index. In other words, a given sub-aggregate can have a positive 12-month contribution to its aggregate while posting a negative 12-month price change and vice-versa.

101. Contributions to price index change are discussed in Chapter 2.

Rebasing an Index

- 8.25 As discussed in Chapter 2, the index reference period or index base period is the period in which the index is set to equal 100. For the CPI, the index base period is usually a calendar year expressed as "index year=100". Currently the index base period for the CPI is 2002=100. However, the index reference period of the CPI is changed periodically to coincide with the index base period of other major economic indicators produced by Statistics Canada. The process of changing the index base period is known as rebasing.
- 8.26 There are many reasons why users may need CPI series with index base periods other than those used in the published CPI. For example, they might need a series whose index reference period corresponds to the starting period of a particular wage or payment contract, so they can easily calculate the adjustments to be made. Those interested in comparing consumer price changes between countries might need a CPI series on an index reference period that corresponds with the index base period of another country. The need to change the index base period of CPI series may also result from the technical requirements of an index computation procedure, such as chain-linking across baskets.
- 8.27 The rebasing of an index (that is, its conversion from one index reference period to another) is an arithmetic operation that does not affect the rate of price change measured by the series between any two periods. To rebase an index $I^{g:t}$ to express it for a new index reference period g , all values in the index time series are divided by a constant. This constant $I^{g:h}$ is an index for price observation period h (which will be the new index reference period) with the initial index reference period g . The calculated results are then multiplied by 100 in order to obtain the new rebased index, with index reference period h equal to 100.

$$I^{h:t} = \frac{I^{g:t}}{I^{g:h}} \times 100$$

(8.3)

Where:

$I^{h:t}$ is the index for a price observation period t with the new index reference period h ;

$I^{g:t}$ is the index for a price observation period t with the initial index reference period g ; and

$I^{g:h}$ is the index for price observation period h with the initial index reference period g .

- 8.28 As an example take the All-items CPI for Canada published with an index reference period 2002=100. An extract of this series is shown in Table 8.1 in the column headed $I^{2002:t}$. These indices have been converted into the following two new index reference periods: January 2012=100 and 2012=100. They are presented in Table 8.1 in the columns headed $I^{Jan2012:t}$ and $I^{2012:t}$.
- 8.29 To calculate $I^{Jan2012:t}$ using the original index $I^{2002:t}$ the series is divided by the constant $I^{2002:Jan2012}$. To calculate $I^{2012:t}$ using the original index $I^{2002:t}$ the series is divided by the constant $I^{2002:2012}$.

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Table 8.1
Example of Index Rebasing

Index price observation period t	$I_{2002,t}$	$I_{2012,t}$	$I_{2012,t}$
Jan-12	120.7	100.0=	99.2=
		$\frac{I_{2002:Jan2012}}{I_{2002:Jan2012}} \times 100 = \frac{120.7}{120.7} \times 100$	$\frac{I_{2002:Jan2012}}{I_{2012:Jan2012}} \times 100 = \frac{120.7}{121.7} \times 100$
Feb-12	121.2	100.4	99.6
Mar-12	121.7	100.8	100.0
Apr-12	122.2	101.2	100.4
May-12	122.1	101.2	100.3
Jun-12	121.6	100.7	99.9
Jul-12	121.5	100.7	99.9
Aug-12	121.8	100.9	100.1
Sep-12	122.0	101.1	100.3
Oct-12	122.2	101.2	100.4
Nov-12	121.9	101.0	100.2
Dec-12	121.2	100.4	99.6
2012 average	121.7	100.9	100.0
Jan-13	121.3	100.5	99.7
Feb-13	122.7	101.7	100.8
Mar-13	122.9	101.8	101.0
Apr-13	122.7	101.7	100.8
May-13	123.0	101.9	101.1
Jun-13	123.0	101.9 =	101.1=
		$\frac{I_{2002:Jun2013}}{I_{2002:Jan2012}} \times 100 = \frac{123}{120.7} \times 100$	$\frac{I_{2002:Jun2013}}{I_{2012:Jan2012}} \times 100 = \frac{123}{121.7} \times 100$

Source: Statistics Canada, CANSIM Table 326-0020.

8.30 Since all indices in any given column of Table 8.1 are derived from original indices with an index reference period 2002=100 divided by a constant, the rate of price change in all the rebased series is the same as in the original series. Small differences in percentage changes may result due to rounding when average index values are calculated. It should be noted, however, that differences between index levels, sometimes referred to as differences in index points, vary with the change of the index reference period. Therefore, users who would like to use the CPI for purposes of indexation are advised to use the rate of price change (the percentage change between index values) rather than using the difference in index points.

Chapter 9 Reliability and Uncertainty

- 9.1 The Consumer Price Index (CPI) is widely used and trusted by Canadians. The index is never revised, which means it can be used to settle contracts without concern that those contracts may have to be reopened at a later time. The index release dates are typically announced a year in advance and firmly adhered to. The data usually become available three weeks after the price observation period. The index is available in considerable detail and without charge from Statistics Canada.¹⁰²
- 9.2 As a sample-based statistic, the CPI, like all such statistics, cannot with 100% accuracy estimate the underlying (but unobserved) 'true' value it aims to measure. Nevertheless, the size of any statistical error or bias associated with the CPI is likely to be small enough to be within the range of tolerance of most users.
- 9.3 This chapter is about the error and bias properties of the CPI. Error refers to non-systematic inaccuracies introduced potentially at all stages of estimation. Errors which are systematic, meaning they lead to consistent over- or under-estimation of the phenomenon being measured, are called biases.¹⁰³
- 9.4 The goal of this chapter is to inform users about the various ways in which statistical and non-statistical error gets into the CPI and the steps taken by Statistics Canada to minimize the error. The chapter is organized under two main themes. One is the error associated with the estimation of indices at the lower level, while the other discusses the error entering into the calculation of the CPI at the upper level.

Error at the Lower Level of Consumer Price Index Calculation

- 9.5 Since elementary price indices are derived from statistical samples, they are subject to sampling errors. These errors will surely have sampling variance¹⁰⁴ and they may also have statistical bias, although efforts are made to minimize any such bias.¹⁰⁵ Other things being equal, a larger sample size should yield a smaller sampling variance for a given elementary index.
- 9.6 Most of Statistics Canada's surveys have samples drawn randomly from a frame of all in-scope units. Information about the number and size of units in the statistical population makes it possible to analyze the sample properties and calculate estimates of the variance and bias associated with any calculated estimates. If this were the case for the CPI it would be possible to report, for each elementary price index, a corresponding estimate of its sampling variance and bias. However, no comprehensive frame of all consumer products is available and for this reason it is generally not possible to estimate the variance and bias of elementary price indices.
- 9.7 For a small number of elementary aggregates in the CPI – notably drivers' licenses, passenger and vehicle registration fees – a single price rules the market within each geographical stratum. As a result, these elementary price indices do not have sampling error.
- 9.8 There are also cases where, although prices vary, information is available on virtually all consumer transactions and therefore estimates of price change have minimal sampling error. An example of such a case is the Tuition fees index in the CPI where data are available on prices and enrolment by program for every university.

102. Availability of the Consumer Price Index data from Statistics Canada is discussed in Chapter 2.

103. Statistics Canada (2003), paragraph 3.4.2.

104. Sampling variance is the extent to which the estimate of a characteristic from different possible samples of the same size and the same design differ from one another. Statistics Canada (2003), paragraph 3.4.1.

105. The current Canada-level sample size for each basic class in the Consumer Price Index is shown in Appendix B.

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- 9.9 In the CPI there are also some elementary price indices that are not calculated via sampling and price observation, but rather by imputation.¹⁰⁶ For the most part these elementary aggregates are individually small residual groupings of products that serve to make the classification exhaustive.¹⁰⁷ The statistical error of these imputed elementary price indices would be similar to those of the donor indices. Since many of these imputed elementary price indices are “catch-all” categories, which are individually and small and dispersed across the CPI basket, it is unlikely this estimation method results in a significant increase in the error of the CPI.
- 9.10 In an ideal, simple situation an elementary aggregate would refer to a group of homogenous products and accurate information on the prices and quantities of all consumer transactions would be available in a timely manner. In such a case, the average transaction price (unit value) for one month divided by the average price in the previous month would provide an accurate estimate of price change for the elementary aggregate.
- 9.11 In reality, product classes are rarely fully homogeneous and full transactions information is rarely available. For this reason elementary price indices must be estimated using sampling methods.¹⁰⁸ Additionally, elementary aggregates in the CPI usually include many varieties of competing products and outlets entering and exiting the market. Because of these complexities, which are common to most elementary aggregates, there is potential for error at the lower level of CPI estimation.
- 9.12 The general sampling approach for the CPI involves three stages.¹⁰⁹ Two of the stages (geography and outlets) use full or partial frames for the selection of sampling units. However, there is no comprehensive frame for all products that consumers buy. Therefore, in the vast majority of cases, the third stage, in which representative products are designated, is done judgmentally. Sampling error can be introduced at any of the stages of the sample selection process. The potential for sampling error is greater in the selection of outlets and greatest for products because there is no comprehensive frame from which to select units for sampling. Since the CPI sample is selected using some partial frames and judgmental methods it is not possible to estimate accurately the sampling error of elementary price indices.
- 9.13 Error at the lower-level of the CPI may arise because of delays in introducing new products into the sample in a timely manner. The matched-model approach used in the CPI requires comparison of identical product offers (POs) over time and as a result there is a delay between the time when new products appear in the market and when their corresponding price movements are captured in the CPI. This type of error can never be completely eliminated while continuing to use the matched model approach. However, such errors can be mitigated with improved and timely sample management.¹¹⁰

106. The assumption behind the treatment of these elementary aggregates is that the price movements of their unobserved products move in parallel with the price movement of observed products in the donor class. The sampling strategy for the Consumer Price Index is discussed in Chapter 5.

107. Individually these elementary aggregates hold a small weight in the Consumer Price Index (CPI) basket. Together, they represent approximately 12% of the CPI by expenditure weight according to the 2013 basket. Statistics Canada, Survey number 2301. Indices calculated via imputation can be seen in Appendix B as the basic classes with a sample size of zero.

108. The sampling strategy for the Consumer Price Index is discussed in Chapter 5.

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110. The sampling strategy for the Consumer Price Index is discussed in Chapter 5.

- 9.14** As with new products, a delay in the introduction of new outlets into the CPI sample can be a source of error. In a competitive retail market, new outlets appear from time to time offering different levels of services or prices. As a result consumers may change where they shop. The CPI does not immediately capture price movements resulting from changes in the retail landscape because the outlet sample is not redrawn every month. As a result, error from outlet substitution can occur.¹¹¹ To counteract this type of error, the CPI outlet sample needs to be refreshed frequently to capture price movements in new outlets.
- 9.15** Bias arising from the emergence of new outlets occurs when new stores enter the market offering lower prices, thereby inducing consumers to switch outlets. Again this is a difficult source of potential bias to avoid completely, but efforts are made to refresh the outlet sample periodically to minimize this kind of bias.
- 9.16** Other types of error associated with the estimation of elementary price indices include various processing and clerical errors. Error can arise due to the various corrections and adjustments that are made to collected prices. The different methods used to adjust for quality change in the CPI can be imperfect and as such represent a source of error. However, effort is taken to continuously review the methods used and ensure the most appropriate quality adjustment methods are applied. Previous studies have found little indication that quality adjustments across the elementary aggregates of the CPI are consistently biased in an upward or downward direction.¹¹²
- 9.17** Clerical errors might occur when POs are being recorded by the price interviewers. However, efforts are made to minimize errors of this kind. The Computer Assisted Personal Interviewer (CAPI) devices used by the price interviewers include automatic tolerance checks and alert the price interviewers of any suspicious values as they are transcribed. In addition, once the data have been transmitted to Statistics Canada headquarters they are subjected to further verification and analysis. When unusual prices or price movements are detected, subject matter experts sometimes send a "Request for Additional Information" memo back to the price interviewers to obtain additional explanatory information on the PO.
- 9.18** Consumer Price Index calculations are carried out with computer software, which largely eliminates the possibility of arithmetic errors. However, the potential for programming errors is present. In 2001 a new methodology was introduced for the Traveller accommodation elementary price index and errors were made in programming the algorithm for the new method. When the error was discovered and corrected a few years later, it was found to have caused a downward bias in the elementary index. Since that time, more rigorous testing procedures have been put in place to ensure such errors do not go undetected.
- 9.19** The CPI sampling strategy makes use of sample frames when selecting geographical collection areas, outlets and some products.¹¹³ These frames can be subject to different types of error. For instance, there are likely to be delays in updating the outlet frame to include new in-scope units and to remove units no longer in scope. In addition, information about the size of individual units – typically sales data – are also subject to possible error. Some of this information comes from administrative data sources such as tax records and some is derived from other Statistics Canada surveys. In either case, the unit size information is typically subject to both sampling and non-sampling error.

111. Hayman (2006).

112. Rossiter (2005) and Sabourin (2012). Kryvtsov (2013) demonstrates that quality adjustment bias by itself is very small in the Canadian Consumer Price Index.

113. The sampling strategy for the Consumer Price Index is discussed in Chapter 5.

Error at the Upper Level of Consumer Price Index Calculation

- 9.20 The calculation of price indices at the upper level of the CPI is accomplished using the Lowe price index formula. To estimate any particular aggregate index, a weighted average of its component elementary price indices is calculated. There are two possible sources of error in this calculation, both of which relate to the basket weights used in the aggregation. The first refers to errors that could be present in the expenditure estimates used as weights. The second is substitution bias which stems from the use of the Lowe formula at the upper level.
- 9.21 The Survey of Household Spending (SHS) and additional data sources used to derive the CPI basket weights are all subject to both sampling and non-sampling error.¹¹⁴ Statistical errors in the CPI basket weights can have an important effect on measured price change for aggregate price indices in the short run. However, empirical studies suggest variations in the basket weights are unlikely to have a big impact on the calculation of the All-items CPI over longer periods of time.¹¹⁵
- 9.22 The other potential source of error with respect to the basket weights is referred to as upper-level substitution bias. This bias arises because of the use of the Lowe formula, which is an asymmetrically weighted fixed-basket price index. Because the weights are obtained from a year that precedes the price reference period, the expenditures are not likely to be fully representative of consumer spending patterns in the price observation periods. This is because consumers tend to adjust their spending habits in response to changes in relative prices, buying more of the products whose prices have fallen or risen less rapidly, while reducing their purchases of products whose prices have increased the most. In other words, they substitute towards relatively cheaper products from relatively more expensive ones. The asymmetrically weighted fixed-basket formula of the CPI does not account for these types of changes in consumer spending until a basket update is performed.
- 9.23 Unlike the Lowe formula, there are five known symmetrically weighted price index formulae¹¹⁶ which are theoretically free from upper level substitution bias. These index formulae use expenditures from both the price reference period 0 and the price observation period t and therefore account for product substitutions that consumers may make. In this regard they are representative of consumer spending for the periods in which price change is being calculated.
- 9.24 While it would be preferable to calculate the CPI using a symmetrically weighted price index formula, current period expenditure weights are not available to support a timely production of the CPI. The non-revision policy¹¹⁷ of the CPI also does not facilitate the use of forecasted current period expenditures in the calculation of the official CPI.
- 9.25 While maintaining the use of the Lowe formula, steps are taken to reduce the upper level substitution bias by updating the expenditure weights frequently and implementing them with minimal time lag. Statistics Canada took a major step forward in this regard when it switched from a four-year basket update cycle to a two-year cycle and implemented the 2011 basket with the release of the February 2013 CPI. In addition, the lag with which the new basket was implemented was reduced from 18 months to 15 months.¹¹⁸
- 9.26 Upper-level substitution bias in the CPI can be estimated "after the fact" for past periods by comparing the results of the official CPI calculated with the Lowe formula to those calculated using one of the five symmetrically weighted indices, once the expenditures data become available.¹¹⁹

114. The Consumer Price Index basket weights are discussed in Chapter 8.

115. Chiru (2005).

116. The symmetrically weighted price index formulae are: Fisher, Törnqvist-Theil, Walsh, Drobisch and Marshall-Edgeworth. The results of these indices tend to be extremely close to one another as shown in Huang *et al.* (2013). Some of these formulae are shown in Appendix A.

117. The availability and non-revision policy of the Consumer Price Index are discussed in Chapter 2.

118. A chronology of basket updates of the Consumer Price Index is discussed in Chapter 11 and displayed in Appendix C.

119. Huang *et al.* (2013).

Chapter 10 Treatment of Owned Accommodation and Seasonal Products

Concepts Surrounding the Treatment of Owned Accommodation

- 10.1** The treatment of owned accommodation is one of the most difficult problems encountered when constructing consumer price indices. There is probably no other component that is treated in so many different ways by statistical agencies of various countries. The different treatments are in response to both the complex nature of homeownership, which creates problems in identifying and measuring price changes associated with homeownership, and the diversity of users' requirements with respect to the Consumer Price Index (CPI).¹²⁰
- 10.2** Conceptually, an owner-occupied dwelling may be regarded as either a capital good or a consumer good, or both. Statistical agencies that adopt the former view exclude owned accommodation from their consumer price indices. In other words, no effect of price changes associated with the cost of purchasing and using owned accommodation is reflected in the CPI.
- 10.3** Agencies that regard owner-occupied dwellings as consumer goods have several options. One approach is to treat owner-occupied dwellings the same way other durable goods are treated in the CPI, that is, by using the value of net purchases of dwellings in a specified year to derive the basket weight of the index and purchase prices of dwellings to measure price changes for the owned accommodation component.
- 10.4** A second approach is to take into account the shelter services that are provided by owned accommodation. Since these services, in themselves, are not objects of market transactions, their price movement can only be imputed from other series, such as the rent price index. When this rental equivalence approach is strictly applied, the basket weight assigned to the owned accommodation component is based on the estimated rental value of owner-occupied dwellings. The rental equivalence approach has the merit of being consistent with the conventional treatment of owned accommodation in the "Personal expenditure on consumer goods and services" component of the Canadian System of National Accounts (CSNA).¹²¹
- 10.5** Thirdly, the statistical agencies of several countries represent the price movement of the services provided by owner-occupied dwellings with indicators that estimate the effect of price changes on the cost of using dwellings. However, not all countries use the same cost elements. When this user cost approach is applied, the basket weight assigned to owned accommodation is derived from actual or imputed cost elements (imputations may be made for unobserved costs such as the forgone interest on the homeowner's capital invested in the dwelling). Some countries decline to include any imputed cost components in the owned accommodation index. Only expenses involving actual cash disbursements are thus included, so this approach is referred to as a money outlays variant of the user cost approach.
- 10.6** The owned accommodation component seems to be a good illustration of the truism that no single series of consumer price indices can serve well all purposes for which the CPI is commonly used. For example, the rental equivalence approach is fully satisfactory when indices are to be used for deflating the current dollar series within the "Personal expenditure on consumer goods and services" component of the CSNA. This is because the estimated rental value of owner-occupied dwellings is conventionally included in that statistical program. Similarly, if a consumer price index is intended to measure retail price changes, then the movement of current prices of dwellings (and possibly, the movement of current mortgage interest rates) ought to be reflected in the index of owned accommodation.

120. Baldwin *et al.* (2009).

121. Statistics Canada (2008).

10.7 Neither of these approaches, however, seems to be particularly suitable for measuring the effect of price changes on the purchasing power of the consumer dollar. The use of the rental equivalence approach for this purpose is questionable, because the purchasing power of homeowners is neither directly dependent on rent changes nor is it necessarily correlated with these changes, especially in the short-to-medium term. The use of current changes in dwelling prices is not appropriate for the above purpose either, because most homeowners continue to pay for their dwellings during many years after the purchase. Accordingly, the purchasing power of homeowners at any time is affected by price levels in the dwelling's purchase year, rather than just by those in the current year.

Treatment of Owned Accommodation in the Consumer Price Index

10.8 The treatment of owned accommodation in the CPI does not truly conform to the basic definition of the CPI as a price index associated with a fixed-basket of products purchased by the target population. Moreover, owned accommodation is not treated in the CPI in the same manner as other durable goods. This special treatment is justified by the fact that owner-occupied dwellings have, in general, much longer useful lives, higher values and more complicated terms of payment than other durable goods. Although these differences are of a quantitative rather than of a qualitative nature, they are important enough to be taken into account in the computation of the CPI. For instance, mortgage credit is generally considered to be an integral part of purchasing a home, so it would not be ideal to disregard the effect of changing mortgage interest costs on the overall shelter price index. In addition, since mortgage payments for purchased dwellings are spread over many years, it is desirable to take into account not only their current, but also their previous prices in order to produce an appropriate indicator of price-induced changes in the purchasing power of the consumer dollar. These problems seem to affect other durable goods, including high-value goods such as automobiles, to a lesser extent.

10.9 The treatment of owned accommodation in the CPI follows neither the money outlays approach nor the opportunity cost approach. The owned accommodation index is not a money outlays index because of its replacement cost component, depreciation being an imputed cost rather than an actual expense. The owned accommodation index is not consistent, either, with an opportunity cost approach because it excludes other imputed elements that are generally regarded as part of the opportunity cost, such as forgone interest on invested capital and capital appreciation.

10.10 It follows that the solution to the treatment of owned accommodation is a matter of determining the principal purpose(s) that the CPI is designed to serve. There are several, sometimes competing, uses of the CPI.¹²² As with the rest of the index, the approach taken with respect to owned accommodation must attempt to find balance between the purposes for which it serves. The treatment of owned accommodation in the CPI serves well the purpose of providing an adequate indicator of price-induced changes in the purchasing power of the consumer dollar. In particular, it is meant to measure the impact of price changes on a selection of costs specific to homeowners.

122. The uses of the Consumer Price Index are discussed in Chapter 2.

10.11 The price index for the owned accommodation aggregate class, like those for other CPI classes, is calculated as a weighted average of elementary indices. Each elementary index represents the price movement for a given element of homeowners' costs. These costs relate to the stock of dwellings that is identical or equivalent to the stock actually owned by the target population at the end of the basket reference period. Thus, the indices for owned accommodation measure price-induced changes in the cost of using a fixed stock of dwellings, while, for other CPI classes, they measure price-induced changes in the cost of buying a fixed basket of goods and services. Six homeowners' costs are included as elementary indices under the owned accommodation aggregate class:

- mortgage interest cost
- replacement cost
- property taxes
- homeowners' home and mortgage insurance
- homeowners' maintenance and repairs
- other owned accommodation expenses

10.12 Basket weights for these cost elements, except for replacement cost, have been derived from household expenditures reported in the Survey of Household Spending (SHS) for the basket reference period. The basket weight for replacement cost, considered equal to the annual depreciation of the stock of owner-occupied dwellings, is estimated to be 1.5% of the estimated market value of this stock at the end of 2013.¹²³

10.13 The **mortgage interest cost** index is intended to measure price-induced changes in the amount of mortgage interest owed by the target population. There are two price factors that contribute to these changes through time. First, changes in dwelling prices affect the initial amount of debt; hence they also affect the amount of principal outstanding in subsequent periods. Second, given the amount of principal outstanding, the amount of mortgage interest payments is determined by changes in the price of credit (that is, mortgage interest rates). Consequently, the mortgage interest cost index (with the price observation period t and the price reference period 0) is defined as a product of two indices (10.1).

$$M^{0t} = H^{0t} \times I^{0t} \quad (10.1)$$

Where:

H^{0t} is an index that estimates the effect of changes in dwelling prices on the amount of principal outstanding, assuming a fixed stock of mortgaged dwellings and constant conditions of their financing; and

I^{0t} is an index that estimates the effect of changes in interest rates on the amount of mortgage interest owed, assuming a fixed amount of principal outstanding.

123. The value of land is not included in the Consumer Price Index basket weight for replacement cost. The rationale for using the 1.5% rate can be found in Kostenbauer (2001).

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- 10.14** The index $H^{t_0,t}$ is derived by comparing the average level of dwelling prices in the 25-year interval prior to the price observation period (t) of the index with the average level of dwelling prices in the 25-year interval prior to the price reference period (0).¹²⁴ The procedure is based on the assumption that the dwelling price at the time the debt was initially contracted affects the amount of principal outstanding at any given time. Hence, the total amount of principal currently outstanding for the population of homeowners depends on dwelling prices from all the past periods in which their mortgages were initiated. The index of the effect of dwelling prices reflects this assumption, although with some further qualifications.
- 10.15** Prices from various past periods do not equally affect the current total amount of principal outstanding. Dwelling prices from remote periods normally have less influence than do prices from more recent periods because, in general, the older the mortgage the larger the proportion of debt that has already been paid off. This pattern is evident in the distribution of principal outstanding by mortgage age, derived from household expenditure data estimated in the SHS. The pattern is reflected in the index by using weights inferred from this distribution. They decrease with the age of the mortgage, giving less importance to dwelling prices from earlier periods.
- 10.16** The actual distribution of principal outstanding by mortgage age, however, depends not only on this general rule of decreasing importance, but also on various conditions prevailing in specific past periods such as the price level of dwellings, the volume and quality of the stock of dwellings mortgaged and the conditions of mortgage financing.¹²⁵
- 10.17** The effect of varying price levels is removed by converting the amounts of principal outstanding reported in the basket reference period to the basket reference period price level, whatever the period of mortgage initiation. The resulting figures represent the unpaid portions of the dwelling stock that were initially mortgaged in those past periods, expressed in volume (quantitative) terms. This price-corrected distribution, after further smoothing to remove the effect of other irregular factors, is used as a model to derive weights assigned to mortgages of various ages.¹²⁶

124. The New Housing Price Index is the source of data on dwelling price movements that has been used in the Consumer Price Index since 1970. The index is published in Statistics Canada. *Capital Expenditure Price Statistics*, Catalogue No. 62-007, Quarterly. The prices used for these series are contractors' selling prices for new dwellings (including land), collected from builders in more than twenty cities.

125. To eliminate the effect of irregular and cyclical variations, the weights used in the index are based on a model distribution of principal outstanding by mortgage age, rather than on the basket reference year distribution.

126. Separate models were established for five regions of Canada. They were derived from the actual 2013 distributions of principal outstanding by year of dwelling purchase, assumed to be the same as the year of mortgage initiation. Mortgages older than 25 years were eliminated because their number proved to be very small. Next, the amounts of principal outstanding reported in the 2013 Survey of Household Spending (SHS) as initiated in a given year, were converted from the price level in the mortgage initiation year to that in 2013. This was done by means of the New Housing Price Index series (including land). Then, these constant dollar values were adjusted to a semi-logarithmic function of mortgage age, expressed in years. The function provides a good approximation of the actual 2013 distributions, while eliminating the effects of cyclical and irregular variations. Finally, monthly values were interpolated from the adjusted annual values. They are assigned as weights to the level of dwelling prices from the month that precedes the observed period or the base period of the index by the mortgage age figure in the model.

10.18 Due to this design, the variation of the index $H^{0:t}$ which estimates the effect of changes in dwelling prices is not affected by non-price factors such as changes in the volume and quality of the stock of mortgaged dwellings or in the proportion of debt that is paid off on mortgages of equal age. The index represents a special case of a fixed-basket price index, which may be presented as follows (10.2).¹²⁷

$$H^{0:t} = \frac{\sum_{g=1}^{300} \bar{p}^{t-g} \times q_g}{\sum_{g=1}^{300} q_g} = \frac{\sum_{g=1}^{300} \bar{p}^{t-g} \times q_g}{\frac{\sum_{g=1}^{300} \bar{p}^{0-g} \times q_g}{\sum_{g=1}^{300} q_g}} \quad (10.2)$$

Where:

g is the age of the mortgage debt, between 1 and 300 months (25 years), counted from the time of the initial mortgage contract to the price reference period 0;

\bar{p}^{t-g} and \bar{p}^{0-g} are the average dwelling price levels in periods $t-g$ and $0-g$, respectively, for a stock of dwellings that is equivalent to that with mortgages of age g in the model distribution; and

q_g is the implicit stock of mortgaged portions of dwellings with loans of age g , estimated according to the model distribution and expressed in volume terms.

10.19 The index $I^{0:t}$ is derived from a standardized function of mortgage interest cost, by comparing its values in the price observation period (t) and in the price reference period (0). The function is standardized by assessing the mortgage interest cost with respect to a constant amount of principal outstanding. Due to this property, the function varies only with the effect of interest rates.

10.20 It is assumed that the amount of mortgage interest cost at any given time depends on interest rates at the time when the current mortgage agreement was contracted. Hence, it is only through new and renegotiated mortgage contracts that the current interest rates affect the amount of mortgage interest currently owed by the population of homeowners. The standardized mortgage interest cost function reflects this assumption by simulating the initiation and renegotiation of mortgages.

10.21 The first value of the standardized mortgage cost function was calculated for the basket reference period. It was inferred from data reported by homeowners on principal outstanding at the end of the basket reference year and on interest rates applicable to their mortgages during consecutive months of that year. In addition, the above amounts of principal outstanding at the end of the basket reference year and the standardized amounts of mortgage interest cost inferred for that month were grouped by the expiration month of the mortgage contracts, again as reported in the SHS of the basket reference year.

127. This formula, though, is not strictly followed in the actual index computation. It is replaced in practice by an equivalent procedure comparing (dividing) two weighted averages of dwelling price indices, all of which are on the 2013 index time base, that cover a 25-year interval prior to the observed and base periods of the index.

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- 10.22** For any observed month subsequent to the basket reference year, the standardized mortgage cost function is derived in a recursive way, from figures already established for the preceding month. The initiation and renegotiation of mortgages in the month preceding the observed one are first simulated. The amount of principal outstanding that is assumed to have been entirely paid off¹²⁸ is reintroduced to represent the newly created mortgages. Also, the amount of principal corresponding to contracts that are assumed to have expired is reintroduced to represent the renegotiated mortgages. New mortgage terms¹²⁹ and current interest rates¹³⁰ are then applied to those two amounts of principal outstanding. In this way, the standardized mortgage interest cost for the observed price reference month is estimated on mortgages that are assumed to have been created and renegotiated in the preceding month.
- 10.23** For the remaining mortgages whose contracts are considered to be unchanged, the standardized mortgage interest cost is simply carried over from the preceding month. This completes the estimation of the standardized mortgage interest cost function for the observed month. The standardized mortgage cost function can be presented by the following, recursive formula (10.3).

$$A^t = A_{old}^{t-1} + \sum_{1,3,5} \left[(B_{new}^{t-1} + B_{renew}^{t-1}) \times f_{(1,3,5)} \right] \times r_{1,3,5}^{t-1} \quad (10.3)$$

Where:

A^t is the amount of the standardized mortgage interest cost in the price observation period t , estimated with respect to all mortgages;

A_{old}^{t-1} is the amount of the standardized mortgage interest cost in the period $t-1$, estimated with respect to the mortgages that did not change (not newly initiated or up for renewal);

$(B_{new}^{t-1} + B_{renew}^{t-1})$ is the total amount of principal outstanding in period $t-1$, estimated with respect to the mortgages newly initiated and renewed;

$f_{(1,3,5)}$ is the fraction of principal outstanding that represents contracts with 1,3,5 year terms among newly created and renewed mortgages; and

$r_{1,3,5}^{t-1}$ is the current mortgage interest rate in period $t-1$ for contracts of 1, 3 and 5 year terms.

- 10.24** The **replacement cost** index relates to that portion of owner-occupied dwellings that is assumed to be consumed. This is represented by the worn-out structural portion of housing (depreciation of housing) or the amount a homeowner must spend to maintain the home's market value. The price index for replacement cost is derived by taking the total value of homes owned in Canada at the end of the basket reference year and adjusting the total each month by changes in house prices as reflected by the New Housing Price Index,¹³¹ exclusive of land.

128. It corresponds to the fraction of mortgages one month old in the model distribution of principal outstanding by mortgage age, described above.

129. Three popular mortgage terms of one, three and five years are assigned, following the distribution of the principal outstanding by terms in the 2013 Survey of Household Spending (SHS). The terms are also used to assign the expiration dates to newly created and renegotiated mortgages. Due to this, the standardized cost function and the index of the effect of interest rates can continue beyond the expiration dates reported in the 2013 SHS.

130. Canada Mortgage and Housing Corporation (CMHC) provides data on monthly average interest rates, for mortgages with the terms of one, three and five years.

131. Statistics Canada Survey number [2310](#).

- 10.25** The **property tax index** measures changes through time in the amount of taxes levied on a constant sample of dwellings in selected municipalities. This sample of property taxes paid, obtained from administrative sources, is used to obtain an estimate of the average property tax by city. This enters as the price in the current and previous periods' unit value index calculation.¹³² Changes in property taxes are reflected once a year, in the October CPI.
- 10.26** The **homeowners' home and mortgage insurance index** measures changes through time in the cost of insuring a fixed stock of dwellings against a specified combination of perils. This cost varies not only with changes in insurance rates for given property values, but also with changes in the values of the properties covered which result from movements in dwelling prices. Consequently, the insurance index is estimated by multiplying the following two indices:
- 10.26.1** One that measures the change in the value of the replacement cost of properties using a third-party insurance data base (estimated quarterly); and
 - 10.26.2** One that measures the change in insurance rates by comparing the cost of identical policy profiles using data from insurance companies in the sample.
- 10.27** The elementary indices for Homeowners' maintenance and repairs as well as Other owned accommodation expenses are estimated using the standard approach for calculating elementary price indices.¹³³

Treatment of Seasonal Products

- 10.28** The use of the fixed-basket concept to construct consumer price indices creates difficulties when the actual consumption pattern in the price observation period differs markedly from that of the basket reference period. In the case of monthly indices, problems may arise due to the seasonality of the quantities consumed of many goods and services. Some products are subject to seasonal variations in their supply. These include various services, such as golf memberships or downhill ski lift tickets that are only available for a few months every year. Other products are subject to seasonal variations in demand. These include many articles of clothing, such as bathing suits and winter coats. Whatever the cause, any good or service that experiences seasonal fluctuations in its quantity purchased should be considered a seasonal product.
- 10.29** The CPI is based on a fixed-basket, constructed from consumer expenditure data for one year. The representativeness of an annual fixed-basket index in any one particular month is adversely affected if seasonal products are part of the basket. In a fixed-basket index, a seasonal good or service will have the same quantity weight in the basket for all months of the year. That quantity will be inappropriately small in the product's in-season months and inappropriately large in its off-season months. For example, golf membership will be under-weighted in June's CPI, and over-weighted in December's.
- 10.30** The treatment of seasonal goods and services is a contentious issue. One effective way of dealing with seasonal products in a fixed-basket index with weights from a calendar year is to avoid the inclusion of highly seasonal products in the sample, that is goods or services for which quantity consumed would fall to zero in any particular month(s) of the year. For example, rather than including golf memberships which are unavailable in the winter months, instead the CPI could measure price change of indoor rock climbing passes which are available all year round.

132. The unit value calculation is discussed in Chapter 6.

133. The standard approach for calculating elementary price indices in the Consumer Price Index is discussed in Chapter 6.

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- 10.31** The main problem with this approach is that it may diminish the representativeness of certain indices in certain months. For example, while the CPI aims to measure price change for all in-scope consumer products, it must inevitably be based on a sample of product offers (POs) for a relatively small number of representative products¹³⁴ that are considered to be representative of all goods and services within a particular elementary aggregate. The problem appears if the price movements of the all-year product, such as indoor rock climbing passes, are not representative of the price movements of all products included in the elementary aggregate. This can become particularly problematic in a country with very distinct seasons, such as Canada, where seasonal products may make up a large proportion of consumer spending. Not including the price movements of seasonal items could lead to some elementary price indices being unrepresentative of price change experienced by the target population for that expenditure category.
- 10.32** Another option for dealing with the challenges associated with seasonal products is to have separate fixed-quantity baskets for all months of the calendar year (seasonal baskets). That is, to calculate the January index using only the quantities consumed in January, the February index using only the quantities consumed in February, and so forth. Then a seasonal product would have an appropriate quantity weight in every month's index of the year. Annual indices for seasonal products would be calculated as weighted averages of monthly indices so in-season months would be more heavily weighted than off-season months in calculating the annual price movement. If a good or service was a seasonally disappearing product, it would not be part of the basket in a month when it is not available in the market.
- 10.33** The major disadvantage of an index with seasonal baskets is that it does not provide a measure of pure price change for intra-annual price movements, such as quarterly or monthly changes. First, consider the fixed-basket index with calendar year weights. If the price of every collected PO showed no change in a given month, the index would also show no change. Additionally, if the prices of some collected POs in this fixed-basket index change in a given month, the percentage change of the All-items CPI (or another aggregate index) will lie between the minimum and maximum percentage changes of the corresponding sub-indices. By contrast, if the price of every PO in an index with seasonal baskets showed no price change from month to month, that index may still register an increase or a decrease due to changes in the quantities of the monthly seasonal baskets. Additionally, the monthly percentage change of an All-items CPI (or another aggregate index) with seasonal baskets could sometimes stray outside the minimum and maximum percentage changes of its respective sub-indices.
- 10.34** Finally, the determination of seasonal basket weights, like all basket weights, is based on consumption patterns from periods in the past and consequently would not take into account abnormal seasonal fluctuations in current periods. For instance if bad weather conditions in the current period were to impact certain fruit or vegetable crops thereby delaying their availability in the market, seasonal baskets based on past expenditure periods would not account for this.
- 10.35** The CPI has used two methodologies to deal with seasonal products. From 1961 to April 1973 the CPI series for seasonal food products were based on seasonal-basket formulae.¹³⁵ From April 1973 forward all aggregate price indices are calculated using a fixed-basket Lowe price index formula with calendar year weights. Price movements for highly seasonal products are imputed in their out-of-season periods.

134. The Consumer Price Index price sample is described as small relative to the enormous number of consumer products available. Available resources and other operational and conceptual challenges make it impossible to collect prices for all products bought by Canadian consumers. Furthermore, it is not necessary to sample all products bought by consumers if a representative sample of prices is drawn. The sample strategy for the CPI is discussed in Chapter 5.

135. Statistics Canada (1987).

- 10.36 In the current CPI practice, highly seasonal products are identified as such and in the months when their quantity purchased is believed to approximate zero, their price movements are imputed. Examples of products identified as highly seasonal include gas barbeques, lawn mowers, winter jackets and boats. Out-of-season imputations are done at the level of elementary aggregates. The imputed price movement is taken from the aggregate class that is located above the out-of season product in the CPI classification.
- 10.37 In the months when indices for out-of-seasonal products are imputed, the price movement for the aggregate index would be exactly the same as if the seasonal product were not part of the basket. Essentially, the basket weights of out-of-season goods and services are redistributed among the remaining in-season products so in this respect, out-of-season- imputation, although carried out within the parameters of a fixed-basket index with calendar year weights, gives results similar to the seasonal-basket approach.
- 10.38 Imputing prices for out-of-season products also helps dampen sharp movements in the index that can occur when moving from one season to the next. This is because the price movement of the product is extrapolated over the out-of-season period rather than being treated as posting no price change. The extent to which out-of-season imputations reduce inter-seasonal shifts in the index depends on the correlation between the price movement of the highly seasonal products and the price movement of the aggregate class that is the source of the imputation.
- 10.39 It should be clearly understood that the objective of out-of-season- imputation is not to obtain a proxy index that mirrors the price behavior of the seasonal product in its out-of-season months. In many cases, the true price movements of products in their out-of-season months are quite volatile as they are not subject to predictable changes in supply or demand.

Seasonal Adjustment of Price Indices

- 10.40 Month to month movements in the CPI can sometimes be the result of seasonal price changes. For example, between January and March travel packages typically see price increases as more people tend to travel out of the country in the winter and over the March break. While these price changes are valid, in that consumers often experience higher prices for travel tours in the winter months, they are part of a usual pattern of price increases brought on by raised demand. They are likely to be reversed when demand weakens again. Accordingly, for some purposes these price changes might not be interpreted as consumer price inflation. The practice of seasonal adjustment is used to isolate and then remove seasonal price movements from indices to get a better picture of "true" or "underlying" consumer price inflation in the economy.¹³⁶
- 10.41 Statistics Canada uses the statistical program X12 ARIMA to seasonally adjust the All-items CPI and 12 other aggregate indices at the Canada level.¹³⁷ Each month the current index is seasonally adjusted and at the same time the previous month's seasonally adjusted index is open to revision. Additionally, each January the last 36 months of seasonally adjusted data are reviewed and revised if necessary.

136. While there is no exact definition of "true" or "underlying" price inflation, many economists assert that typical seasonal fluctuations in consumer prices should not be regarded as inflation because when contained within an annual period, they are neutral.

137. The 12 other aggregate price indices seasonally adjusted each month include: the eight major aggregates (Food; Shelter; Household operations, furnishings and equipment; Clothing and footwear; Transportation; Health and personal care; Recreation, education and reading; and Alcoholic beverages and tobacco products); the Core Consumer Price Index (CPI) (Bank of Canada's definition); the All-items CPI excluding eight of the most volatile components (Bank of Canada's definition); the All-items CPI excluding food; and the All-items CPI excluding food and energy.

- 10.42** Statistics Canada does not seasonally adjust every CPI series. The headline CPI figure is an unadjusted estimate. This is due, in part, to the fact that many users consider the year-over-year percentage change in the All-items CPI to be a good general indicator of consumer price inflation. Year-over-year changes, by their very construction, neutralize seasonal movements and do not require seasonal adjustment.
- 10.43** The other reason for the limited production of seasonally adjusted CPI data is the properties of the index aggregation formula (Lowe) used to compile the upper level of the CPI. To counteract the potential for residual seasonality in aggregate indices, Statistics Canada employs a direct or independent seasonal adjustment method, meaning that seasonally adjusted CPI series are not derived from their respective seasonally adjusted sub-indices. While this practice reduces the likelihood of having residual seasonality in the series, it also poses a few challenges when using the seasonally adjusted CPI data. First, direct seasonal adjustment prevents consistency in aggregation. Since the All-items CPI is adjusted independently of the eight major aggregates, its movements can be inconsistent with those of its component indices. Second, by directly seasonally adjusting the All-items CPI and major components, the capacity to analyze or interpret contributions to percentage change is lost.
- 10.44** Despite the challenges with seasonally adjusted price indices, seasonal adjustment provides many useful benefits to users of price indices.¹³⁸

138. Wyman (2010).

Chapter 11 History

- 11.1 The Consumer Price Index (CPI) began with a study conducted by the Department of Labour in the early 1900s. The study was based on a hypothetical family budget that represented weekly expenditures of an urban working man's family of five. Retail prices for 29 food products and 5 fuel and lighting products were collected in approximately 60 cities. In addition, information was obtained on the rent for a representative workingman's six-roomed dwelling. Using these data, indices on a 1900 index base period were calculated for Canada and the provinces. The calculation of these indices continued until August 1940.
- 11.2 The Department of Labour also started producing a "Cost-of-Living Index"¹³⁹ on a 1913 index base period, with component indices for food, fuel and lighting, rent, clothing and sundries. This index was published for June and December from 1914 to 1917, for April, June, September and December from 1918 to 1926 and monthly from 1927 onward. An attempt was made to weight product classes according to their actual importance in wage-earners' spending, even though no extensive household expenditure survey had been undertaken.
- 11.3 The first index of retail prices produced by the Dominion Bureau of Statistics also had a 1913 index base period. This index was calculated using prices from the Department of Labour series as well as some prices obtained directly from retailers. Basket weights used in the index were based on estimates of the total Canadian consumption of each product in 1913. The index was subsequently updated and produced on a 1926 index base period. Although the weighting system of the updated index was more refined, it was still based on the estimated total consumption in Canada. The number of product prices collected increased substantially at this time.
- 11.4 The index was again updated in 1940 and published on a 1935-39 index base period. The basket weights used in this index were derived from a 1938 Family Expenditure Survey (FAMEX) for urban wage-earner families with annual incomes between \$450 and \$2,500. The 1940 update showed that the Bureau had come to accept the Department of Labour's view that the index should measure price changes experienced by a well-defined demographic group.
- 11.5 Until 1940 the CPI was a direct Laspeyres¹⁴⁰ index for its entire or more recent estimation period. Any index can be calculated as a Laspeyres index when it is initiated and until the 1947-48 basket update in 1949, it was considered acceptable to revise the CPI backward for several years at the time of a basket update.¹⁴¹
- 11.6 A subsequent FAMEX covering the period 1947-48 provided the basis for the next thorough basket update of the index in 1952. At that time, 1949 became the index base period and the title was changed from "Cost-of-Living Index" to "Consumer Price Index (CPI)".¹⁴² The CPI was defined as "a measure of the percentage change through time in the cost of purchasing a fixed basket of goods and services representing the consumption of a particular population group during a given period of time". This definition remains in essence unaltered to this day.

139. Despite the original name, "Cost-of-living-index", the concepts and methodologies used to construct the index never truly conformed to the cost-of-living framework as understood today. Even under its original name, the index was closely tied to the concept of measuring a fixed basket of goods and services bought by a target population.

140. The index compared prices in a current period t the price reference period 0 , directly rather than via chained-monthly indices as the index is computed today. The methods for computing the Consumer Price Index are discussed in Chapter 6.

141. This past practice of revising backward at the time of a basket update is contrary to the current no revision policy. The adoption of a no revision policy highlighted the importance of the Consumer Price Index as a tool in adjusting wages and/or other contractual payments.

142. The original title was inadequate because it led users to believe that the Consumer Price Index was a measure of all changes in living costs which the index was never designed to do.

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- 11.7** Soon after that update, a series of small-scale biennial surveys of family expenditures were undertaken and their results were used to choose the dates of subsequent CPI basket updates. The changes in family expenditure patterns shown by the 1957, 1967 and 1974 surveys were deemed sufficiently important to justify the implementation of new baskets in January 1961, May 1973 and October 1978, respectively.
- 11.8** Several important changes were introduced with the 1974 basket. In particular, family size and income constraints were removed, thus broadening the target population. Also, with the updating of the 1974 basket the national indices began to be calculated as weighted averages of the corresponding indices for 59 urban centres. In addition, the New Housing Price Index replaced the Residential Building Construction Input Price Index in the CPI series measuring homeowners' replacement cost, mortgage interest cost and homeowners' home and mortgage insurance.
- 11.9** Following the adoption of the 1974 basket in the CPI, a policy of regular updating was established, with the updates tied to a four-year cycle of major FAMEX surveys. The 1978 basket was thus incorporated in April 1982, the 1982 basket in January 1985, and the 1986 basket in January 1989. The time lag between the basket reference period and the implementation of the basket was gradually reduced.
- 11.10** There was a six-year interval between the 1986 and the 1992 baskets, longer than the regular four-year interval. The introduction of the 1992 basket was postponed by two years to ensure it would reflect adjustments to consumption patterns resulting from the introduction of the Goods and Services Tax (GST) and from the removal of the Federal Sales Tax in January 1991. However, the time lag between the basket reference year and basket implementation remained 24 months for the 1992 basket, which was implemented with the January 1995 update.
- 11.11** The 1996 basket was introduced with the January 1998 update and was the last basket update that was based on FAMEX data as the survey was subsequently discontinued. The three-year lag between the introduction of the 1996 basket and the introduction of the previous basket was at the time a record for the CPI.
- 11.12** There was a five-year lag between the 1996 and 2001 baskets, although the basket was introduced with the January 2003 update, matching the record of the 1996 basket update's record for the shortest lag between the end of the basket reference year and the month of implementation. The FAMEX survey was replaced in 1997 with an annual Survey of Household Spending (SHS). Starting with 1999, the SHS estimates were calculated for the provinces and territories in odd-numbered years and for the provinces only in even-numbered years. Since the CPI includes the territorial capitals Yellowknife, Whitehorse and Iqaluit as geographical strata, the year 2000 was precluded as a basket reference year. Budget problems and concerns about year 2000 bugs in computer software also contributed to the choice of 2001 for the basket update.
- 11.13** The 2005 and 2009 basket updates marked a return to a four year interval between baskets but also a lengthening in the implementation lag: the baskets were implemented in May 2007 and May 2011 respectively.
- 11.14** The 2011 basket marked the first-ever two-year interval between basket updates for the CPI. It also marked a reduction in the implementation lag to 14 months after the basket reference period, since the new basket was introduced in March 2013.

- 11.15** Whenever a basket update takes place, the concepts and the procedures used to calculate the CPI are reviewed and revised when necessary. The CPI index base period has also been periodically changed. While not required to be implemented at the time of a basket update, for operational reasons many of the changes to the CPI index base period have taken place alongside the updating of the basket of goods and services. Changes to the index base period have usually related to changes in the base year of the Canadian System of National Accounts.
- 11.16** A detailed chronological history of all the basket updates for the CPI can be found in Appendix C. It includes the basket reference period; the basket link month; the basket end month; the first month published with the new basket; any major revisions made at the time of the basket update; changes to the target population and/or geographical coverage; the introduction of new products into the basket or sample; as well as notable changes that were made to the classifications, scope or methodologies.

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Glossary

The glossary contains terms that are pertinent to price index theory and the construction of the Canadian Consumer Price Index (CPI). The section referred to in the third column is where the given term is used and explained in a broader context.

Term	Description	Section
Acceleration	A larger (faster) rate of change of an index from one period to another. The opposite of deceleration.	2.22
Acquisitions approach	An approach to the timing of price collection corresponding to the period in which the good or service is obtained by the consumer, that is, when the legal ownership of the good passes to the consumer.	3.26-3.29
All-items CPI	The total (highest-level aggregate) in the CPI product classification. The index which is commonly used to calculate "inflation".	2.1
Annual average price indexes	The unweighted arithmetic average of 12 consecutive monthly price indexes from January to December.	2.2
Annual average percentage change	The percentage difference between two consecutive annual average prices indexes.	2.14.3
Asset	An economic resource. Anything capable of being owned or controlled to produce value and that is held to have positive economic value.	3.13
Asymmetrically weighted	Refers to a price index formula where the weights used to aggregate elementary price indexes do not give equal weight to both periods of price comparison. For this reason an asymmetrically weighted price index formula does not represent the spending patterns of consumers over both periods of price comparison and is therefore subject to substitution bias. The Laspeyres, Lowe and Paasche formulae are asymmetrically weighted price indexes.	9.22
Basic class (aggregate)	The lowest level in the intersection of the product and geography classifications at which the quantity weights are kept fixed for the duration of the basket. This is also the lowest level in which indexes are typically published for the CPI.	4.9
Basket update	The process of replacing a basket (fixed-quantity weights) by another one that is more recent.	8.6 8.10-8.12
Basket weight	Expenditures from a given reference period used to estimate quantities consumed for upper level aggregation of elementary price indexes.	8.1-8.6
Bestsellers method	A common method for estimating price change for goods that are highly 'fashionable' and have high intangible content that consumers value. The price estimation method currently used for the Books and other printed matter (excluding textbooks) elementary index in the CPI.	1.18 5.30
Bias	Errors which are systematic, meaning they lead to persistent over-or under-estimation of the phenomenon being measured.	9.2

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Term	Description	Section
Capital good	A durable good that is also an asset.	1.51, 10.2
Chain-linked index	An index spanning more than one basket that has been calculated using the chain-linking procedure.	8.21
Chain-linking	The process of chaining a fixed-basket index to another fixed-basket index in order to create a continuous time series. This process ensures that period-over-period percentage changes in a chain-linked index will only reflect price change and not changes in the fixed quantities.	8.14-8.21
Classification	An exhaustive and mutually exclusive structure for categorizing a domain. In the CPI, classifications are used primarily for the product and geography domains. They are used for weighting and aggregating elementary prices indexes and also serve as a basis for stratifying the sample of prices collected.	1.12 4.1-4.9
Collection area	A geographical sampling unit. For the CPI it corresponds to a Census Sub-Division and is similar to a "municipality".	5.6
Composite price index	An index designed to express, in one number, average price change for multiple products and/or geographies.	2.11, 8.23
Computer-Assisted Personal Interview (CAPI)	A survey approach where interviewers ask questions guided by a computer screen and enter the responses into the computer, where those answers are checked for consistency and from which the encrypted responses are ultimately transmitted to headquarters.	1.21, 5.14
Consumer goods and services	Products purchased for consumption by a household.	10.4
Contributions to percentage change	The percentage points that a change in a component index account for in the percentage change of an aggregate index. It is a tool used by Statistics Canada to understand and summarize movements in the CPI.	2.17-2.23
Cost-of-Living Index (COLI)	An index designed to measure changes in the cost of maintaining a given level of well-being for a group of consumers.	2.30.2
CPI survey frame	A set of units from which a CPI sample is drawn.	5.7-5.11
Cut-off sampling	A survey sampling method in which parts of the universe are excluded from sample selection. The method is used by Statistics Canada in the sampling of prices for various elementary aggregates where only partial frames are available.	5.2-5.26
Deceleration	A smaller (slower) rate of change of an index from one period to another. The opposite of acceleration.	2.22
Direct price comparison	A method used to compare the prices of exiting and entering Product Offers (POs) in the CPI sample when there is no perceptible quality difference. The price of the entering PO is compared directly with the price of the exiting PO and no quality adjustment is made.	7.4-7.6
Durable good	A good that is not fully consumed in a short period of time (roughly one year). It provides services over a long period of time.	3.13

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Term	Description	Section
Economic Region	A standard geographical unit, defined by Statistics Canada, for analysis of regional economic activity which corresponds to a grouping of Census Divisions.	4.3
Eight major aggregates (components)	The highest level of aggregation in the product classification of the CPI below the All-items level.	4.2
Elementary aggregates	The lowest level in the intersection of the product and geographical classifications of the CPI for which expenditure weights are normally available. They consist of similar groupings of products in a geographical stratum. They are the starting point of the upper level aggregation using the fixed-basket Lowe formula.	4.4-4.11
Elementary price indexes	Price indexes corresponding to elementary aggregates. In the CPI they are typically calculated using a Jevons formula.	6.13
Explicit quality adjustment	Various methods of directly adjusting an observed price to account for the estimated quality difference between exiting and entering Product Offers in the CPI sample.	7.7 7.12- 7.13
Fixed-basket index	The ratio of the cost of a specified basket of goods and services in an price observation period to its cost in a previous period. The Dutot, Lowe, Laspeyres, Paasche, Marshall-Edgeworth and Walsh formulae yield fixed-basket price indexes.	2.30.2 6.5 10.30
Geographical stratum	The lowest geographical level in which expenditure weights are used in the construction of the CPI. The geographical strata also serve as sampling areas within which Product Offers are collected for the CPI.	4.3 5.24 6.2
Hedonic quality adjustment	A statistical method for estimating how the price of a Product Offer (PO) is affected by its characteristics. It is a common method used to estimate the effect of quality change on price movement at the time of PO substitution.	7.14
Hybrid expenditures	The value corresponding to the hypothetical cost of an elementary aggregate, in which quantities and prices are derived from different periods. The quantities normally come from the basket reference period and the prices from another period.	6.27 8.1
Imputation	The process of replacing missing data with estimated values. In terms of the CPI it involves estimating the price movement of an elementary aggregate by proxy, using the price movement of a donor class.	5.3 7.8
Index reference period (index base period)	The period in which an index is arbitrarily set equal to 100.	2.11 8.20-8.28
Link month	The month in which a new fixed-basket index is chained to an old fixed-basket index.	8.14-8.20
Link-to-show-no-change	A method which forces a price relative of 1 (no price change) when a new (entering) Product Offer (PO) replaces an old (exiting) PO in the CPI sample.	7.9

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Term	Description	Section
Lower level of calculation	The first stage of CPI calculation, which involves computing price indexes for elementary aggregates. In the case of the CPI this is typically done using a ratio of geometric average prices (Jevons).	6.2
Matched-model	A method for measuring "pure price change" by keeping constant all quality characteristics across time, except for price. This is the standard method for measuring price change in elementary aggregates in the CPI.	6.9 7.1
Money outlays	A variant of the user-cost approach for measuring owned accommodation in a CPI where only expenses involving actual cash disbursements are included.	10.5 10.9
Month-over-month percentage changes	A price change between one month t and the preceding month $t-1$.	2.13.1
Outlet	The interface between a supplier of products and the consumer. It may be a store, a catalogue, a website etc.	5.1-5.15
Overlap pricing	A method of quality adjustment based on the difference in price between exiting and entering Product Offers (POs) when both can be observed simultaneously.	7.7
Plutocratic weights	Expenditure weights in which each household in the target population contributes its own spending to the total spending weight for the target population. The basket weights for the CPI, which are derived primarily from the Survey of Household Spending, follow this approach. Opposite of democratic weights.	8.2
Price observation period	One of the periods for which an index has been compiled. Also widely used to mean the later of the two periods being compared. Appears in the numerator of price ratios. It is typically designated as period t .	2.5
Price reference period	The period that provides the prices to which all other periods are compared. Appears in the denominator of price ratios. It is typically designated as period 0.	6.24-6.32
Price-updating	A procedure whereby the quantities of an earlier period are revalued at the prices of a later period. The result is hybrid expenditure weights. This procedure is necessary in order to hold quantities constant when expenditures (not quantities) are the only source of data available for deriving basket weights.	6.28 8.15
Product Offer (PO)	The presentation of a particular good or service, with an associated price, by a retailer to a purchaser. Used in the CPI as a proxy for the final transaction price paid by consumers.	3.24 5.14
Profiles method	A method for estimating price change for an elementary aggregate where prices for bundles of services (rather than individual products) are compared over time.	5.27 5.29
Pure price change	The change in the price of a product of which the characteristics are unchanged; or the change in the price after adjusting for any change in quality.	7.1-7.2

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Term	Description	Section
Quality adjustment	An adjustment to remove from the observed price change the contribution attributable to changes in a product's characteristics.	1.30 5.21
Rebasing	The process of changing the index reference (base) period. As an arithmetic operation it does not affect the rate of price change between any two index points.	2.12 8.25
Rental equivalence	The estimation of the hypothetical rents that would be payable by owner-occupiers on the basis of market rents payable for renter-occupied accommodation of the same type and location.	10.4
Representative Product (RP)	The definition of a narrow class of products for which the average price change is expected to be representative of the average price change of an elementary aggregate.	1.15 5.4
Sample	A set of data collected to represent a population.	5.1
Sampling unit	An element considered for selection in some stage of survey	5.4
Scope	The set of products and geographies and the target population for which the CPI is intended to measure price changes.	1.7 3.1
Seasonal adjustment	A procedure for removing regular recurring intra-annual fluctuations from a time series in order to reveal its underlying trend, cyclical and irregular movements.	10.40-10.44
Seasonal product	Products that are either not available for purchase during certain periods of the year or are available but subject to regular and significant fluctuations in the quantities available and/or purchased.	10.28
Special aggregate index	An index for different combinations of elementary price indexes, excluding certain product classes. These indexes provide supplementary information on aggregate price change.	2.14
Substitution bias	Generally understood to be the bias that arises from the use of asymmetrically weighted fixed-basket index formulae. Occurs because quantities are held constant while consumers change their purchasing patterns in response to relative price changes.	9.20-9.26
Symmetrically weighted	Refers to a price index formula where the weights used to aggregate elementary price indexes refer to both periods of price comparison. For this reason a symmetrically weighted price index formula represents the spending patterns of consumers over both periods of price comparison and is therefore not subject to substitution bias. The Fisher, Törnqvist-Theil, Walsh and Marshall-Edgeworth formulae are examples of symmetrically weighted price indexes.	9.23-9.26
Target population	The people or group of people whose consumption expenditures are in the scope of the CPI.	3.5
Target Product Offer (TPO)	The specification of a Representative Product (RP) to an outlet. The TPO acts as the sample intention for the CPI.	5.13

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Term	Description	Section
Unit value index	A method for estimating price change for an elementary aggregate where the quantity-weighted average transaction price for homogenous products is compared over time.	6.20
Upper level calculation	The second stage of CPI calculation, which involves aggregating elementary price indexes using a fixed-quantity weighted arithmetic average formula (Lowe).	1.24
User cost	The estimation of the cost of using a fixed asset or durable good. The current approach used in the CPI for owned accommodation.	10.5
Weight (basket) reference period	The period from which the expenditures, used to derive the quantity weights of the CPI basket, are taken.	6.25
Weight adjustment	A procedure to obtain monthly hybrid expenditure weights when annual expenditures are used in the calculation of monthly price indexes.	8.16

Source: Statistics Canada, Consumer Prices Division.

Appendix A Common Price Index Formulae

Common index formulae for elementary price indices (lower level)		
Name	Index formulae	Description
Dutot	$I_{D,a}^{t-1:t} = \frac{\sum_{i=1}^n \frac{1}{n} p_i^t}{\sum_{i=1}^n \frac{1}{n} p_i^{t-1}}$	A price index defined as the ratio of the unweighted arithmetic average of the prices in the current period t to the unweighted arithmetic average of the prices in period $t-1$. See chapter 6, formula 6.3.
Jevons	$I_{J,a}^{t-1:t} = \frac{\prod_{i=1}^n (p_i^t)^{1/n}}{\prod_{i=1}^n (p_i^{t-1})^{1/n}}$	A price index defined as the ratio of the unweighted geometric average of the prices in the current period t to the unweighted geometric average of the prices in period $t-1$. See chapter 6, formula 6.2.
Weighted Jevons	$I_{WJ,a}^{t-1:t} = \frac{\prod_{i=1}^n (p_i^t)^{w_i / \sum_{i=1}^n w_i}}{\prod_{i=1}^n (p_i^{t-1})^{w_i / \sum_{i=1}^n w_i}}$	A price index defined as the ratio of the explicitly weighted geometric average of the prices in the current period t to the explicitly weighted geometric average of the prices in period $t-1$. See chapter 6, formula 6.4.

Appendix A Common Price Index Formulae

Common index formulae for aggregate price indices (upper level)		
Name	Index formulae	Description
Fisher	$I_{F,A}^{0:t} = \left(I_{L,A}^{0:t} \times I_{P,A}^{0:t} \right)^{\frac{1}{2}}$	A price index defined as a geometric average of the Laspeyres price index and the Paasche price index. It is a symmetrically weighted index using quantities of goods and services from both periods 0 and t .
Laspeyres	$I_{L,A}^{0:t} = \frac{\sum_{i=1}^n p_i^t q_i^0}{\sum_{i=1}^n p_i^0 q_i^0}$	A price index defined as an asymmetrically weighted fixed-basket that uses the quantities of goods and services from the base period 0. See chapter 6, formula 6.5.
Lowe	$I_{Lo,A}^{0:t} = \frac{\sum_{i=1}^n p_i^t q_i^b}{\sum_{i=1}^n p_i^0 q_i^b}$	A price index defined as an asymmetrically weighted fixed-basket that uses the quantities of goods and services from the chosen weight reference period b . See chapter 6, formula 6.6.
Marshall-Edgeworth	$I_{ME,A}^{0:t} = \frac{\sum_{i=1}^n p_i^t \times \left[\frac{(q_i^0 + q_i^t)}{2} \right]}{\sum_{i=1}^n p_i^0 \times \left[\frac{(q_i^0 + q_i^t)}{2} \right]}$	A price index defined as the ratio of average weighted prices between period 0 and t with weights as the arithmetic average of quantities from both periods 0 and t . It is a symmetrically weighted fixed-basket index.
Paasche	$I_{P,A}^{0:t} = \frac{\sum_{i=1}^n p_i^t q_i^t}{\sum_{i=1}^n p_i^0 q_i^t}$	A price index defined as an asymmetrically weighted fixed-basket index that uses the quantities of goods and services from the current period t .
Törnqvist-Theil	$I_{T,A}^{0:t} = \prod_{i=1}^n \left(\frac{p_i^t}{p_i^0} \right)^{\frac{1}{2}(s_i^0 + s_i^t)}$ <p>Where</p> $s_i^0 \equiv \frac{p_i^0 q_i^0}{\sum_{i=1}^n p_i^0 q_i^0}$ $s_i^t \equiv \frac{p_i^t q_i^t}{\sum_{i=1}^n p_i^t q_i^t}$	A price index defined as a geometric average of price relatives weighted by the average expenditure shares in both periods 0 and t . It is a symmetrically weighted index.
Walsh	$I_{W,A}^{0:t} = \frac{\sum_{i=1}^n p_i^t \sqrt{q_i^t q_i^0}}{\sum_{i=1}^n p_i^0 \sqrt{q_i^t q_i^0}}$	A price index defined as the ratio of average weighted prices between period 0 and t with weights as the geometric average of quantities from both periods 0 and t . It is a symmetrically weighted fixed-basket index.

Source: Statistics Canada, Consumer Prices Division.

Appendix B Detailed Calculation Features of Basic Class Indices

Basic class name	% of basket weight	Number of elementary aggregates	Number of representative products	Sample size (Canada Level)	Collection frequency (months per year)	% of prices quality adjusted	Quality adjustment method	Formula / methodology
Food								
Fresh or frozen beef	0.59%	7	6	1,596	12	2.6%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Fresh or frozen pork	0.26%	3	2	535	12	1.2%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Other fresh or frozen meat (excluding poultry)	0.07%	3	3	673	12	6.7%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Fresh or frozen chicken	0.47%	1	3	823	12	3.6%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Other fresh or frozen poultry	0.06%	1	1	266	12	5.9%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Ham and bacon	0.11%	2	2	539	12	1.8%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Other processed meat	0.72%	5	6	1,565	12	0.7%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Fresh or frozen fish (including portions and fish sticks)	0.26%	5	8	1,907	12	2.3%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Canned and other preserved fish	0.05%	3	5	1,273	12	1.1%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Seafood and other marine products	0.14%	3	4	782	12	2.8%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Fresh milk	0.42%	6	6	1,509	12	0.0%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Butter	0.07%	1	2	528	12	0.2%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Cheese	0.54%	6	7	1,869	12	0.8%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Ice cream and related products	0.11%	1	2	531	12	1.5%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Other dairy products	0.41%	5	3	798	12	0.3%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Eggs	0.15%	1	2	535	12	0.3%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Bread, rolls and buns	0.53%	1	5	1,320	12	0.3%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Cookies and crackers	0.23%	2	4	1,045	12	0.5%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Other bakery products	0.34%	1	2	521	12	2.0%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Rice and rice-based mixes	0.07%	1	1	264	12	0.3%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Breakfast cereal and other cereal products (excluding baby food)	0.40%	1	7	1,796	12	0.5%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Pasta products	0.11%	3	4	1,031	12	0.7%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Flour and flour-based mixes	0.04%	1	2	519	12	0.2%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Apples	0.12%	1	2	538	12	0.0%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Oranges	0.12%	1	1	287	12	0.1%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Bananas	0.11%	1	1	266	12	0.0%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Other fresh fruit	0.55%	10	5	1,465	12	0.0%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Fruit juices	0.20%	3	4	1,029	12	0.4%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Other preserved fruit and fruit preparations	0.12%	4	7	1,815	12	0.4%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Nuts	0.15%	1	1	264	12	0.5%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Potatoes	0.06%	1	1	268	12	0.0%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Tomatoes	0.16%	1	1	266	12	0.0%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Lettuce	0.08%	1	4	1,100	12	0.3%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Other fresh vegetables	0.73%	14	13	4,111	12	0.1%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Frozen and dried vegetables	0.08%	3	5	1,227	12	0.7%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Canned vegetables and other vegetable preparations	0.23%	8	10	2,564	12	0.4%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index

Appendix B Detailed Calculation Features of Basic Class Indices

Basic class name	% of basket weight	Number of elementary aggregates	Number of representative products	Sample size (Canada Level)	Collection frequency (months per year)	% of prices quality adjusted	Quality adjustment method	Formula / methodology
Food								
Sugar and syrup	0.08%	1	1	262	12	0.0%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Confectionery	0.39%	1	2	660	12	0.2%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Margarine	0.05%	1	2	525	12	0.5%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Other edible fats and oils	0.08%	1	2	524	12	0.5%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Coffee	0.19%	2	2	527	12	1.5%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Tea	0.06%	1	1	262	12	0.4%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Condiments, spices and vinegars	0.38%	5	6	1,565	12	0.4%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Soup	0.11%	1	1	256	12	0.2%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Baby foods	0.07%	3	2	696	12	0.8%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Pre-cooked frozen food preparations	0.32%	2	6	1,581	12	1.4%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
All other food preparations	0.53%	7	7	1,941	12	0.0%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Non-alcoholic beverages	0.48%	3	3	1,197	12	0.4%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Food purchased from table-service restaurants	2.84%	1	8	437	6	5.3%	Quantity adjustment + Overall mean imputation Expert judgement	Equi-w eighted Jevons index
Food purchased from fast food and take-out restaurants	1.21%	1	7	241	6	1.8%	Quantity adjustment + Overall mean imputation Expert judgement	Equi-w eighted Jevons index
Food purchased from cafeterias and other restaurants	0.74%	1	0	N/A	N/A	N/A	N/A - Estimated by proxy	Equi-w eighted Jevons index
Sub-total	16.4%	143	192					

Appendix B Detailed Calculation Features of Basic Class Indices

Basic class name	% of basket weight	Number of elementary aggregates	Number of representative products	Sample size (Canada Level)	Collection frequency (months per year)	% of prices quality adjusted	Quality adjustment method	Formula / methodology
Rent	5.70%	1	1	Renters in Labour Force Survey: 11,200	12	0.0%	Expert judgement	Dutot index
Tenants' insurance premiums	0.08%	1	1	31	12	0.0%	None	Equi-w eighted Jevons index
Tenants' maintenance, repairs and other expenses	0.06%	1	0	N/A	N/A	0.0%	N/A - Estimated by proxy	N/A - Estimated by proxy
Mortgage interest cost	4.10%	1	1	18 interest rates, 800 houses	12	N/A	None	Special calculation, see Chapter 9
Homeowners' replacement cost	4.55%	1	0	800 houses	3 to 12	N/A	None	Special calculation, see Chapter 9
Property taxes and other special charges	3.46%	1	5	160	1	0.0%	None	Unit value index of average property taxes in cities, obtained through sampling of houses within cities (see Chapter 6)
Homeowners' home and mortgage insurance	1.42%	2	1	Industry database: 68,000	1	0.0%	None	Laspeyres-type/Profiles method
Homeowners' maintenance and repairs	1.28%	27	7	351	3 to 12	0.9%	Expert judgement	Equi-w eighted Jevons index
Other owned accommodation expenses	1.60%	4	1	22	N/A	0.0%	None	Equi-w eighted Jevons index
Electricity	2.50%	1	1	13	1 to 12	0.0%	None	Explicitly w eighted Jevons index
Water	0.69%	1	2	37	2 to 6	0.0%	None	Explicitly w eighted Jevons index
Natural gas	1.08%	1	1	11	2 to 4	0.0%	None	Explicitly w eighted Jevons index
Fuel oil and other fuels	0.30%	1	1	106	6 to 12	0.3%	None	Equi-w eighted Jevons index
Sub-total	26.8%	43	22					

Appendix B Detailed Calculation Features of Basic Class Indices

Basic class name	% of basket weight	Number of elementary aggregates	Number of representative products	Sample size (Canada Level)	Collection frequency (months per year)	% of prices quality adjusted	Quality adjustment method	Formula / methodology
Household operations, furnishings and equipment								
Telephone services	2.55%	6	5	84	2	0.0%	None-profiles method	Explicitly weighted Jevons Index
Postal and other communications services	0.10%	2	1	18	12	0.0%	None-profiles method	Explicitly weighted Jevons Index
Internet access services	0.96%	3	2	18	12	0.0%	None-profiles method	Explicitly weighted Jevons Index
Telephone equipment	0.06%	1	1	79	12	6.1%	Overall mean imputation	Equi-weighted Jevons Index
Child care services	0.86%	2	1	63	2	2.4%	Expert judgement	Equi-weighted Jevons Index
Housekeeping services	0.33%	2	2	58	2	1.4%	Expert judgement	Equi-weighted Jevons Index
Detergents and soaps (other than personal care)	0.17%	2	6	1,588	12	1.8%	Quantity adjustment + Overall mean imputation	Equi-weighted Jevons Index
Other household cleaning products	0.19%	3	10	1,527	12	1.1%	Quantity adjustment + Overall mean imputation	Equi-weighted Jevons Index
Paper supplies	0.45%	2	9	2,239	12	1.0%	Quantity adjustment + Overall mean imputation	Equi-weighted Jevons Index
Plastic and aluminum foil supplies	0.10%	2	6	1,639	12	0.3%	Quantity adjustment + Overall mean imputation	Equi-weighted Jevons Index
Pet food and supplies	0.89%	1	3	1,235	12	3.1%	Quantity adjustment + Overall mean imputation	Equi-weighted Jevons Index
Seeds, plants and cut flowers	0.41%	2	9	148	3 to 4	13.6%	Quantity adjustment + Overall mean imputation	Equi-weighted Jevons Index
Other horticultural goods	0.10%	1	1	66	2	5.9%	Quantity adjustment + Overall mean imputation	Equi-weighted Jevons Index
Other household supplies	0.21%	1	3	242	4	4.5%	Quantity adjustment + Overall mean imputation	Equi-weighted Jevons Index
Other household services	1.62%	9	3	257	1	0.0%	Expert judgement	Equi-weighted Jevons Index
Financial services	0.99%	4	10	70	12	8.8%	Profiles method	Explicitly weighted Jevons Index
Upholstered furniture	0.44%	1	3	111	6	13.3%	Overall mean imputation	Equi-weighted Jevons Index
Wooden furniture	0.27%	3	4	106	6	12.8%	Overall mean imputation	Equi-weighted Jevons Index
Other furniture	0.09%	3	5	144	6	2.0%	Overall mean imputation	Equi-weighted Jevons Index
Window coverings	0.15%	2	3	132	6	3.8%	Overall mean imputation	Equi-weighted Jevons Index
Bedding and other household textiles	0.05%	3	6	390	12	N/A	N/A - Estimated by proxy	Equi-weighted Jevons Index
Area rugs and mats	0.16%	1	1	N/A	N/A	7.6%	Hedonic adjustment	N/A - Estimated by proxy
Cooking appliances	0.13%	3	3	167	6	8.4%	Hedonic adjustment	Equi-weighted Jevons Index
Refrigerators and freezers	0.20%	2	3	178	6	5.9%	Hedonic adjustment	Equi-weighted Jevons Index
Laundry and dishwashing appliances	0.31%	1	3	186	6	8.4%	Hedonic adjustment	Equi-weighted Jevons Index
Other household appliances	0.20%	2	4	194	6	3.7%	Overall mean imputation	Equi-weighted Jevons Index
Non-electric kitchen utensils, tableware and cookware	0.42%	6	10	349	6	4.1%	Overall mean imputation	Equi-weighted Jevons Index
Household tools (including lawn, garden and snow removal equipment)	0.32%	5	7	310	6	N/A	N/A - Estimated by proxy	Equi-weighted Jevons Index
Other household equipment	0.26%	1	0	N/A	N/A	4.8%	Expert judgement	N/A - Estimated by proxy
Services related to household furnishings and equipment	0.13%	2	1	17	3	N/A	N/A - Estimated by proxy	Equi-weighted Jevons Index
Other household furnishings and equipment		1	0	N/A	N/A			
Sub-total	13.1%	79	125					

Appendix B Detailed Calculation Features of Basic Class Indices

Basic class name	% of basket weight**	Number of elementary aggregates**	Number of representative products	Sample size (Canada Level)**	Collection frequency (months per year)	% of prices quality adjusted***	Quality adjustment method	Formula / methodology
Clothing and footwear								
Women's clothing	2.11%	44	46	1,904	3 to 12	5.7%	Expert judgement	Equi-w eighted Jevons index
Men's clothing	1.25%	28	42	1,869	3 to 12	6.9%	Expert judgement	Equi-w eighted Jevons index
Children's clothing	0.48%	29	55	1,583	3 to 12	12.3%	Expert judgement	Equi-w eighted Jevons index
Women's footwear (excluding athletic)	0.45%	7	15	430	3 to 12	9.6%	Expert judgement	Equi-w eighted Jevons index
Men's footwear (excluding athletic)	0.22%	7	15	453	3 to 12	5.3%	Expert judgement	Equi-w eighted Jevons index
Children's footwear (excluding athletic)	0.09%	5	10	247	3 to 12	12.4%	Expert judgement	Equi-w eighted Jevons index
Athletic footwear	0.47%	10	5	381	12	7.9%	Expert judgement	Equi-w eighted Jevons index
Leather clothing accessories	0.12%	4	5	373	12	2.2%	Expert judgement	Equi-w eighted Jevons index
Other clothing accessories	0.18%	4	3	57	12	7.4%	Expert judgement	Equi-w eighted Jevons index
Watches	0.09%	3	3	79	4	8.3%	Expert judgement	Equi-w eighted Jevons index
Jewellery	0.35%	2	4	74	4	9.6%	Expert judgement	Equi-w eighted Jevons index
Clothing material and notions	0.06%	3	5	117	4	0.6%	Expert judgement	Equi-w eighted Jevons index
Laundry services	0.08%	1	2	51	4	0.0%	Expert judgement	Equi-w eighted Jevons index
Dry cleaning services	0.09%	1	2	44	4	0.6%	Expert judgement	Equi-w eighted Jevons index
Other clothing services	0.03%	2	2	40	4	0.0%	Expert judgement	Equi-w eighted Jevons index
sub-total	6.1%	150	216					
Transportation								
Purchase of passenger vehicles	6.70%	65	65	114	3	22.2%	Opinion cost method	Equi-w eighted Jevons index
Leasing of passenger vehicles	0.80%	1	0	N/A	N/A	N/A	N/A - Estimated by Proxy	N/A - Estimated by Proxy
Rental of passenger vehicles	0.09%	1	1	35	4	2.9%	Expert judgement	Equi-w eighted Jevons index
Gasoline	3.84%	2	5	1,612	12	0.0%	None	Equi-w eighted Jevons index
Passenger vehicle parts, accessories and supplies	0.70%	5	9	456	2	3.8%	Overall mean imputation or Expert judgement	Equi-w eighted Jevons index
Passenger vehicle maintenance and repair services	1.18%	3	8	542	2	6.4%	Overall mean imputation or Expert judgement	Equi-w eighted Jevons index
Passenger vehicle insurance premiums	2.89%	1	1	Industry database: 219,400	12	0.0%	None	Laspeyres - type, profiles method
Passenger vehicle registration fees	0.28%	1	1	13	1	0.0%	None	One price per province/territory
Drivers' licences	0.11%	1	1	13	1	0.0%	None	One price per province/territory
Parking fees	0.35%	1	3	140	2	0.0%	None	Explicitly w eighted Jevons index
All other passenger vehicle operating expenses	0.20%	1	1	68	2	8.6%	Expert judgement	Equi-w eighted Jevons index
City bus and subway transportation	0.49%	1	1	96	2	0.0%	None	Equi-w eighted Jevons index
Taxi and other local and commuter transportation services	0.20%	1	2	99	2	0.0%	None	Explicitly w eighted Jevons index
Air transportation	1.24%	18	18	36	12	0.0%	None	Unit value index of avg seat price by plane
Rail, highway bus and other inter-city transportation	0.09%	3	2	40	2	0.0%	None	Explicitly w eighted Jevons index
Other public transportation	0.13%	1	4	15	2	0.0%	None	Explicitly w eighted Jevons index
sub-total	18.1%	107	122					

Appendix B Detailed Calculation Features of Basic Class Indices

Basic class name	% of basket weight	Number of elementary aggregates	Number of representative products	Sample size (Canada Level)	Collection frequency (months per year)	% of prices quality adjusted	Quality adjustment method	Formula / methodology
Health and personal care								
Prescribed medicines	0.77%	17	25	1,410	12	0.3%	Overall mean imputation	Equi-w eighted Jevons index
Non-prescribed medicines	0.46%	1	4	1,054	12	1.0%	Overall mean imputation	Equi-w eighted Jevons index
Eye care goods	0.32%	4	3	99	3	1.6%	Overall mean imputation	Equi-w eighted Jevons index
Other health care goods	0.03%	1	1	279	12	0.9%	Overall mean imputation	Equi-w eighted Jevons index
Eye care services	0.08%	1	3	310	5	0.3%	Expert judgement	Equi-w eighted Jevons index
Dental care services	0.64%	3	3	47	2	0.0%	Expert judgement	Equi-w eighted Jevons index
Other health care services	0.40%	1	1	15	2	0.0%	Expert judgement	Equi-w eighted Jevons index
Personal soap	0.08%	1	1	291	12	0.6%	Overall mean imputation	Equi-w eighted Jevons index
Toiletry items and cosmetics	0.63%	3	6	1,509	12	0.8%	Overall mean imputation	Equi-w eighted Jevons index
Oral-hygiene products	0.09%	1	2	572	12	0.7%	Overall mean imputation	Equi-w eighted Jevons index
Other personal care supplies and equipment	0.36%	4	5	1,234	12	0.9%	Overall mean imputation	Equi-w eighted Jevons index
Personal care services	0.86%	3	2	56	4	1.1%	Expert judgement	Equi-w eighted Jevons index
Sub-total	4.7%	40	56					

Appendix B Detailed Calculation Features of Basic Class Indices

Basic class name	% of basket weight	Number of elementary aggregates	Number of representative products	Sample size (Canada Level)	Collection frequency (months per year)	% of prices quality adjusted	Quality adjustment method	Formula / methodology
Recreation, education and reading								
Sporting and exercise equipment	0.22%	9	14	231	3	10.5%	Overall mean imputation	Equi-w eighted Jevons index
Toys, games (excluding video games) and hobby supplies	0.31%	5	5	373	12	3.0%	Overall mean imputation	Equi-w eighted Jevons index
Computer equipment, software and supplies	0.42%	1	1	13	12	0.0%	Hedonic imputation	Equi-w eighted Jevons index
Multipurpose digital devices	0.19%	2	2	100	12	6.0%	Hedonic imputation	Equi-w eighted Jevons index
Photographic equipment and supplies	0.07%	3	2	23	6	6.9%	Overall mean imputation	Equi-w eighted Jevons index
Other recreational equipment	0.16%	3	1	175	5	7.6%	Overall mean imputation	Equi-w eighted Jevons index
Recreational services	0.18%	2	2	70	6	0.1%	Overall mean imputation	Equi-w eighted Jevons index
Purchase of recreational vehicles and outboard motors	0.93%	6	14	243	3	9.4%	Overall mean imputation	Equi-w eighted Jevons index
Fuel, parts and accessories for recreational vehicles	0.07%	1	N/A	N/A	N/A	N/A	N/A - Estimated by proxy	NA - Estimated by proxy
Insurance, licences and other services for recreational vehicles	0.24%	1	N/A	N/A	N/A	N/A	N/A - Estimated by proxy	NA - Estimated by proxy
Audio equipment	0.09%	6	3	222	6	8.3%	Hedonic imputation	Equi-w eighted Jevons index
Video equipment	0.28%	5	8	625	6	24.8%	Hedonic imputation	Equi-w eighted Jevons index
Rental of digital media	0.01%	1	2	46	5	0.0%	Overall mean imputation	Equi-w eighted Jevons index
Purchase of digital media	0.14%	4	7	329	5	2.2%	Overall mean imputation	Equi-w eighted Jevons index
Other home entertainment equipment, parts and services	0.02%	1	N/A	N/A	N/A	N/A	Overall mean imputation	Equi-w eighted Jevons index
Traveller accommodation	1.02%	19	2	901	12	0.0%	Expert judgement	Equi-w eighted Jevons index
Travel tours	0.90%	5	21	333	3	1.8%	Expert judgement	Equi-w eighted Jevons index
Spectator entertainment (excluding video and audio subscription services)	0.39%	6	13	399	5 to 12	0.0%	None - unit value index	Unit value index of average seat price in stadium/venue for sports and theatre tickets
Video and audio subscription services	1.20%	1	1	198	4	0.0%	None - profiles method	Explicitly w eighted Jevons index
Use of recreational facilities and services	0.75%	7	5	108	2	0.0%	Expert judgement	Equi-w eighted Jevons index
All other cultural and recreational services	0.14%	1	N/A	N/A	N/A	N/A	N/A - Estimated by Proxy	NA - Estimated by Proxy
Tuition fees	2.16%	3	1	Census of all programs in 32 universities	1	0.0%	None	Laspeyres index
School textbooks and supplies	0.23%	2	2	45	1	0.0%	None	Equi-w eighted Jevons index
Other lessons, courses and education services	0.43%	1	1	50	2	0.2%	Expert judgement	Equi-w eighted Jevons index
Newspapers	0.04%	2	4	134	12	0.0%	None	Explicitly w eighted Jevons index
Magazines and periodicals	0.04%	4	4	189	12	0.0%	None	Explicitly w eighted Jevons index
Books and reading material (excluding textbooks)	0.23%	4	10	202	4	0.1%	None - bestsellers method	Equi-w eighted Jevons index
Other reading material (excluding textbooks)	0.01%	1	N/A	N/A	N/A	N/A	N/A - Estimated by Proxy	NA - Estimated by Proxy
Sub-total	10.9%	106	125					

Appendix B Detailed Calculation Features of Basic Class Indices

Basic class name	% of basket weight	Number of elementary aggregates**	Number of representative products	Sample size (Canada Level)***	Collection frequency (months per year)	% of prices quality adjusted****	Quality adjustment method	Formula / methodology
Alcoholic beverages and tobacco products								
Beer served in licensed establishments	0.23%	1	1	111	4	0.0%	Expert judgement	Equi-w eighted Jevons index
Wine served in licensed establishments	0.09%	1	2	210	4	6.5%	Expert judgement	Equi-w eighted Jevons index
Liquor served in licensed establishments	0.12%	1	1	109	4	0.7%	Expert judgement	Equi-w eighted Jevons index
Beer purchased from stores	0.53%	1	17	217	12	0.2%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Wine purchased from stores	0.38%	7	34	746	12	1.0%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Liquor purchased from stores	0.27%	13	30	667	12	0.3%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Other alcoholic beverages purchased in stores	0.01%	1	N/A	N/A	N/A	N/A	N/A - Estimated by Proxy	N/A - Estimated by Proxy
Cigarettes	1.15%	1	6	556	12	0.4%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Other tobacco products and smokers' supplies	0.07%	1	N/A	N/A	N/A	N/A	N/A - Estimated by Proxy	N/A - Estimated by Proxy
Sub-total	2.9%	27	91					
Total	100.0%	695	949					

Notes:

* The relative basket weight (in %) refers to the introduction of the 2013 basket, at the month of linking in. Figures may not add up to 100% as a result of rounding.

** Elementary aggregate to Basic class correspondence may be 1 to 1 or many to 1. Some elementary aggregates may not be directly calculated (see Chapter 6).

*** The average monthly sample size takes into account collection frequency. Not all Consumer Price Index categories are priced on a monthly basis.

**** The frequency of quality adjustment is calculated as the incidence of quality adjustments in the calendar year 2012, divided by the number of price quotes collected (excluding non-pricing months).

Source: Statistics Canada, Consumer Prices Division.

Appendix C Detailed Chronology of Basket Updates and Changes to the Consumer Price Index

Basket Reference Year	Basket link month ¹	Basket start month ²	Basket end month ³	Food Basket	Revisions at basket update	Target population/geographical coverage	New products introduced	Other notable changes
1913		Jan-1914	Dec-1927	1913	N/A	N/A	N/A	Annual indices were available from 1913. January 1914 marked the introduction of continuous monthly indices.
1926	Dec-1927	Jan-1928	Aug-1940	1926	N/A	N/A	N/A	N/A
1937 - 1938	Aug-1940	Sept-1940	Dec-1948	1937-1938	N/A	Urban wage-earner families with annual incomes during the basket reference period between \$450 and \$2,500.	N/A	N/A
1947-1948 (Sept 1947 - Aug 1948)	Dec-1948	Jan-1949	Dec-1960	1947-1948	Index values were revised back to the basket link month, January 1949, when the basket was introduced in August 1952.	All Canadian families living in 27 Canadian cities with a population over 30,000, ranging in size from two adults to two adults with four children, and with annual incomes during the basket reference period ranging from \$1,650 to \$4,050.	Owned accommodation was introduced into the CPI.	<ul style="list-style-type: none"> The name of the index was changed from "Cost-of-living index" to "Consumer Price Index (CPI)". Seasonal baskets were used for food
1957	Dec-1960	Jan-1961	Apr-1973	1957	This was the first basket in which the official CPI values previously released were not revised and a "no revision" policy was adopted for the CPI. Index values under the new 1957 basket were calculated back to January 1957 for comparison purposes only.	Same as previous basket.	Forty-three new products were added to the basket. Examples include: frozen foods, air travel and the purchase and repair of television sets. Twelve products were removed from the basket. Examples include: canned straw berries, ice, brooms, hospital rates, radio licenses.	N/A

Appendix C Detailed Chronology of Basket Updates and Changes to the Consumer Price Index

Basket Reference Year	Basket link month ²	Basket start month	Basket end month	Food Basket	Revisions at basket update	Target population/geographical coverage	New products introduced	Other notable changes
1967	Apr-1978	May -1973	Sept-1978	1969	"No revision" policy.	All Canadian families living in urban centres with metropolitan populations exceeding 30,000, ranging in size from two to six persons, consisting of any combination of adults or adults and children, and with annual incomes during the basket reference period ranging from \$4,000 to \$12,000.	Forty-four new products were added to the basket. Examples include: parking, stereos, cameras, hotels/motels, tuition fees and alcohol consumed in licensed premises. Twenty-four products were removed from the basket. Examples include: lard, coal, wool blanket, knitting yarn, doctors' services, prepaid medical care.	<ul style="list-style-type: none"> A supplementary product classification was created in order to calculate separate indices for goods and services. This marked the return to annual weights for food, replacing the seasonal food weights used in the CPI since 1949.
1974	Sep-78	Oct-78	Mar-82	1974	Previously published city indices were revised to reflect an expanded shelter component.	Canadian families and unattached individuals living in private households in urban centres with populations of 30,000 and over. This was the first time that family size and household income were not determinants of the target population.	N/A	<ul style="list-style-type: none"> A policy of regular basket updates was established, with the updates tied to a four-year cycle of the Family Expenditure Survey (FAMEX). National indices were calculated as weighted averages of the corresponding indices for 59 urban centres. The New Housing Price Index (NHPI) replaced the Residential Building Construction Input Price Index in the CPI series measuring homeowners' replacement cost, mortgage interest cost and insurance for owned accommodation.

Appendix C Detailed Chronology of Basket Updates and Changes to the Consumer Price Index

Basket Reference Year ¹	Basket link month ²	Basket start month ³	Basket end month ⁴	Food Basket ⁵	Revisions at basket update	Target population/geographical coverage	New products introduced	Other notable changes
1978	Mar-1982	Apr-1982	Dec-1984	1978	N/A	<ul style="list-style-type: none"> The general target population remained the same as in the previous basket. Indices for two northern cities, Whitehorse and Yellowknife, were calculated for the first time. Sixty-four urban centres were grouped into 31 strata, using geographical proximity and urban centre size as major criteria of this stratification. 	N/A	N/A
1982	Dec-1984	Jan-1985	Dec-1988	1982	N/A	<ul style="list-style-type: none"> Whitehorse and Yellowknife were incorporated into the calculation of the All items CPI. 	N/A	A standard classification of goods and services (the Consumer Classification System) was introduced.
1986	Dec-1988	Jan-1989	Dec-1994	1986	N/A	<ul style="list-style-type: none"> Eighty-two urban centres were grouped into 34 strata. 	N/A	N/A

Appendix C – Detailed Chronology of Basket Updates and Changes to the Consumer Price Index

Basket Reference Year ¹	Basket link month ²	Basket start month ³	Basket end month ⁴	Food Basket ⁵	Revisions at basket update	Target population/geographical coverage	New products introduced	Other notable changes
1992	Dec-1994	Jan-1995	Dec-1997	1992	N/A	<p>Target population was expanded to include expenditures made by residents of smaller cities, towns and rural communities.</p> <p>Target population was expanded to include all private households in Canada. The condition of population equal to or greater than 30,000 was dropped.</p> <p>Also added were expenditures made by households that existed for only part of the basket reference year 1992 (such as college students living separately during the school year).</p>	N/A	<ul style="list-style-type: none"> The introduction of the 1992 basket was postponed by two years to ensure it would reflect adjustments to consumption patterns resulting from the introduction of the Goods and Services Tax (GST) and the removal of the Federal Sales tax in January 1991. The "housing" component from the 1986 basket was split into two major components: "shelter" and "household operations, furnishings and equipment". This brought the number of major components to a total of eight. Also, the definition of "shelter" was changed. The traveller accommodation category, which was part of the 1986 definition of "shelter", was moved to "recreation" with the introduction of the 1992 basket. To provide some continuity certain aggregates were reconstructed using their 1986 basket definitions.
1996	Dec-1997	Jan-1998	Dec-2002	1996	N/A	<p>Target population was expanded to include all private households in Canada. The condition of population equal to or greater than 30,000 was dropped.</p>	N/A	<p>No adjustment was made to the basket weight for alcohol.</p>

Appendix C Detailed Chronology of Basket Updates and Changes to the Consumer Price Index

Basket Reference Year ¹	Basket link month ²	Basket start month ³	Basket end month ⁴	Food Basket ⁵	Revisions at basket update	Target population/geographical coverage	New products introduced	Other notable changes
2001	Dec-2002	Jan-2003	Apr-2007	2001	N/A	An index for Iqaluit, the capital city of the newly created Territory of Nunavut, was calculated from December 2002 onwards with December 2002 as the time base.	Internet access services and financial services were both added to the CPI basket as new product classes.	The first CPI basket to be based on the Survey of Household Spending (SHS) rather than on the Family Expenditure Survey (FAMEX). The CPI classification for clothing was collapsed into women's clothing, men's clothing and children's clothing, since the SHS did not have the more detailed breakdown previously available in FAMEX.
2005	Apr-2007	May-2007	Apr-2011	2001	N/A	N/A	Medical services not covered by provincial health care systems were introduced into the basket.	N/A
2009	Apr-2011	May-2011	Jan-2013	2009	N/A	N/A	Several new product classes were added to the CPI basket including smartphones, tablet PCs, funeral services, retail club memberships, government services (e.g. Passport fees).	N/A

Appendix C Detailed Chronology of Basket Updates and Changes to the Consumer Price Index

Basket Reference Year	Basket link month	Basket start month	Basket end month	Food Basket	Revisions at basket update	Target population/ geographical coverage	New products introduced	Other notable changes
2011	Jan-2013	Feb-2013		2011	N/A	N/A	N/A	The first basket update using the redesigned Survey of Household Spending (SHS-R). The first biennial basket update.
2013	Dec-14	Jan-15		2013	N/A	N/A	Additional fruits and vegetables added to list of elementary aggregates. Online video subscriptions included with satellite and cable video subscriptions.	Certain obsolete products such as 35mm film removed from list of elementary aggregates. Clothing elementary aggregates below the Basic Class level reorganised to better represent the current clothing market.

Notes:

1. Expenditure weight reference period.
 2. Month in which the new basket weights are chained to the old basket weights.
 3. First month the Consumer Price Index (CPI) calculation uses the new basket weights.
 4. Last month the CPI calculation uses the new basket weights.
 5. Food expenditure reference period.
- Source: Statistics Canada, Consumer Prices Division.

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LESLIE AUSTIN

Plaintiff and

BELL CANADA ET AL

Defendants

Court File No.: CV-18-590105-00CP

0647

**ONTARIO
SUPERIOR COURT OF JUSTICE**

Proceeding commenced at Toronto

Proceeding under the *Class Proceedings Act, 1992*

**MOTION RECORD OF THE PLAINTIFF
(Certification and Summary Judgment Motion
Returnable April 24 & 25, 2019)
VOLUME 1 OF 2**

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This is Exhibit "G" referred to in the Affidavit of Matthew Baer, sworn before me this this 24th day of June, 2021.

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Christina Nolle
416A9D39CDBD474...

A Commissioner, etc.

*Virtually commissioned and electronically signed
pursuant to Ontario Regulation 431/20:
Administering Oath or Declaration Remotely*

Court File No.: CV-18-590105-00CP

ONTARIO
SUPERIOR COURT OF JUSTICE

BETWEEN:

LESLIE AUSTIN

Plaintiff

- and -

**BELL CANADA, BELL MEDIA INC.,
EXPERTECH NETWORK INSTALLATION INC., and BELL MOBILITY INC.**
Defendants

Proceeding under the *Class Proceedings Act, 1992*

**MOTION RECORD OF THE PLAINTIFF
(Certification and Summary Judgment Motion
Returnable April 24 & 25, 2019)
VOLUME 2 OF 2**

July 27, 2018

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**MOTION RECORD OF THE PLAINTIFF
(Certification and Summary Judgment Motion)**

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*THIS IS EXHIBIT "H" REFERRED TO IN THE
AFFIDAVIT OF JASMINE RANDHAWA
SWORN BEFORE ME, THIS 28 DAY OF JULY, 2018*



A COMMISSIONER FOR TAKING AFFIDAVITS, ETC.
Brittany Tovee

Catalogue no. 62-001-X

The Consumer Price Index

October 2016



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Consumer Prices Division

The Consumer Price Index

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Canada owes the success of its statistical system to a long-standing partnership between Statistics Canada, the citizens of Canada, its businesses, governments and other institutions. Accurate and timely statistical information could not be produced without their continued cooperation and goodwill.

User information

Symbols

The following standard symbols are used in Statistics Canada publications:

- . not available for any reference period
- .. not available for a specific reference period
- ... not applicable
- 0 true zero or a value rounded to zero
- 0^s value rounded to 0 (zero) where there is a meaningful distinction between true zero and the value that was rounded
- p preliminary
- r revised
- x suppressed to meet the confidentiality requirements of the *Statistics Act*
- E use with caution
- F too unreliable to be published
- * significantly different from reference category ($p < 0.05$)

Note on CANSIM

Data that appears in the **The Consumer Price Index** (catalogue no. 62-001-X) are also available electronically, free of charge under the *Statistics Canada Open Licence Agreement*, in our CANSIM (Canadian Socio-Economic Information Management System) database through the Internet, under tables 326-0009, 326-0012, 326-0015, 326-0020, 326-0021, 326-0022 and 326-0031. In general, *CANSIM* provides a longer historical series. For further information on *CANSIM* call 1-800-263-1136.

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Note to users

The Consumer Price Index is published monthly and is not subject to revisions.

Index for the month	Release date
December 2015	January 22, 2016
January 2016	February 19, 2016
February 2016	March 18, 2016
March 2016	April 22, 2016
April 2016	May 20, 2016
May 2016	June 17, 2016
June 2016	July 22, 2016
July 2016	August 19, 2016
August 2016	September 23, 2016
September 2016	October 21, 2016
October 2016	November 18, 2016
November 2016	December 22, 2016
December 2016	January 20, 2017

Please note that the analytical text and charts previously found in this publication continue to be available in *The Daily*.

Data on inter-city indexes of price differentials of consumer goods and services, appearing in Table 15, have been updated to October 2015.

At the request of the Bank of Canada, Statistics Canada will produce and publish the Bank's three preferred measures of core inflation: CPI-trim (trimmed mean), CPI-median (weighted median), and CPI-common (common component). As of the Consumer Price Index (CPI) release on December 22, 2016, the following changes in the publication will be implemented:

1. The row titled "Bank of Canada's core index" will be deleted from Table 1 and Table 2.
2. The row titled "All-items excluding eight of the most volatile components (Bank of Canada definition)" will be deleted from Table 2.
3. The subsection titled "Bank of Canada's core index" will be omitted from the Data quality, concepts and methodology section.
4. Table 6 will be replaced with a new table on recent data for the Bank of Canada's preferred measures of core inflation.

The existing measure of core inflation will continue to be produced and published by Statistics Canada, but will no longer be referred to as the Bank of Canada's core index (CPIX). Instead, it will be titled "Consumer Price Index (CPI), all-items excluding eight of the most volatile components as defined by the Bank of Canada and excluding the effect of changes in indirect taxes". The current vectors associated with this measure will be available in their current CANSIM tables (326-0020 and 326-0022) until March 2017. After that, these vectors will be moved and published in a new CANSIM table (326-0023) containing the Bank of Canada's preferred measures of core inflation.

Methodology documents have been created to help data users understand the calculation of these preferred measures of core inflation:

- *Bank of Canada's Preferred Measures of Core Inflation – General Information Document*
- *Consumer Price Index: The Bank of Canada's Preferred Measures of Core Inflation – Methodology Document*

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Highlights

Main contributors to the 12-month change in the CPI:

Main upward contributors:

- Purchase of passenger vehicles (+4.4%)
- Homeowners' replacement cost (+4.1%)
- Electricity (+5.3%)
- Food purchased from restaurants (+2.6%)
- Property taxes and other special charges (+2.8%)

Main downward contributors:

- Travel tours (-8.7%)
- Fresh fruit (-7.4%)
- Meat (-1.7%)
- Fresh vegetables (-3.6%)
- Dairy products (-2.4%)

Main contributors to the monthly change in the CPI, not seasonally adjusted:

Main upward contributors:

- Gasoline (+3.7%)
- Property taxes and other special charges (+2.8%)
- Purchase of passenger vehicles (+0.6%)
- Passenger vehicle insurance premiums (+1.0%)
- Women's clothing (+1.0%)

Main downward contributors:

- Traveller accommodation (-11.4%)
- Travel tours (-2.7%)
- Fresh vegetables (-1.9%)
- Fresh fruit (-2.0%)
- Air transportation (-1.4%)

Analysis

Please note that the analytical text and charts previously found in this section continue to be available in *The Daily*.

Related products

Selected publications from Statistics Canada

62-010-X	Consumer Prices and Price Indexes
62-557-X	Your Guide to the Consumer Price Index
62F0014M	Analytical Series - Prices Division
62-553-X	The Canadian Consumer Price Index Reference Paper

Selected technical and analytical products from Statistics Canada

62F0014M1996001	How Inflation and Income Tax Affect the Return on a Safe Investment
62F0014M2001014	Televisions: Quality Changes and Scanner Data
62F0014M2001015	Housing Depreciation in the Canadian CPI

Selected CANSIM tables from Statistics Canada

326-0009	Average retail prices for gasoline and fuel oil, by urban centre, monthly
326-0012	Average retail prices for food and other selected items, monthly
326-0015	Inter-city indexes of price differentials of consumer goods and services, annual
326-0020	Consumer Price Index, monthly
326-0021	Consumer Price Index, annual
326-0022	Consumer Price Index, seasonally adjusted, monthly
326-0031	Basket Weights of the Consumer Price Index, occasional

Selected surveys from Statistics Canada

2301	Consumer Price Index
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Selected summary tables from Statistics Canada

- *Consumer Price Index, by province (monthly)*
- *Consumer Price Index, by city (monthly)*
- *Consumer Price Index, food, by province (monthly)*
- *Consumer Price Index, shelter, by province (monthly)*
- *Consumer Price Index, household operations, furnishings and equipment by province (monthly)*
- *Consumer Price Index, clothing and footwear, by province (monthly)*
- *Consumer Price Index, transportation, by province (monthly)*
- *Consumer Price Index, health and personal care, by province (monthly)*
- *Consumer Price Index, recreation, education and reading, by province (monthly)*
- *Consumer Price Index, alcoholic beverages and tobacco products, by province (monthly)*
- *Canada: Economic and financial data*
- *Consumer Price Index, by province*
- *Consumer Price Index, historical summary, by province or territory*
- *Gasoline and fuel oil, average retail prices by urban centre (monthly)*
- *Food and other selected items, average retail prices (monthly)*
- *Gasoline and fuel oil, average retail prices by urban centre*
- *Food and other selected items, average retail prices*
- *Consumer Price Index, food, by province*
- *Consumer Price Index, shelter, by province*
- *Consumer Price Index, household operations, furnishings and equipment, by province*
- *Consumer Price Index, clothing and footwear, by province*
- *Consumer Price Index, transportation, by province*
- *Consumer Price Index, health and personal care, by province*
- *Consumer Price Index, recreation, education and reading, by province*
- *Consumer Price Index, alcoholic beverages and tobacco products, by province*
- *Inter-city indexes of consumer price levels*

- *Consumer Price Index, by city*
- *Consumer Price Index, historical summary*
- *Economic indicators, by province and territory (monthly and quarterly)*

For further reading

Detailed information on the methodology and concepts of the CPI is contained in *The Canadian Consumer Price Index Reference Paper* (Occasional), catalogue no. 62-553-X.

A brief non-technical document entitled *Your Guide to the Consumer Price Index* (Occasional) catalogue no. 62-557-X answers the frequently asked questions about the construction and use of the CPI.

For further information, contact the Consumer Prices Division, Statistics Canada, Ottawa, Ontario K1A 0T6 (613-951-9606), or you can also search through the Statistics Canada catalogue which lists all current products and services available from Statistics Canada.

Statistical tables

The Consumer Price Index – October 2016

Table 1
The Consumer Price Index, major components and special aggregates, ¹ Canada, not seasonally adjusted

	CANSIM vector number	Relative importance ²	Indexes			Percentage change	
			October 2015	September 2016	October 2016	September 2016 to October 2016	October 2015 to October 2016
			2002=100			%	
All-items	(v41690973)	100.00	127.2	128.8	129.1	0.2	1.5
Food	(v41690974)	16.41	140.9	140.4	139.9	-0.4	-0.7
Shelter	(v41691050)	26.80	134.3	136.2	136.9	0.5	1.9
Household operations, furnishings and equipment	(v41691067)	13.14	120.6	121.9	122.1	0.2	1.2
Clothing and footwear	(v41691108)	6.08	97.7	96.8	97.5	0.7	-0.2
Transportation	(v41691128)	19.10	125.8	128.3	129.6	1.0	3.0
Health and personal care	(v41691153)	4.73	120.7	122.4	122.8	0.3	1.7
Recreation, education and reading	(v41691170)	10.89	110.8	113.8	112.4	-1.2	1.4
Alcoholic beverages and tobacco products	(v41691206)	2.86	152.9	157.7	158.1	0.3	3.4
All-items (1992=100)	(v41713403)		151.4	153.3	153.7	0.3	1.5
Special aggregates							
Goods	(v41691222)	46.68	117.1	117.8	118.3	0.4	1.0
Durable goods	(v41691223)	12.65	87.0	89.4	89.6	0.2	3.0
Semi-durable goods	(v41691224)	7.55	98.7	98.3	98.9	0.6	0.2
Non-durable goods	(v41691225)	26.48	139.2	139.1	139.7	0.4	0.4
Services	(v41691230)	53.32	137.4	139.9	139.9	0.0	1.8
All-items excluding food	(v41691232)	83.59	124.6	126.5	127.0	0.4	1.9
All-items excluding food and energy	(v41691233)	75.80	122.2	124.3	124.5	0.2	1.9
All-items excluding energy	(v41691238)	92.21	125.5	127.2	127.3	0.1	1.4
All-items excluding gasoline	(v41693245)	96.16	126.2	127.9	128.0	0.1	1.4
All-items excluding shelter, insurance and financial services	(v41693246)	69.31	122.8	124.3	124.4	0.1	1.3
Energy	(v41691239)	7.79	146.6	147.3	150.2	2.0	2.5
All-items excluding alcoholic beverages, tobacco products and smokers' supplies	(v41691241)	97.14	126.3	127.8	128.1	0.2	1.4
Bank of Canada's core index ³	(v41693242)	85.39	127.0	128.9	129.1	0.2	1.7

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" and "User information - Note to users" sections.

Table 2
The Consumer Price Index, major components and special aggregates, ¹ Canada, seasonally adjusted²

	CANSIM vector number	Indexes			Percentage change	
		August 2016	September 2016	October 2016	August 2016 to September 2016	September 2016 to October 2016
		2002=100			%	
All-items	(v41690914)	128.5	128.7	129.0	0.2	0.2
Food	(v41690915)	142.4	141.7	141.5	-0.5	-0.1
Shelter	(v41690916)	136.2	136.2	136.9	0.0	0.5
Household operations, furnishings and equipment	(v41690917)	122.1	121.9	122.0	-0.2	0.1
Clothing and footwear	(v41690918)	94.5	94.7	94.5	0.2	-0.2
Transportation	(v41690919)	127.9	128.5	129.9	0.5	1.1
Health and personal care	(v41690920)	122.7	122.5	122.9	-0.2	0.3
Recreation, education and reading	(v41690921)	111.2	111.6	111.6	0.4	0.0
Alcoholic beverages and tobacco products	(v41690922)	157.3	157.7	158.1	0.3	0.3
Special aggregates						
All-items excluding food	(v41690923)	125.7	126.1	126.5	0.3	0.3
All-items excluding food and energy	(v41690924)	123.9	124.0	124.1	0.1	0.1
All-items excluding eight of the most volatile components (Bank of Canada definition)	(v41690925)	127.9	128.0	128.1	0.1	0.1
Bank of Canada's core index ³	(v41690926)	128.6	128.7	128.7	0.1	0.0

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" and "User information - Note to users" sections.

The Consumer Price Index – October 2016

Table 3
The Consumer Price Index, provinces, Whitehorse, Yellowknife and Iqaluit, ¹ not seasonally adjusted

	CANSIM vector number	Indexes			Percentage change	
		October 2015	September 2016	October 2016	September 2016 to October 2016	October 2015 to October 2016
		2002=100			%	
Newfoundland and Labrador	(v41691244)	129.7	134.5	134.9	0.3	4.0
Prince Edward Island	(v41691379)	129.4	130.6	131.9	1.0	1.9
Nova Scotia	(v41691513)	129.8	131.6	131.6	0.0	1.4
New Brunswick	(v41691648)	125.9	129.4	129.4	0.0	2.8
Quebec	(v41691783)	125.2	125.8	125.9	0.1	0.6
Ontario	(v41691919)	127.9	130.1	130.6	0.4	2.1
Manitoba	(v41692055)	128.0	129.0	129.4	0.3	1.1
Saskatchewan	(v41692191)	131.7	132.4	132.7	0.2	0.8
Alberta	(v41692327)	135.1	135.3	135.8	0.4	0.5
British Columbia	(v41692462)	120.6	123.2	123.1	-0.1	2.1
Whitehorse, Yukon	(v41692598)	124.5	125.9	126.1	0.2	1.3
Yellowknife, Northwest Territories	(v41692722)	131.6	131.8	132.7	0.7	0.8
Iqaluit, Nunavut (200212=100)	(v41713432)	121.1	124.5	123.8	-0.6	2.2

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

The Consumer Price Index – October 2016

Table 4-1
The Consumer Price Index, major components and selected sub-groups, Canada, not seasonally adjusted — Food

	CANSIM vector number	Indexes			Percentage change	
		October 2015	September 2016	October 2016	September 2016 to October 2016	October 2015 to October 2016
		2002=100			%	
Food	(v41690974)	140.9	140.4	139.9	-0.4	-0.7
Food purchased from stores	(v41690975)	141.3	139.3	138.4	-0.6	-2.1
Meat	(v41690976)	159.0	156.7	156.3	-0.3	-1.7
Fresh or frozen meat (excluding poultry)	(v41690977)	174.2	166.2	165.2	-0.6	-5.2
Fresh or frozen beef	(v41690978)	188.1	177.2	178.0	0.5	-5.4
Fresh or frozen pork	(v41690979)	146.7	141.8	138.8	-2.1	-5.4
Fresh or frozen poultry	(v41690981)	151.8	153.5	151.3	-1.4	-0.3
Fresh or frozen chicken	(v41690982)	159.4	157.7	159.0	0.8	-0.3
Processed meat	(v41690984)	145.2	146.1	147.5	1.0	1.6
Ham and bacon	(v41690985)	142.9	143.7	134.2	-6.6	-6.1
Other processed meat	(v41690986)	150.8	151.7	155.1	2.2	2.9
Fish, seafood and other marine products	(v41690987)	126.2	132.0	129.4	-2.0	2.5
Fish	(v41690988)	131.5	138.6	137.6	-0.7	4.6
Fresh or frozen fish (including portions and fish sticks)	(v41690989)	129.6	137.9	136.7	-0.9	5.5
Canned and other preserved fish	(v41690990)	135.9	136.8	137.0	0.1	0.8
Dairy products and eggs	(v41690992)	137.3	134.6	133.7	-0.7	-2.6
Dairy products	(v41690993)	135.7	132.6	132.5	-0.1	-2.4
Fresh milk	(v41690994)	137.5	139.0	139.2	0.1	1.2
Butter	(v41690995)	133.1	137.8	131.8	-4.4	-1.0
Cheese	(v41690996)	134.7	127.6	129.3	1.3	-4.0
Ice cream and related products	(v41690997)	131.0	123.5	125.3	1.5	-4.4
Eggs	(v41690999)	156.2	158.2	147.5	-6.8	-5.6
Bakery and cereal products (excluding baby food)	(v41691000)	155.1	151.5	151.9	0.3	-2.1
Bakery products	(v41691001)	163.9	162.6	162.2	-0.2	-1.0
Bread, rolls and buns	(v41691002)	191.6	184.2	181.5	-1.5	-5.3
Cookies and crackers	(v41691003)	137.2	139.4	142.0	1.9	3.5
Other bakery products	(v41691004)	142.5	146.2	146.3	0.1	2.7
Cereal products (excluding baby food)	(v41691005)	139.5	132.4	134.0	1.2	-3.9
Rice and rice-based mixes	(v41691006)	140.7	143.5	141.2	-1.6	0.4
Breakfast cereal and other cereal products (excluding baby food)	(v41691007)	126.6	119.3	122.1	2.3	-3.6
Pasta products	(v41691008)	166.2	152.0	152.4	0.3	-8.3
Flour and flour-based mixes	(v41691009)	148.1	146.6	143.3	-2.3	-3.2
Fruit, fruit preparations and nuts	(v41691010)	133.9	129.7	127.0	-2.1	-5.2
Fresh fruit	(v41691011)	131.8	124.6	122.1	-2.0	-7.4
Apples	(v41691012)	141.1	152.2	136.9	-10.1	-3.0
Oranges	(v41691013)	135.9	130.1	131.2	0.8	-3.5
Bananas	(v41691014)	142.6	134.5	135.4	0.7	-5.0
Other fresh fruit	(v41691015)	124.9	114.3	112.9	-1.2	-9.6
Preserved fruit and fruit preparations	(v41691016)	129.7	130.8	126.3	-3.4	-2.6
Fruit juices	(v41691017)	132.3	132.8	126.1	-5.0	-4.7
Other preserved fruit and fruit preparations	(v41691018)	123.3	125.4	124.2	-1.0	0.7
Nuts	(v41691019)	150.7	154.7	154.9	0.1	2.8
Vegetables and vegetable preparations	(v41691020)	124.0	122.9	120.8	-1.7	-2.6
Fresh vegetables	(v41691021)	120.6	118.5	116.3	-1.9	-3.6
Potatoes	(v41691022)	97.8	106.7	98.4	-7.8	0.6
Tomatoes	(v41691023)	99.1	92.7	99.2	7.0	0.1
Lettuce	(v41691024)	131.0	100.7	104.8	4.1	-20.0
Other fresh vegetables	(v41691025)	133.5	133.8	129.9	-2.9	-2.7
Preserved vegetables and vegetable preparations	(v41691026)	137.6	140.5	138.5	-1.4	0.7
Frozen and dried vegetables	(v41691027)	141.5	141.9	139.4	-1.8	-1.5
Canned vegetables and other vegetable preparations	(v41691028)	137.1	141.0	139.2	-1.3	1.5
Other food products and non-alcoholic beverages	(v41691029)	134.3	133.3	133.2	-0.1	-0.8
Sugar and confectionery	(v41691030)	138.1	140.8	142.4	1.1	3.1
Edible fats and oils	(v41691033)	148.3	146.1	144.6	-1.0	-2.5
Coffee and tea	(v41691036)	137.4	133.0	133.6	0.5	-2.8
Condiments, spices and vinegars	(v41691039)	127.0	120.8	121.2	0.3	-4.6
Other food preparations	(v41691040)	139.8	138.8	138.6	-0.1	-0.9
Non-alcoholic beverages	(v41691045)	122.4	124.1	122.4	-1.4	0.0
Food purchased from restaurants	(v41691046)	139.8	143.1	143.5	0.3	2.6
Food purchased from table-service restaurants	(v41691047)	141.3	144.8	145.1	0.2	2.7
Food purchased from fast food and take-out restaurants	(v41691048)	136.5	139.3	140.0	0.5	2.6

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

The Consumer Price Index – October 2016

Table 4-2
The Consumer Price Index, major components and selected sub-groups, Canada, not seasonally adjusted — Shelter

	CANSIM vector number	Indexes			Percentage change	
		October 2015	September 2016	October 2016	September 2016 to October 2016	October 2015 to October 2016
		2002=100			%	
Shelter	(v41691050)	134.3	136.2	136.9	0.5	1.9
Rented accommodation	(v41691051)	118.8	119.4	119.5	0.1	0.6
Rent	(v41691052)	118.8	119.3	119.4	0.1	0.5
Owned accommodation	(v41691055)	136.3	138.4	139.4	0.7	2.3
Mortgage interest cost ¹	(v41691056)	103.6	102.9	102.8	-0.1	-0.8
Homeowners' replacement cost	(v41691057)	154.7	160.7	161.0	0.2	4.1
Property taxes and other special charges	(v41691058)	152.7	152.7	156.9	2.8	2.8
Homeowners' home and mortgage insurance	(v41691059)	214.9	220.2	220.8	0.3	2.7
Homeowners' maintenance and repairs	(v41691060)	133.2	135.4	137.0	1.2	2.9
Water, fuel and electricity	(v41691062)	151.9	155.8	156.2	0.3	2.8
Electricity	(v41691063)	144.2	152.1	151.8	-0.2	5.3
Water	(v41691064)	222.4	232.8	232.8	0.0	4.7
Natural gas	(v41691065)	111.6	107.1	107.8	0.7	-3.4
Fuel oil and other fuels	(v41691066)	190.0	174.7	183.6	5.1	-3.4

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

Table 4-3
The Consumer Price Index, major components and selected sub-groups, Canada, not seasonally adjusted — Household operations, furnishings and equipment

	CANSIM vector number	Indexes			Percentage change	
		October 2015	September 2016	October 2016	September 2016 to October 2016	October 2015 to October 2016
		2002=100			%	
Household operations, furnishings and equipment	(v41691067)	120.6	121.9	122.1	0.2	1.2
Household operations	(v41691068)	134.5	135.2	135.7	0.4	0.9
Communications	(v41691069)	128.1	126.9	127.4	0.4	-0.5
Telephone services	(v41691070)	124.6	123.1	124.1	0.8	-0.4
Postal and other communications services	(v41691071)	195.4	195.6	195.6	0.0	0.1
Internet access services (200212=100)	(v41693216)	125.1	125.5	124.2	-1.0	-0.7
Child care and housekeeping services	(v41691072)	152.7	155.8	156.7	0.6	2.6
Child care services	(v41691073)	151.8	154.9	155.5	0.4	2.4
Housekeeping services	(v41691074)	155.1	158.3	159.7	0.9	3.0
Household cleaning products	(v41691075)	113.0	110.9	111.4	0.5	-1.4
Paper, plastic and aluminum foil supplies	(v41691078)	124.6	122.7	125.3	2.1	0.6
Other household goods and services	(v41691081)	142.5	145.3	145.6	0.2	2.2
Pet food and supplies	(v41691082)	136.2	138.4	139.6	0.9	2.5
Seeds, plants and cut flowers	(v41691083)	120.7	122.7	123.1	0.3	2.0
Other horticultural goods	(v41691084)	109.2	109.3	109.8	0.5	0.5
Financial services (200212=100)	(v41693229)	142.8	144.5	144.5	0.0	1.2
Household furnishings and equipment	(v41691087)	96.9	99.2	98.8	-0.4	2.0
Furniture and household textiles	(v41691088)	96.0	98.5	98.2	-0.3	2.3
Furniture	(v41691089)	93.0	94.9	94.7	-0.2	1.8
Household textiles	(v41691093)	107.3	111.9	111.2	-0.6	3.6
Household equipment	(v41691097)	87.7	89.3	88.8	-0.6	1.3
Household appliances	(v41691098)	89.3	88.6	88.7	0.1	-0.7
Non-electric kitchen utensils, tableware and cookware	(v41691103)	80.0	81.4	79.0	-2.9	-1.3
Services related to household furnishings and equipment	(v41691107)	175.9	184.6	184.6	0.0	4.9

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

The Consumer Price Index – October 2016

Table 4-4

The Consumer Price Index, major components and selected sub-groups, Canada, not seasonally adjusted — Clothing and footwear

	CANSIM vector number	Indexes			Percentage change	
		October 2015	September 2016	October 2016	September 2016 to October 2016	October 2015 to October 2016
		2002=100			%	
Clothing and footwear	(v41691108)	97.7	96.8	97.5	0.7	-0.2
Clothing	(v41691109)	87.8	86.8	87.4	0.7	-0.5
Women's clothing	(v41691110)	83.7	83.3	84.1	1.0	0.5
Men's clothing	(v41691111)	96.2	95.4	96.2	0.8	0.0
Children's clothing	(v41691112)	81.7	77.6	76.8	-1.0	-6.0
Footwear	(v41691113)	96.7	95.2	95.8	0.6	-0.9
Clothing accessories, watches and jewellery	(v41691118)	138.1	139.0	140.7	1.2	1.9
Clothing material, notions and services	(v41691123)	142.4	144.5	144.5	0.0	1.5

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

Table 4-5

The Consumer Price Index, major components and selected sub-groups, Canada, not seasonally adjusted — Transportation

	CANSIM vector number	Indexes			Percentage change	
		October 2015	September 2016	October 2016	September 2016 to October 2016	October 2015 to October 2016
		2002=100			%	
Transportation	(v41691128)	125.8	128.3	129.6	1.0	3.0
Private transportation	(v41691129)	124.7	126.8	128.4	1.3	3.0
Purchase, leasing and rental of passenger vehicles	(v41691130)	95.0	98.6	99.2	0.6	4.4
Purchase and leasing of passenger vehicles	(v41691131)	94.8	98.3	98.9	0.6	4.3
Purchase of passenger vehicles	(v41691132)	95.6	99.2	99.8	0.6	4.4
Rental of passenger vehicles	(v41691134)	104.2	115.4	115.4	0.0	10.7
Operation of passenger vehicles	(v41691135)	151.5	151.8	154.5	1.8	2.0
Gasoline	(v41691136)	149.0	147.3	152.7	3.7	2.5
Passenger vehicle parts, maintenance and repairs	(v41691137)	136.5	138.6	139.0	0.3	1.8
Other passenger vehicle operating expenses	(v41691140)	162.3	163.6	164.8	0.7	1.5
Passenger vehicle insurance premiums	(v41691141)	164.8	165.1	166.7	1.0	1.2
Passenger vehicle registration fees	(v41691142)	127.2	132.0	132.0	0.0	3.8
Drivers' licences	(v41691143)	162.5	165.5	165.5	0.0	1.8
Parking fees	(v41691144)	177.0	183.3	183.3	0.0	3.6
Public transportation	(v41691146)	136.2	141.5	140.3	-0.8	3.0
Local and commuter transportation	(v41691147)	152.8	154.5	154.5	0.0	1.1
City bus and subway transportation	(v41691148)	154.8	158.0	158.0	0.0	2.1
Taxi and other local and commuter transportation services	(v41691149)	146.1	144.0	144.0	0.0	-1.4
Inter-city transportation	(v41691150)	127.4	134.2	132.6	-1.2	4.1
Air transportation	(v41691151)	124.9	132.0	130.2	-1.4	4.2
Rail, highway bus and other inter-city transportation	(v41691152)	135.4	137.3	138.2	0.7	2.1

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Table 4-6
The Consumer Price Index, major components and selected sub-groups, Canada, not seasonally adjusted — Health and personal care

	CANSIM vector number	Indexes			Percentage change	
		October 2015	September 2016	October 2016	September 2016 to October 2016	October 2015 to October 2016
		2002=100			%	
Health and personal care	(v41691153)	120.7	122.4	122.8	0.3	1.7
Health care	(v41691154)	123.2	125.5	125.3	-0.2	1.7
Health care goods	(v41713463)	102.8	104.2	103.7	-0.5	0.9
Medicinal and pharmaceutical products	(v41691156)	99.2	100.5	99.9	-0.6	0.7
Prescribed medicines	(v41691157)	89.3	89.2	89.4	0.2	0.1
Non-prescribed medicines	(v41691158)	117.1	121.4	119.2	-1.8	1.8
Eye care goods	(v41713381)	112.0	113.4	113.7	0.3	1.5
Health care services	(v41713464)	155.7	159.8	159.8	0.0	2.6
Eye care services (200704=100)	(v41693244)	120.9	123.3	123.3	0.0	2.0
Dental care services	(v41691161)	152.2	155.6	155.6	0.0	2.2
Personal care	(v41691163)	118.4	119.3	120.4	0.9	1.7
Personal care supplies and equipment	(v41691164)	105.9	105.7	107.4	1.6	1.4
Personal care services	(v41691169)	137.3	140.2	140.3	0.1	2.2

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

Table 4-7
The Consumer Price Index, major components and selected sub-groups, Canada, not seasonally adjusted — Recreation, education and reading

	CANSIM vector number	Indexes			Percentage change	
		October 2015	September 2016	October 2016	September 2016 to October 2016	October 2015 to October 2016
		2002=100			%	
Recreation, education and reading	(v41691170)	110.8	113.8	112.4	-1.2	1.4
Recreation	(v41691171)	98.0	100.6	98.8	-1.8	0.8
Recreational equipment and services (excluding recreational vehicles)	(v41691172)	54.2	54.3	54.8	0.9	1.1
Purchase and operation of recreational vehicles	(v41691179)	124.0	126.2	127.5	1.0	2.8
Home entertainment equipment, parts and services	(v41691184)	55.3	54.0	54.1	0.2	-2.2
Travel services	(v41691190)	98.0	104.0	95.7	-8.0	-2.3
Traveller accommodation ¹	(v41691191)	91.9	106.8	94.6	-11.4	2.9
Travel tours	(v41691192)	100.2	94.0	91.5	-2.7	-8.7
Other cultural and recreational services	(v41691193)	156.6	160.7	161.1	0.2	2.9
Spectator entertainment (excluding video and audio subscription services)	(v41691194)	140.3	141.1	143.9	2.0	2.6
Video and audio subscription services	(v41691195)	173.2	180.5	180.5	0.0	4.2
Use of recreational facilities and services	(v41691196)	145.9	147.5	147.0	-0.3	0.8
Education and reading	(v41691197)	154.2	158.7	158.9	0.1	3.0
Education	(v41691198)	159.4	163.3	163.5	0.1	2.6
Tuition fees	(v41691199)	166.8	171.4	171.4	0.0	2.8
Reading material (excluding textbooks)	(v41691202)	135.9	145.4	145.7	0.2	7.2
Newspapers	(v41691203)	164.0	169.0	171.1	1.2	4.3
Magazines and periodicals	(v41691204)	136.8	139.1	140.1	0.7	2.4

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

The Consumer Price Index – October 2016

Table 4-8

The Consumer Price Index, major components and selected sub-groups, Canada, not seasonally adjusted — Alcoholic beverages and tobacco products

	CANSIM vector number	Indexes			Percentage change	
		October 2015	September 2016	October 2016	September 2016 to October 2016	October 2015 to October 2016
		2002=100			%	
Alcoholic beverages and tobacco products	(v41691206)	152.9	157.7	158.1	0.3	3.4
Alcoholic beverages	(v41691207)	123.1	125.2	125.3	0.1	1.8
Alcoholic beverages served in licensed establishments	(v41691208)	135.7	138.0	138.0	0.0	1.7
Beer served in licensed establishments	(v41691209)	141.3	143.7	143.7	0.0	1.7
Liquor served in licensed establishments	(v41691211)	135.6	137.5	137.5	0.0	1.4
Alcoholic beverages purchased from stores	(v41691212)	117.5	119.4	119.6	0.2	1.8
Beer purchased from stores	(v41691213)	124.5	126.3	126.2	-0.1	1.4
Wine purchased from stores	(v41691214)	106.6	108.7	109.2	0.5	2.4
Liquor purchased from stores	(v41691215)	116.6	118.3	118.6	0.3	1.7
Tobacco products and smokers' supplies	(v41691216)	188.6	198.3	199.1	0.4	5.6
Cigarettes	(v41691217)	188.4	198.2	198.9	0.4	5.6

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

The Consumer Price Index – October 2016

Table 5
The Consumer Price Index for Canada, All-items CPI, not seasonally adjusted, historical data

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual average ¹
	2002=100												
Indexes (v41690973)													
1997	89.9	90.1	90.2	90.2	90.3	90.5	90.5	90.6	90.6	90.6	90.5	90.4	90.4
1998	90.9	91.0	91.1	91.0	91.3	91.4	91.4	91.4	91.2	91.6	91.6	91.3	91.3
1999	91.5	91.6	92.0	92.5	92.7	92.9	93.1	93.3	93.6	93.7	93.6	93.7	92.9
2000	93.5	94.1	94.8	94.5	94.9	95.5	95.8	95.7	96.1	96.3	96.6	96.7	95.4
2001	96.3	96.8	97.1	97.8	98.6	98.7	98.4	98.4	98.6	98.1	97.2	97.4	97.8
2002	97.6	98.2	98.9	99.5	99.7	99.9	100.5	100.9	100.9	101.2	101.5	101.1	100.0
2003	102.0	102.8	103.1	102.4	102.5	102.5	102.6	102.9	103.1	102.8	103.1	103.2	102.8
2004	103.3	103.5	103.9	104.1	105.0	105.1	105.0	104.8	105.0	105.2	105.6	105.4	104.7
2005	105.3	105.7	106.3	106.6	106.7	106.9	107.1	107.5	108.4	107.9	107.7	107.6	107.0
2006	108.2	108.0	108.6	109.2	109.7	109.5	109.6	109.8	109.2	109.0	109.2	109.4	109.1
2007	109.4	110.2	111.1	111.6	112.1	111.9	112.0	111.7	111.9	111.6	111.9	112.0	111.5
2008	111.8	112.2	112.6	113.5	114.6	115.4	115.8	115.6	115.7	114.5	114.1	113.3	114.1
2009	113.0	113.8	114.0	113.9	114.7	115.1	114.7	114.7	114.7	114.6	115.2	114.8	114.4
2010	115.1	115.6	115.6	116.0	116.3	116.2	116.8	116.7	116.9	117.4	117.5	117.5	116.5
2011	117.8	118.1	119.4	119.8	120.6	119.8	120.0	120.3	120.6	120.8	120.9	120.2	119.9
2012	120.7	121.2	121.7	122.2	122.1	121.6	121.5	121.8	122.0	122.2	121.9	121.2	121.7
2013	121.3	122.7	122.9	122.7	123.0	123.0	123.1	123.1	123.3	123.0	123.0	122.7	122.8
2014	123.1	124.1	124.8	125.2	125.8	125.9	125.7	125.7	125.8	125.9	125.4	124.5	125.2
2015	124.3	125.4	126.3	126.2	126.9	127.2	127.3	127.3	127.1	127.2	127.1	126.5	126.6
2016	126.8	127.1	127.9	128.3	128.8	129.1	128.9	128.7	128.8	129.1	..	..	..
Percentage change from the corresponding month of the previous year (v41690973)													
1997	2.2	2.3	1.9	1.7	1.5	1.7	1.7	1.8	1.7	1.5	0.9	0.8	1.7
1998	1.1	1.0	1.0	0.9	1.1	1.0	1.0	0.9	0.7	1.1	1.2	1.0	1.0
1999	0.7	0.7	1.0	1.6	1.5	1.6	1.9	2.1	2.6	2.3	2.2	2.6	1.8
2000	2.2	2.7	3.0	2.2	2.4	2.8	2.9	2.6	2.7	2.8	3.2	3.2	2.7
2001	3.0	2.9	2.4	3.5	3.9	3.4	2.7	2.8	2.6	1.9	0.6	0.7	2.5
2002	1.3	1.4	1.9	1.7	1.1	1.2	2.1	2.5	2.3	3.2	4.4	3.8	2.2
2003	4.5	4.7	4.2	2.9	2.8	2.6	2.1	2.0	2.2	1.6	1.6	2.1	2.8
2004	1.3	0.7	0.8	1.7	2.4	2.5	2.3	1.8	1.8	2.3	2.4	2.1	1.8
2005	1.9	2.1	2.3	2.4	1.6	1.7	2.0	2.6	3.2	2.6	2.0	2.1	2.2
2006	2.8	2.2	2.2	2.4	2.8	2.4	2.3	2.1	0.7	1.0	1.4	1.7	2.0
2007	1.1	2.0	2.3	2.2	2.2	2.2	2.2	1.7	2.5	2.4	2.5	2.4	2.2
2008	2.2	1.8	1.4	1.7	2.2	3.1	3.4	3.5	3.4	2.6	2.0	1.2	2.3
2009	1.1	1.4	1.2	0.4	0.1	-0.3	-0.9	-0.8	-0.9	0.1	1.0	1.3	0.3
2010	1.9	1.6	1.4	1.8	1.4	1.0	1.8	1.7	1.9	2.4	2.0	2.4	1.8
2011	2.3	2.2	3.3	3.3	3.7	3.1	2.7	3.1	3.2	2.9	2.9	2.3	2.9
2012	2.5	2.6	1.9	2.0	1.2	1.5	1.3	1.2	1.2	1.2	0.8	0.8	1.5
2013	0.5	1.2	1.0	0.4	0.7	1.2	1.3	1.1	1.1	0.7	0.9	1.2	0.9
2014	1.5	1.1	1.5	2.0	2.3	2.4	2.1	2.1	2.0	2.4	2.0	1.5	2.0
2015	1.0	1.0	1.2	0.8	0.9	1.0	1.3	1.3	1.0	1.0	1.4	1.6	1.1
2016	2.0	1.4	1.3	1.7	1.5	1.5	1.3	1.1	1.3	1.5	..	..	..

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

The Consumer Price Index – October 2016

Table 6
The Bank of Canada's core index, ¹ not seasonally adjusted, historical data

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual average ²
	2002=100												
Indexes (v41693242)													
1997	91.3	91.5	91.7	91.9	92.0	92.1	92.1	92.3	92.4	92.5	92.4	92.3	92.0
1998	92.6	92.9	93.0	93.0	93.2	93.2	93.3	93.4	93.4	93.7	93.7	93.5	93.2
1999	93.5	93.8	94.1	94.2	94.5	94.6	94.7	94.9	95.2	95.1	95.0	94.8	94.5
2000	94.6	95.0	95.3	95.3	95.5	95.8	95.8	96.0	96.2	96.3	96.4	96.4	95.7
2001	96.3	96.6	97.1	97.4	97.7	97.9	98.2	98.3	98.4	98.4	98.1	98.0	97.7
2002	98.1	98.8	99.2	99.6	99.8	100.0	100.2	100.7	100.9	100.9	101.2	100.7	100.0
2003	101.3	101.8	102.0	101.7	102.2	102.1	102.1	102.2	102.6	102.7	103.0	102.8	102.2
2004	102.8	103.0	103.3	103.5	103.7	103.8	104.0	103.8	104.1	104.1	104.7	104.6	103.8
2005	104.5	104.8	105.2	105.2	105.4	105.4	105.4	105.6	105.9	105.9	106.3	106.2	105.5
2006	106.2	106.6	107.0	106.9	107.5	107.2	107.5	107.7	108.3	108.4	108.6	108.4	107.5
2007	108.6	109.1	109.5	109.6	109.9	109.9	110.0	110.1	110.5	110.3	110.3	110.0	109.8
2008	110.1	110.7	110.9	111.2	111.5	111.6	111.7	112.0	112.4	112.2	113.0	112.6	111.7
2009	112.2	112.8	113.1	113.2	113.7	113.7	113.7	113.8	114.1	114.2	114.7	114.3	113.6
2010	114.4	115.2	115.0	115.3	115.7	115.6	115.5	115.6	115.8	116.3	116.3	116.0	115.6
2011	116.0	116.2	117.0	117.2	117.8	117.1	117.3	117.8	118.4	118.7	118.8	118.2	117.5
2012	118.4	118.9	119.2	119.7	119.9	119.4	119.3	119.7	119.9	120.2	120.2	119.5	119.5
2013	119.6	120.6	120.9	121.0	121.2	121.0	121.0	121.2	121.4	121.6	121.5	121.0	121.0
2014	121.3	122.1	122.5	122.7	123.3	123.2	123.1	123.7	124.0	124.4	124.1	123.7	123.2
2015	124.0	124.7	125.4	125.5	126.0	126.0	126.0	126.3	126.6	127.0	126.6	126.1	125.9
2016	126.5	127.1	128.0	128.2	128.6	128.6	128.6	128.6	128.9	129.1	..	..	..
Percentage change from the corresponding month of the previous year (v41693242)													
1997	2.1	1.9	2.1	2.2	2.1	2.2	2.0	2.0	1.8	1.9	1.2	1.3	1.9
1998	1.4	1.5	1.4	1.2	1.3	1.2	1.3	1.2	1.1	1.3	1.4	1.3	1.3
1999	1.0	1.0	1.2	1.3	1.4	1.5	1.5	1.6	1.9	1.5	1.4	1.4	1.4
2000	1.2	1.3	1.3	1.2	1.1	1.3	1.2	1.2	1.1	1.3	1.5	1.7	1.3
2001	1.8	1.7	1.9	2.2	2.3	2.2	2.5	2.4	2.3	2.2	1.8	1.7	2.1
2002	1.9	2.3	2.2	2.3	2.1	2.1	2.0	2.4	2.5	2.5	3.2	2.8	2.4
2003	3.3	3.0	2.8	2.1	2.4	2.1	1.9	1.5	1.7	1.8	1.8	2.1	2.2
2004	1.5	1.2	1.3	1.8	1.5	1.7	1.9	1.6	1.5	1.4	1.7	1.8	1.6
2005	1.7	1.7	1.8	1.6	1.6	1.5	1.3	1.7	1.7	1.7	1.5	1.5	1.6
2006	1.6	1.7	1.7	1.6	2.0	1.7	2.0	2.0	2.3	2.4	2.2	2.1	1.9
2007	2.3	2.3	2.3	2.5	2.2	2.5	2.3	2.2	2.0	1.8	1.6	1.5	2.1
2008	1.4	1.5	1.3	1.5	1.5	1.5	1.5	1.7	1.7	1.7	2.4	2.4	1.7
2009	1.9	1.9	2.0	1.8	2.0	1.9	1.8	1.6	1.5	1.8	1.5	1.5	1.7
2010	2.0	2.1	1.7	1.9	1.8	1.7	1.6	1.6	1.5	1.8	1.4	1.5	1.8
2011	1.4	0.9	1.7	1.6	1.8	1.3	1.6	1.9	2.2	2.1	2.1	1.9	1.6
2012	2.1	2.3	1.9	2.1	1.8	2.0	1.7	1.6	1.3	1.3	1.2	1.1	1.7
2013	1.0	1.4	1.4	1.1	1.1	1.3	1.4	1.3	1.3	1.2	1.1	1.3	1.3
2014	1.4	1.2	1.3	1.4	1.7	1.8	1.7	2.1	2.1	2.3	2.1	2.2	1.8
2015	2.2	2.1	2.4	2.3	2.2	2.3	2.4	2.1	2.1	2.1	2.0	1.9	2.2
2016	2.0	1.9	2.1	2.2	2.1	2.1	2.1	1.8	1.8	1.7	..	..	..

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" and "User information - Note to users" sections.

The Consumer Price Index – October 2016

Table 7
The Consumer Price Index for Canada, major components and special aggregates, not seasonally adjusted, historical data

	Major components							Special aggregates				
	Food	Shelter	Household operations, furnishings and equipment	Clothing and footwear	Transportation	Health and personal care	Recreation, education and reading	Alcoholic beverages and tobacco products	Goods ¹	Services ²	All-items excluding food and energy ³	Energy ³
CANSIM vector number	(v41690974)	(v41691050)	(v41691067)	(v41691108)	(v41691128)	(v41691153)	(v41691170)	(v41691206)	(v41691222)	(v41691230)	(v41691233)	(v41691239)
2002=100												
Annual averages⁴												
1997	89.4	90.8	93.7	97.7	90.3	91.7	91.0	72.3	91.2	89.5	91.5	83.9
1998	90.9	91.1	95.1	98.8	89.6	93.6	93.0	74.9	91.4	91.1	92.7	80.5
1999	92.0	92.3	95.8	100.1	92.6	95.4	94.7	76.5	93.1	92.8	94.0	85.0
2000	93.3	95.6	96.7	100.3	97.2	97.0	97.0	79.0	96.0	94.8	95.5	96.8
2001	97.4	99.1	98.6	100.7	97.3	96.9	98.4	85.0	98.4	97.1	97.3	102.0
2002	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2003	101.7	103.2	100.7	98.2	105.2	101.4	100.8	110.1	101.9	103.6	102.5	107.9
2004	103.8	105.8	101.2	98.0	107.7	102.8	101.1	116.0	103.4	105.9	103.9	115.2
2005	105.4	108.2	101.7	97.6	112.0	104.6	100.8	119.1	105.8	108.2	105.3	126.3
2006	108.9	113.1	102.2	95.8	115.2	105.9	100.6	121.7	107.1	111.1	105.9	132.8
2007	111.8	116.9	103.2	95.7	117.1	107.3	101.8	125.5	108.0	114.8	109.0	135.9
2008	115.7	122.0	104.6	93.8	119.5	108.6	102.2	127.5	109.4	118.7	110.3	149.3
2009	121.4	121.6	107.3	93.4	113.1	112.1	103.1	130.7	107.6	121.2	111.5	129.2
2010	123.1	123.3	108.8	91.6	118.0	115.1	104.0	133.1	109.2	123.7	112.9	137.8
2011	127.7	125.6	110.9	91.9	125.6	117.1	105.3	135.6	112.9	126.7	114.7	154.7
2012	130.8	127.1	113.0	82.0	128.1	118.7	105.9	137.6	114.0	129.3	116.2	157.3
2013	132.4	128.7	114.4	92.1	129.0	118.3	106.2	140.4	114.6	131.0	117.2	159.6
2014	135.5	132.2	116.6	93.2	130.4	119.0	107.4	146.6	116.5	133.7	119.0	165.3
2015	140.5	133.7	119.7	94.6	126.5	120.5	109.4	152.0	116.8	136.4	121.2	149.5
Monthly indexes												
2015												
January	139.1	133.1	118.0	91.1	122.4	120.0	105.6	149.9	114.0	134.7	119.5	139.5
February	139.5	133.1	118.9	93.3	124.3	120.1	107.9	150.3	115.3	135.5	120.3	145.1
March	139.5	133.3	119.4	96.4	126.6	119.5	108.7	150.7	117.0	135.6	121.0	149.8
April	139.4	133.1	119.7	96.2	126.6	120.1	107.7	151.4	116.7	135.6	121.0	148.1
May	140.8	133.2	119.7	95.0	128.0	120.7	109.9	151.9	117.8	136.2	121.3	152.4
June	141.0	133.5	120.0	93.0	129.6	120.5	110.6	152.1	118.0	136.5	121.3	157.5
July	140.9	133.8	120.1	93.0	129.2	120.6	111.2	152.2	117.9	136.8	121.3	159.2
August	140.8	133.9	120.4	94.0	127.8	120.5	111.7	152.6	117.5	137.1	121.5	156.1
September	140.3	133.9	120.5	96.7	125.4	120.7	112.3	152.9	116.8	137.4	121.9	149.3
October	140.9	134.3	120.6	97.7	125.8	120.7	110.8	152.9	117.1	137.4	122.2	146.6
November	141.6	134.4	119.8	96.7	126.3	121.6	108.8	153.8	117.3	136.9	121.9	146.5
December	142.5	134.5	119.6	91.7	125.6	121.0	107.9	153.5	116.3	136.8	121.3	143.4
2016												
January	144.6	134.6	120.0	90.8	125.1	121.5	107.9	154.5	116.6	137.0	121.8	139.0
February	145.0	134.7	121.0	92.1	123.7	121.5	109.6	155.2	116.5	137.7	122.3	134.6
March	144.5	134.8	121.4	96.0	125.3	121.4	110.9	156.2	117.8	138.0	123.1	138.1
April	143.8	134.9	121.6	96.0	127.8	122.2	110.3	156.5	118.6	138.0	123.3	143.4
May	143.3	135.1	122.1	96.0	129.4	122.3	111.7	156.8	118.9	138.8	123.8	146.9
June	142.8	135.6	122.4	94.1	131.0	122.2	112.0	156.7	118.1	139.1	123.9	150.6
July	143.2	136.0	122.3	92.6	128.9	122.0	113.3	157.1	118.2	139.7	123.6	147.4
August	142.3	136.2	122.2	93.6	128.2	122.7	112.9	157.3	117.9	139.6	123.6	147.0
September	140.4	136.2	121.9	96.8	128.3	122.4	113.8	157.7	117.8	139.9	124.3	147.3
October	139.9	136.9	122.1	97.5	129.6	122.8	112.4	158.1	118.3	139.9	124.5	150.2

Note(s): For information on the continuity of the series, see "Data quality, concepts and methodology — Data quality, concepts and methodology — Weights and Linking" at the end of this publication.

See "Data quality, concepts and methodology — Explanatory notes for tables" section.

The Consumer Price Index – October 2016

Table 8-1
Annual average¹ percentage changes for the Consumer Price Index — Major components, not seasonally adjusted
Canada

	CANSIM vector number	Annual average 2015	Annual average percentage change				
			2012	2013	2014	2015	
		2002=100	%				
All-items	(v41693271)	126.6	1.5	0.9	2.0	1.1	
Food	(v41693272)	140.5	2.4	1.2	2.3	3.7	
Shelter	(v41693348)	133.7	1.2	1.3	2.7	1.1	
Household operations, furnishings and equipment	(v41693365)	119.7	1.9	1.2	1.9	2.7	
Clothing and footwear	(v41693406)	94.6	0.1	0.1	1.2	1.5	
Transportation	(v41693426)	126.5	2.0	0.7	1.1	-3.0	
Health and personal care	(v41693451)	120.5	1.4	-0.3	0.6	1.3	
Recreation, education and reading	(v41693468)	109.4	0.6	0.3	1.1	1.9	
Alcoholic beverages and tobacco products	(v41693504)	152.0	1.5	2.0	4.4	3.7	
Goods	(v41693520)	116.8	1.0	0.5	1.7	0.3	
Durable goods	(v41693521)	86.8	-0.6	-0.2	0.2	1.5	
Semi-durable goods	(v41693522)	96.0	0.0	0.1	1.1	1.5	
Non-durable goods	(v41693523)	139.8	1.8	0.9	2.5	-0.7	
Services	(v41693528)	136.4	2.1	1.3	2.1	2.0	
All-items excluding food	(v41693530)	123.9	1.4	0.8	1.8	0.6	
All-items excluding food and energy	(v41693531)	121.2	1.3	0.9	1.5	1.8	
All-items excluding energy	(v41693536)	124.6	1.5	0.9	1.8	2.1	
Energy	(v41693537)	149.5	1.7	1.5	3.6	-9.6	

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

The Consumer Price Index – October 2016

Table 8-2
Annual average¹ percentage changes for the Consumer Price Index — All-items, not seasonally adjusted, Canada, provinces, cities

	CANSIM vector number	Annual average 2015	Annual average percentage change			
			2012	2013	2014	2015
			2002=100		%	
Canada	(v41693271)	126.6	1.5	0.9	2.0	1.1
Newfoundland and Labrador	(v41693542)	129.0	2.1	1.7	1.9	0.5
Prince Edward Island	(v41693677)	129.3	2.0	2.0	1.6	-0.6
Nova Scotia	(v41693811)	129.3	2.0	1.2	1.7	0.4
New Brunswick	(v41693946)	125.4	1.7	0.8	1.5	0.5
Quebec	(v41694081)	124.7	2.1	0.7	1.4	1.1
Ontario	(v41694217)	127.4	1.4	1.0	2.4	1.2
Manitoba	(v41694353)	126.8	1.6	2.2	1.9	1.2
Saskatchewan	(v41694489)	130.8	1.6	1.5	2.4	1.6
Alberta	(v41694625)	133.7	1.1	1.4	2.6	1.1
British Columbia	(v41694760)	120.2	1.1	-0.1	1.0	1.1
Whitehorse, Yukon	(v41694896)	124.1	2.3	1.7	1.3	-0.2
Yellowknife, Northwest Territories	(v41695020)	130.4	2.2	1.5	1.7	1.6
Iqaluit, Nunavut (200212=100) ²	(v41713462)	120.4	1.7	1.1	1.3	1.9
St. John's, Newfoundland and Labrador	(v41695144)	128.7	2.1	1.6	1.9	0.4
Charlottetown and Summerside, Prince Edward Island	(v41695150)	128.8	1.9	2.0	1.7	-0.4
Halifax, Nova Scotia	(v41695156)	128.2	1.7	1.1	1.8	0.5
Saint John, New Brunswick	(v41695162)	125.3	1.6	0.7	1.5	0.5
Québec, Quebec	(v41695168)	124.7	2.2	0.9	1.3	1.0
Montréal, Quebec	(v41695174)	124.9	2.0	0.8	1.5	1.4
Ottawa-Gatineau, Ontario part, Ontario/Québec	(v41695180)	126.5	1.3	1.0	2.0	1.0
Toronto, Ontario	(v41695186)	128.3	1.5	1.2	2.5	1.5
Thunder Bay, Ontario	(v41695192)	122.3	0.9	0.9	2.2	1.1
Winnipeg, Manitoba	(v41695198)	126.6	1.5	2.3	1.9	1.4
Regina, Saskatchewan	(v41695204)	131.5	1.8	1.7	2.4	1.4
Saskatoon, Saskatchewan	(v41695210)	131.0	1.5	1.0	2.3	1.9
Edmonton, Alberta	(v41695216)	133.4	1.1	1.3	2.2	1.2
Calgary, Alberta	(v41695222)	134.3	1.0	1.7	3.0	1.2
Vancouver, British Columbia	(v41695228)	121.9	1.3	0.2	1.1	1.2
Victoria, British Columbia	(v41695234)	118.6	1.0	-0.3	0.9	1.1

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

The Consumer Price Index – October 2016

Table 9-1

The Consumer Price Index, major components, selected sub-groups and special aggregates, provinces, Whitehorse and Yellowknife, not seasonally adjusted — Newfoundland and Labrador

	CANSIM vector number	Indexes			Percentage change	
		October 2015	September 2016	October 2016	September 2016 to October 2016	October 2015 to October 2016
		2002=100			%	
All-items	(v41691244)	129.7	134.5	134.9	0.3	4.0
Special aggregates						
All-items excluding food	(v41691368)	127.0	132.1	132.8	0.5	4.6
All-items excluding food and energy	(v41691369)	122.7	126.8	127.3	0.4	3.7
All-items excluding energy	(v41691374)	126.7	130.7	130.8	0.1	3.2
All-items excluding gasoline	(v41693247)	129.6	133.1	133.3	0.2	2.9
Energy ¹	(v41691375)	149.2	162.3	164.6	1.4	10.3
All-items (1992=100)	(v41713404)	152.1	157.7	158.2	0.3	4.0
Food	(v41691245)	143.4	146.5	144.9	-1.1	1.0
Food purchased from stores	(v41691246)	142.6	144.8	142.7	-1.5	0.1
Meat	(v41691247)	157.7	157.2	153.1	-2.6	-2.9
Dairy products	(v41691257)	133.4	131.3	128.6	-2.1	-3.6
Bakery and cereal products (excluding baby food)	(v41691262)	176.0	176.6	176.2	-0.2	0.1
Fresh fruit	(v41691266)	129.9	132.9	137.2	3.2	5.6
Fresh vegetables	(v41691269)	100.4	109.3	103.4	-5.4	3.0
Food purchased from restaurants	(v41691276)	147.3	154.3	154.3	0.0	4.8
Shelter	(v41691277)	151.4	152.7	154.6	1.2	2.1
Rented accommodation	(v41691278)	126.7	127.4	127.7	0.2	0.8
Owned accommodation	(v41691280)	148.9	153.8	156.4	1.7	5.0
Homeowners' replacement cost	(v41691281)	185.6	187.9	188.6	0.4	1.6
Homeowners' home and mortgage insurance	(v41691283)	162.3	191.7	191.7	0.0	18.1
Homeowners' maintenance and repairs	(v41691284)	164.2	173.2	173.5	0.2	5.7
Water, fuel and electricity	(v41691285)	167.2	159.8	161.3	0.9	-3.5
Electricity	(v41691286)	154.6	146.5	146.5	0.0	-5.2
Natural gas						
Fuel oil and other fuels	(v41691288)	176.7	172.3	180.0	4.5	1.9
Household operations, furnishings and equipment	(v41691289)	117.6	124.1	125.2	0.9	6.5
Household operations	(v41691290)	133.7	140.7	142.8	1.5	6.8
Telephone services	(v41691292)	126.4	140.4	141.7	0.9	12.1
Internet access services (200212=100)	(v41693217)	128.0	128.2	140.0	9.2	9.4
Household furnishings and equipment	(v41691297)	92.2	97.9	97.5	-0.4	5.7
Clothing and footwear	(v41691304)	101.9	99.5	98.7	-0.8	-3.1
Women's clothing	(v41691306)	93.6	91.1	89.1	-2.2	-4.8
Men's clothing	(v41691307)	100.8	101.0	100.3	-0.7	-0.5
Footwear	(v41691309)	100.2	98.4	97.9	-0.5	-2.3
Transportation	(v41691312)	122.4	133.7	134.2	0.4	9.6
Private transportation	(v41691313)	121.5	133.4	134.1	0.5	10.4
Purchase and leasing of passenger vehicles	(v41691315)	96.9	102.0	102.3	0.3	5.6
Gasoline	(v41691318)	134.8	166.1	169.1	1.8	25.4
Passenger vehicle insurance premiums	(v41691321)	147.3	150.8	150.8	0.0	2.4
Public transportation	(v41691323)	131.4	137.6	136.3	-0.9	3.7
Health and personal care	(v41691328)	115.5	117.9	119.1	1.0	3.1
Health care	(v41691329)	112.8	115.2	114.9	-0.3	1.9
Personal care	(v41691335)	119.6	122.0	125.1	2.5	4.6
Recreation, education and reading	(v41691338)	106.8	109.4	109.3	-0.1	2.3
Recreation	(v41691339)	104.8	107.2	107.0	-0.2	2.1
Education and reading	(v41691347)	116.7	120.9	121.0	0.1	3.7
Alcoholic beverages and tobacco products	(v41691351)	159.7	170.2	169.7	-0.3	6.3
Alcoholic beverages	(v41691352)	128.1	135.0	134.6	-0.3	5.1
Tobacco products and smokers' supplies	(v41691358)	187.4	201.4	200.9	-0.2	7.2

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

The Consumer Price Index – October 2016

Table 9-2

The Consumer Price Index, major components, selected sub-groups and special aggregates, provinces, Whitehorse and Yellowknife, not seasonally adjusted — Prince Edward Island

	CANSIM vector number	Indexes			Percentage change	
		October 2015	September 2016	October 2016	September 2016 to October 2016	October 2015 to October 2016
		2002=100			%	
All-items	(v41691379)	129.4	130.6	131.9	1.0	1.9
Special aggregates						
All-items excluding food	(v41691502)	125.9	127.5	128.9	1.1	2.4
All-items excluding food and energy	(v41691503)	119.9	122.1	122.9	0.7	2.5
All-items excluding energy	(v41691508)	125.1	126.8	127.6	0.6	2.0
All-items excluding gasoline	(v41693249)	128.3	129.5	130.6	0.8	1.8
Energy ¹	(v41691509)	162.0	158.1	164.7	4.2	1.7
All-items (1992=100)	(v41713406)	152.3	153.7	155.2	1.0	1.9
Food	(v41691380)	147.5	146.5	147.3	0.5	-0.1
Food purchased from stores	(v41691381)	150.5	148.6	149.2	0.4	-0.9
Meat	(v41691382)	169.2	154.0	160.1	4.0	-5.4
Dairy products	(v41691392)	146.9	147.3	147.0	-0.2	0.1
Bakery and cereal products (excluding baby food)	(v41691397)	183.8	182.9	181.5	-0.8	-1.3
Fresh fruit	(v41691401)	114.0	120.0	115.8	-3.5	1.6
Fresh vegetables	(v41691404)	129.0	130.8	122.8	-6.1	-4.8
Food purchased from restaurants	(v41691411)	137.7	140.3	141.5	0.9	2.8
Shelter	(v41691412)	131.8	130.7	132.5	1.4	0.5
Rented accommodation	(v41691413)	116.4	116.5	116.9	0.3	0.4
Owned accommodation	(v41691415)	117.9	118.7	119.5	0.7	1.4
Homeowners' replacement cost	(v41691416)	120.1	121.2	122.4	1.0	1.9
Homeowners' home and mortgage insurance	(v41691418)	162.6	167.1	167.1	0.0	2.8
Homeowners' maintenance and repairs	(v41691419)	137.8	144.1	151.2	4.9	9.7
Water, fuel and electricity	(v41691420)	174.4	167.2	172.9	3.4	-0.9
Electricity	(v41691421)	153.6	157.3	158.7	0.9	3.3
Natural gas						
Fuel oil and other fuels	(v41691423)	184.3	162.0	173.7	7.2	-5.8
Household operations, furnishings and equipment	(v41691424)	124.8	129.1	130.4	1.0	4.5
Household operations	(v41691425)	136.9	141.0	143.1	1.5	4.5
Telephone services	(v41691427)	119.4	125.3	127.3	1.6	6.6
Internet access services (200212=100)	(v41693218)	133.6	135.7	139.9	3.1	4.7
Household furnishings and equipment	(v41691432)	99.2	104.3	103.6	-0.7	4.4
Clothing and footwear	(v41691439)	104.0	104.4	104.0	-0.4	0.0
Women's clothing	(v41691441)	92.1	96.3	97.4	1.1	5.8
Men's clothing	(v41691442)	99.4	98.4	94.9	-3.6	-4.5
Footwear	(v41691444)	115.3	114.0	115.1	1.0	-0.2
Transportation	(v41691447)	124.0	126.5	129.0	2.0	4.0
Private transportation	(v41691448)	123.4	125.7	128.5	2.2	4.1
Purchase and leasing of passenger vehicles	(v41691450)	93.4	96.7	98.0	1.3	4.9
Gasoline	(v41691453)	149.8	149.8	156.9	4.7	4.7
Passenger vehicle insurance premiums	(v41691456)	142.2	144.8	145.3	0.3	2.2
Public transportation	(v41691458)	135.1	140.5	139.9	-0.4	3.6
Health and personal care	(v41691462)	116.8	120.7	121.4	0.6	3.9
Health care	(v41691463)	112.5	115.7	115.9	0.2	3.0
Personal care	(v41691469)	123.0	127.9	129.8	1.5	5.5
Recreation, education and reading	(v41691472)	112.4	113.9	113.8	-0.1	1.2
Recreation	(v41691473)	100.8	101.1	101.0	-0.1	0.2
Education and reading	(v41691481)	146.9	153.2	153.1	-0.1	4.2
Alcoholic beverages and tobacco products	(v41691485)	186.9	188.2	190.6	1.3	2.0
Alcoholic beverages	(v41691486)	133.1	133.5	136.0	1.9	2.2
Tobacco products and smokers' supplies	(v41691492)	219.8	221.8	223.9	0.9	1.9

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

The Consumer Price Index – October 2016

Table 9-3

The Consumer Price Index, major components, selected sub-groups and special aggregates, provinces, Whitehorse and Yellowknife, not seasonally adjusted — Nova Scotia

	CANSIM vector number	Indexes			Percentage change	
		October 2015	September 2016	October 2016	September 2016 to October 2016	October 2015 to October 2016
		2002=100			%	
All-items	(v41691513)	129.8	131.6	131.6	0.0	1.4
Special aggregates						
All-items excluding food	(v41691637)	126.3	128.0	128.2	0.2	1.5
All-items excluding food and energy	(v41691638)	121.9	123.9	123.8	-0.1	1.6
All-items excluding energy	(v41691643)	126.8	128.7	128.5	-0.2	1.3
All-items excluding gasoline	(v41693251)	129.3	130.9	130.7	-0.2	1.1
Energy ¹	(v41691644)	150.4	150.2	152.1	1.3	1.1
All-items (1992=100)	(v41713408)	155.5	157.6	157.6	0.0	1.4
Food	(v41691514)	148.0	150.0	148.7	-0.9	0.5
Food purchased from stores	(v41691515)	148.3	149.8	147.8	-1.3	-0.3
Meat	(v41691516)	160.8	161.9	160.4	-0.9	-0.2
Dairy products	(v41691526)	132.8	135.4	135.1	-0.2	1.7
Bakery and cereal products (excluding baby food)	(v41691531)	178.1	173.9	175.2	0.7	-1.6
Fresh fruit	(v41691535)	122.1	119.9	118.3	-1.3	-3.1
Fresh vegetables	(v41691538)	120.8	131.9	113.5	-13.9	-6.0
Food purchased from restaurants	(v41691545)	147.4	151.0	151.7	0.5	2.9
Shelter	(v41691546)	139.8	139.3	139.6	0.2	-0.1
Rented accommodation	(v41691547)	114.4	115.3	115.3	0.0	0.8
Owned accommodation	(v41691549)	136.0	136.5	136.9	0.3	0.7
Homeowners' replacement cost	(v41691550)	146.2	146.7	146.5	-0.1	0.2
Homeowners' home and mortgage insurance	(v41691552)	245.9	253.1	253.1	0.0	2.9
Homeowners' maintenance and repairs	(v41691553)	136.6	137.2	139.3	1.5	2.0
Water, fuel and electricity	(v41691554)	169.2	164.7	164.6	-0.1	-2.7
Electricity	(v41691555)	153.1	151.7	151.7	0.0	-0.9
Natural gas						
Fuel oil and other fuels	(v41691557)	180.5	166.2	166.1	-0.1	-8.0
Household operations, furnishings and equipment	(v41691558)	121.2	122.7	123.0	0.2	1.5
Household operations	(v41691559)	136.8	139.2	139.0	-0.1	1.6
Telephone services	(v41691561)	122.3	125.5	126.5	0.8	3.4
Internet access services (200212=100)	(v41693219)	133.2	131.6	126.1	-4.2	-5.3
Household furnishings and equipment	(v41691566)	90.5	90.4	91.6	1.3	1.2
Clothing and footwear	(v41691573)	107.0	100.5	100.8	0.3	-5.8
Women's clothing	(v41691575)	102.2	100.8	100.6	-0.2	-1.6
Men's clothing	(v41691576)	97.4	95.7	95.6	-0.1	-1.8
Footwear	(v41691578)	110.1	89.2	90.7	1.7	-17.6
Transportation	(v41691581)	118.9	123.2	124.1	0.7	4.4
Private transportation	(v41691582)	117.9	122.0	123.2	1.0	4.5
Purchase and leasing of passenger vehicles	(v41691584)	95.9	99.7	100.3	0.6	4.6
Gasoline	(v41691587)	133.1	138.6	142.5	2.8	7.1
Passenger vehicle insurance premiums	(v41691590)	116.1	120.3	120.3	0.0	3.6
Public transportation	(v41691592)	131.7	137.3	136.0	-0.9	3.3
Health and personal care	(v41691597)	117.7	119.7	120.5	0.7	2.4
Health care	(v41691598)	115.4	117.9	117.6	-0.3	1.9
Personal care	(v41691604)	120.7	121.8	124.3	2.1	3.0
Recreation, education and reading	(v41691607)	112.5	118.0	116.2	-1.5	3.3
Recreation	(v41691608)	103.8	109.1	106.8	-2.1	2.9
Education and reading	(v41691616)	139.0	145.3	145.5	0.1	4.7
Alcoholic beverages and tobacco products	(v41691620)	181.7	189.3	189.3	0.0	4.2
Alcoholic beverages	(v41691621)	132.5	134.2	133.8	-0.3	1.0
Tobacco products and smokers' supplies	(v41691627)	221.9	235.8	236.2	0.2	6.4

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

The Consumer Price Index – October 2016

Table 9-4
The Consumer Price Index, major components, selected sub-groups and special aggregates, provinces, Whitehorse and Yellowknife, not seasonally adjusted — New Brunswick

	CANSIM vector number	Indexes			Percentage change	
		October 2015	September 2016	October 2016	September 2016 to October 2016	October 2015 to October 2016
		2002=100			%	
All-items	(v41691648)	125.9	129.4	129.4	0.0	2.8
Special aggregates						
All-items excluding food	(v41691772)	121.5	125.5	125.7	0.2	3.5
All-items excluding food and energy	(v41691773)	117.8	121.7	121.5	-0.2	3.1
All-items excluding energy	(v41691778)	123.5	126.9	126.5	-0.3	2.4
All-items excluding gasoline	(v41693253)	125.3	128.7	128.5	-0.2	2.6
All-items excluding gasoline Energy ¹	(v41691779)	141.3	146.0	149.0	2.1	5.4
All-items (1992=100)	(v41713410)	149.3	153.5	153.5	0.0	2.8
Food	(v41691649)	148.6	149.2	148.0	-0.8	-0.4
Food purchased from stores	(v41691650)	151.2	150.2	148.4	-1.2	-1.9
Meat	(v41691651)	173.5	168.6	168.3	-0.2	-3.0
Dairy products	(v41691661)	132.2	133.7	134.1	0.3	1.4
Bakery and cereal products (excluding baby food)	(v41691666)	178.8	171.9	171.5	-0.2	-4.1
Fresh fruit	(v41691670)	126.7	123.1	123.6	0.4	-2.4
Fresh vegetables	(v41691673)	127.3	121.7	111.8	-8.1	-12.2
Food purchased from restaurants	(v41691680)	142.3	147.3	147.5	0.1	3.7
Shelter	(v41691681)	130.2	132.3	133.4	0.8	2.5
Rented accommodation	(v41691682)	113.7	114.7	114.8	0.1	1.0
Owned accommodation	(v41691684)	123.4	125.5	126.5	0.8	2.5
Homeowners' replacement cost	(v41691685)	120.8	123.1	124.9	1.5	3.4
Homeowners' home and mortgage insurance	(v41691687)	205.4	222.2	222.2	0.0	8.2
Homeowners' maintenance and repairs	(v41691688)	133.9	139.3	141.6	1.7	5.8
Water, fuel and electricity	(v41691689)	155.3	158.5	160.6	1.3	3.4
Electricity	(v41691690)	140.5	145.4	145.4	0.0	3.5
Natural gas						
Fuel oil and other fuels	(v41691692)	179.9	164.2	184.2	12.2	2.4
Household operations, furnishings and equipment	(v41691693)	121.4	125.2	125.5	0.2	3.4
Household operations	(v41691694)	137.6	141.9	143.5	1.1	4.3
Telephone services	(v41691696)	133.3	137.7	138.6	0.7	4.0
Internet access services (2002=100)	(v41693220)	122.1	126.9	138.0	8.7	13.0
Household furnishings and equipment	(v41691701)	92.0	94.8	93.2	-1.7	1.3
Clothing and footwear	(v41691708)	100.7	102.2	101.7	-0.5	1.0
Women's clothing	(v41691710)	87.4	88.6	87.9	-0.8	0.6
Men's clothing	(v41691711)	98.0	100.1	99.1	-1.0	1.1
Footwear	(v41691713)	98.2	101.5	101.0	-0.5	2.9
Transportation	(v41691716)	117.6	123.6	124.5	0.7	5.9
Private transportation	(v41691717)	117.1	123.1	124.0	0.7	5.9
Purchase and leasing of passenger vehicles	(v41691719)	93.2	98.3	98.4	0.1	5.6
Gasoline	(v41691722)	131.3	138.0	141.8	2.8	8.0
Passenger vehicle insurance premiums	(v41691725)	123.4	131.6	131.6	0.0	6.6
Public transportation	(v41691727)	131.0	137.2	136.2	-0.7	4.0
Health and personal care	(v41691732)	111.6	114.7	113.7	-0.9	1.9
Health care	(v41691733)	112.0	114.6	113.9	-0.6	1.7
Personal care	(v41691739)	112.0	115.9	114.4	-1.3	2.1
Recreation, education and reading	(v41691742)	111.8	115.4	113.9	-1.3	1.9
Recreation	(v41691743)	102.2	105.5	103.7	-1.7	1.5
Education and reading	(v41691751)	148.0	152.3	152.3	0.0	2.9
Alcoholic beverages and tobacco products	(v41691755)	168.4	183.8	182.5	-0.7	8.4
Alcoholic beverages	(v41691756)	133.3	136.4	133.8	-1.9	0.4
Tobacco products and smokers' supplies	(v41691762)	195.3	223.1	223.4	0.1	14.4

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

The Consumer Price Index – October 2016

Table 9-5

The Consumer Price Index, major components, selected sub-groups and special aggregates, provinces, Whitehorse and Yellowknife, not seasonally adjusted — Quebec

	CANSIM vector number	Indexes			Percentage change	
		October 2015	September 2016	October 2016	September 2016 to October 2016	October 2015 to October 2016
		2002=100			%	
All-items	(v41691783)	125.2	125.8	125.9	0.1	0.6
Special aggregates						
All-items excluding food	(v41691908)	121.4	122.2	122.5	0.2	0.9
All-items excluding food and energy	(v41691909)	118.7	119.7	119.7	0.0	0.8
All-items excluding energy	(v41691914)	123.4	124.1	124.0	-0.1	0.5
All-items excluding gasoline	(v41693255)	124.0	124.7	124.6	-0.1	0.5
All-items excluding gasoline Energy ¹	(v41691915)	140.6	139.2	142.5	2.4	1.4
All-items (1992=100)	(v41713412)	144.6	145.3	145.4	0.1	0.6
Food	(v41691784)	142.1	141.6	140.8	-0.6	-0.9
Food purchased from stores	(v41691785)	141.3	139.4	138.2	-0.9	-2.2
Meat	(v41691786)	166.2	162.2	161.7	-0.3	-2.7
Dairy products	(v41691796)	133.6	130.8	129.9	-0.7	-2.8
Bakery and cereal products (excluding baby food)	(v41691801)	150.9	147.7	145.6	-1.4	-3.5
Fresh fruit	(v41691805)	131.4	127.7	123.5	-3.3	-6.0
Fresh vegetables	(v41691808)	115.3	110.8	114.2	3.1	-1.0
Food purchased from restaurants	(v41691815)	143.8	147.0	147.2	0.1	2.4
Shelter	(v41691816)	129.0	129.8	130.5	0.5	1.2
Rented accommodation	(v41691817)	116.8	117.7	117.8	0.1	0.9
Owned accommodation	(v41691819)	133.6	134.7	135.7	0.7	1.6
Homeowners' replacement cost	(v41691820)	151.5	152.9	153.5	0.4	1.3
Homeowners' home and mortgage insurance	(v41691822)	147.8	157.1	157.1	0.0	6.3
Homeowners' maintenance and repairs	(v41691823)	138.4	140.5	142.6	1.5	3.0
Water, fuel and electricity	(v41691824)	133.2	132.8	133.5	0.5	0.2
Electricity	(v41691825)	122.9	123.6	123.6	0.0	0.6
Natural gas	(v41691827)	109.0	106.2	107.2	0.9	-1.7
Fuel oil and other fuels	(v41691828)	184.2	168.4	179.3	6.5	-2.7
Household operations, furnishings and equipment	(v41691829)	122.5	122.4	121.6	-0.7	-0.7
Household operations	(v41691830)	135.5	134.3	133.7	-0.4	-1.3
Telephone services	(v41691832)	136.5	129.0	130.9	1.5	-4.1
Internet access services (2002=100)	(v41693221)	106.9	105.0	95.6	-9.0	-10.6
Household furnishings and equipment	(v41691837)	101.7	103.7	102.4	-1.3	0.7
Clothing and footwear	(v41691844)	95.7	94.8	95.0	0.2	-0.7
Women's clothing	(v41691846)	80.6	80.2	80.1	-0.1	-0.6
Men's clothing	(v41691847)	95.1	95.6	95.1	-0.5	0.0
Footwear	(v41691849)	99.7	96.2	98.4	2.3	-1.3
Transportation	(v41691852)	125.3	126.4	127.7	1.0	1.9
Private transportation	(v41691853)	124.0	124.8	126.3	1.2	1.9
Purchase and leasing of passenger vehicles	(v41691855)	95.3	98.8	99.3	0.5	4.2
Gasoline	(v41691858)	148.5	146.2	151.9	3.9	2.3
Passenger vehicle insurance premiums	(v41691861)	172.1	160.1	159.6	-0.3	-7.3
Public transportation	(v41691863)	143.3	147.9	147.0	-0.6	2.6
Health and personal care	(v41691868)	121.1	122.4	122.7	0.2	1.3
Health care	(v41691869)	122.0	123.7	123.6	-0.1	1.3
Personal care	(v41691875)	119.8	120.7	121.8	0.9	1.7
Recreation, education and reading	(v41691878)	100.6	102.1	101.3	-0.8	0.7
Recreation	(v41691879)	91.1	92.5	91.5	-1.1	0.4
Education and reading	(v41691887)	142.6	144.6	144.8	0.1	1.5
Alcoholic beverages and tobacco products	(v41691891)	147.7	149.5	150.2	0.5	1.7
Alcoholic beverages	(v41691892)	118.8	119.2	119.9	0.6	0.9
Tobacco products and smokers' supplies	(v41691898)	185.3	190.5	190.8	0.2	3.0

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

The Consumer Price Index – October 2016

Table 9-6
The Consumer Price Index, major components, selected sub-groups and special aggregates, provinces, Whitehorse and Yellowknife, not seasonally adjusted — Ontario

	CANSIM vector number	Indexes			Percentage change	
		October 2015	September 2016	October 2016	September 2016 to October 2016	October 2015 to October 2016
		2002=100			%	
All-items	(v41691919)	127.9	130.1	130.6	0.4	2.1
Special aggregates						
All-items excluding food	(v41692044)	125.6	128.3	128.7	0.3	2.5
All-items excluding food and energy	(v41692045)	123.7	126.1	126.4	0.2	2.2
All-items excluding energy	(v41692050)	126.6	128.5	128.8	0.2	1.7
All-items excluding gasoline	(v41693257)	127.2	129.5	129.7	0.2	2.0
Energy ¹	(v41692051)	149.4	155.4	157.8	1.5	5.6
All-items (1992=100)	(v41713415)	153.7	156.3	156.8	0.3	2.0
Food						
Food purchased from stores	(v41691920)	141.3	140.5	140.8	0.2	-0.4
Meat	(v41691921)	142.9	140.7	141.0	0.2	-1.3
Dairy products	(v41691922)	158.2	157.7	158.0	0.2	-0.1
Bakery and cereal products (excluding baby food)	(v41691932)	135.5	131.4	133.4	1.5	-1.5
Fresh fruit	(v41691937)	161.0	155.9	158.0	1.3	-1.9
Fresh vegetables	(v41691941)	128.7	118.5	116.4	-1.8	-9.6
Food purchased from restaurants	(v41691944)	119.5	116.3	117.7	1.2	-1.5
Shelter	(v41691951)	137.6	140.4	140.8	0.3	2.3
Rented accommodation	(v41691952)	135.0	138.9	139.5	0.4	3.3
Owned accommodation	(v41691953)	116.5	117.6	117.7	0.1	1.0
Homeowners' replacement cost	(v41691955)	137.4	140.6	141.6	0.7	3.1
Homeowners' home and mortgage insurance	(v41691956)	165.3	175.8	176.1	0.2	6.5
Homeowners' maintenance and repairs	(v41691958)	231.8	233.9	234.7	0.3	1.3
Water, fuel and electricity	(v41691959)	133.5	135.6	137.0	1.0	2.6
Electricity	(v41691960)	162.7	174.8	174.0	-0.5	6.9
Natural gas	(v41691961)	167.9	193.5	193.5	0.0	15.2
Fuel oil and other fuels	(v41691963)	101.6	98.2	95.9	-2.3	-5.6
Household operations, furnishings and equipment	(v41691964)	200.4	182.7	190.3	4.2	-5.0
Household operations	(v41691965)	122.3	123.7	124.1	0.3	1.5
Telephone services	(v41691966)	137.7	138.7	139.3	0.4	1.2
Internet access services (200212=100)	(v41691968)	132.2	131.2	131.9	0.5	-0.2
Household furnishings and equipment	(v41693222)	122.2	120.6	120.8	0.2	-1.1
Clothing and footwear	(v41691973)	95.4	97.6	97.5	-0.1	2.2
Women's clothing	(v41691980)	94.9	94.3	95.3	1.1	0.4
Men's clothing	(v41691982)	82.4	81.4	83.0	2.0	0.7
Footwear	(v41691983)	96.3	94.9	96.9	2.1	0.6
Transportation	(v41691985)	87.8	89.6	88.6	-1.1	0.9
Private transportation	(v41691988)	125.6	128.3	129.9	1.2	3.4
Purchase and leasing of passenger vehicles	(v41691989)	124.3	126.7	128.7	1.6	3.5
Gasoline	(v41691991)	94.3	98.1	98.5	0.4	4.5
Passenger vehicle insurance premiums	(v41691994)	145.7	145.7	151.6	4.0	4.0
Public transportation	(v41691997)	170.9	168.5	172.3	2.3	0.8
Health and personal care	(v41691999)	136.0	140.9	139.9	-0.7	2.9
Health care	(v41692004)	122.1	123.9	124.0	0.1	1.6
Personal care	(v41692005)	124.2	127.0	126.5	-0.4	1.9
Recreation, education and reading	(v41692011)	120.3	121.1	121.9	0.7	1.3
Recreation	(v41692014)	114.0	117.1	115.4	-1.5	1.2
Education and reading	(v41692015)	98.2	100.5	98.2	-2.3	0.0
Alcoholic beverages and tobacco products	(v41692023)	158.3	163.7	163.9	0.1	3.5
Alcoholic beverages	(v41692027)	155.5	161.5	161.7	0.1	4.0
Tobacco products and smokers' supplies	(v41692028)	121.2	123.1	122.9	-0.2	1.4
	(v41692034)	198.0	211.9	213.0	0.5	7.6

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

The Consumer Price Index – October 2016

Table 9-7
 The Consumer Price Index, major components, selected sub-groups and special aggregates, provinces, Whitehorse and Yellowknife, not seasonally adjusted — Manitoba

	CANSIM vector number	Indexes			Percentage change	
		October 2015	September 2016	October 2016	September 2016 to October 2016	October 2015 to October 2016
		2002=100			%	
All-items	(v41692055)	128.0	129.0	129.4	0.3	1.1
Special aggregates						
All-items excluding food	(v41692180)	125.3	126.9	127.5	0.5	1.8
All-items excluding food and energy	(v41692181)	123.3	125.5	125.9	0.3	2.1
All-items excluding energy	(v41692186)	126.6	128.2	128.4	0.2	1.4
All-items excluding gasoline	(v41693259)	126.7	128.3	128.4	0.1	1.3
Energy ¹	(v41692187)	142.9	137.2	140.5	2.4	-1.7
All-items (1992=100)	(v41713419)	157.5	158.8	159.3	0.3	1.1
Food	(v41692056)	141.5	139.6	138.7	-0.6	-2.0
Food purchased from stores	(v41692057)	138.8	135.0	133.6	-1.0	-3.7
Meat	(v41692058)	148.3	150.2	148.0	-1.5	-0.2
Dairy products	(v41692068)	138.2	134.0	134.4	0.3	-2.7
Bakery and cereal products (excluding baby food)	(v41692073)	151.4	145.2	144.7	-0.3	-4.4
Fresh fruit	(v41692077)	128.5	123.3	122.5	-0.6	-4.7
Fresh vegetables	(v41692080)	126.2	123.4	115.4	-6.5	-8.6
Food purchased from restaurants	(v41692087)	146.6	149.5	150.0	0.3	2.3
Shelter	(v41692088)	139.3	141.6	142.4	0.6	2.2
Rented accommodation	(v41692089)	127.0	128.1	128.3	0.2	1.0
Owned accommodation	(v41692091)	145.7	147.5	148.7	0.8	2.1
Homeowners' replacement cost	(v41692092)	183.0	187.1	187.8	0.4	2.6
Homeowners' home and mortgage insurance	(v41692094)	174.0	178.7	178.7	0.0	2.7
Homeowners' maintenance and repairs	(v41692095)	139.6	140.8	140.8	0.0	0.9
Water, fuel and electricity	(v41692096)	132.0	137.4	137.6	0.1	4.2
Electricity	(v41692097)	140.8	145.5	145.5	0.0	3.3
Natural gas	(v41692099)	89.8	89.5	89.5	0.0	-0.3
Fuel oil and other fuels	(v41692100)	187.2	171.1	184.4	7.8	-1.5
Household operations, furnishings and equipment	(v41692101)	120.0	121.3	121.0	-0.2	0.8
Household operations	(v41692102)	130.3	131.2	131.0	-0.2	0.5
Telephone services	(v41692104)	117.2	120.1	118.8	-1.1	1.4
Internet access services (2002=100)	(v41693223)	148.7	159.7	158.9	-0.5	6.9
Household furnishings and equipment	(v41692109)	101.4	103.4	102.8	-0.6	1.4
Clothing and footwear	(v41692116)	97.5	96.4	95.8	-0.6	-1.7
Women's clothing	(v41692118)	86.9	85.2	84.3	-1.1	-3.0
Men's clothing	(v41692119)	90.9	90.2	89.5	-0.8	-1.5
Footwear	(v41692121)	95.1	94.7	94.8	0.1	-0.3
Transportation	(v41692124)	125.0	126.9	127.7	0.6	2.2
Private transportation	(v41692125)	124.6	126.1	127.1	0.8	2.0
Purchase and leasing of passenger vehicles	(v41692127)	99.1	103.2	103.1	-0.1	4.0
Gasoline	(v41692130)	159.3	145.1	151.5	4.4	-4.9
Passenger vehicle insurance premiums	(v41692133)	123.0	126.8	126.8	0.0	3.1
Public transportation	(v41692135)	130.4	136.2	134.9	-1.0	3.5
Health and personal care	(v41692140)	114.5	115.1	116.2	1.0	1.5
Health care	(v41692141)	116.0	118.4	118.1	-0.3	1.8
Personal care	(v41692147)	113.6	111.7	114.6	2.6	0.9
Recreation, education and reading	(v41692150)	110.1	111.8	113.4	1.4	3.0
Recreation	(v41692151)	103.0	104.1	106.1	1.9	3.0
Education and reading	(v41692159)	137.6	141.4	141.7	0.2	3.0
Alcoholic beverages and tobacco products	(v41692163)	173.3	175.8	175.6	-0.1	1.3
Alcoholic beverages	(v41692164)	143.0	145.9	144.2	-1.2	0.8
Tobacco products and smokers' supplies	(v41692170)	201.0	203.0	204.4	0.7	1.7

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

The Consumer Price Index – October 2016

Table 9-8
The Consumer Price Index, major components, selected sub-groups and special aggregates, provinces, Whitehorse and Yellowknife, not seasonally adjusted — Saskatchewan

	CANSIM vector number	Indexes			Percentage change	
		October 2015	September 2016	October 2016	September 2016 to October 2016	October 2015 to October 2016
		2002=100			%	
All-items	(v41692191)	131.7	132.4	132.7	0.2	0.8
Special aggregates						
All-items excluding food	(v41692316)	129.5	130.5	131.1	0.5	1.2
All-items excluding food and energy	(v41692317)	127.9	129.5	130.1	0.5	1.7
All-items excluding energy	(v41692322)	130.7	131.9	132.2	0.2	1.1
All-items excluding gasoline	(v41693261)	131.0	132.2	132.4	0.2	1.1
Energy ¹	(v41692323)	139.9	135.3	136.1	0.6	-2.7
All-items (1992=100)	(v41713421)	162.9	163.7	164.1	0.2	0.7
Food	(v41692192)	143.8	142.3	140.9	-1.0	-2.0
Food purchased from stores	(v41692193)	143.5	140.7	138.6	-1.5	-3.4
Meat	(v41692194)	159.4	155.9	156.0	0.1	-2.1
Dairy products	(v41692204)	145.4	139.7	138.6	-0.8	-4.7
Bakery and cereal products (excluding baby food)	(v41692209)	152.0	148.5	148.1	-0.3	-2.6
Fresh fruit	(v41692213)	146.6	142.3	139.3	-2.1	-5.0
Fresh vegetables	(v41692216)	145.6	143.9	137.6	-4.4	-5.5
Food purchased from restaurants	(v41692223)	144.1	146.0	146.4	0.3	1.6
Shelter	(v41692224)	160.4	160.6	161.2	0.4	0.5
Rented accommodation	(v41692225)	142.3	141.4	141.4	0.0	-0.6
Owned accommodation	(v41692227)	170.7	169.8	170.8	0.6	0.1
Homeowners' replacement cost	(v41692228)	227.8	221.8	221.8	0.0	-2.6
Homeowners' home and mortgage insurance	(v41692230)	270.9	273.9	273.9	0.0	1.1
Homeowners' maintenance and repairs	(v41692231)	143.3	146.0	146.0	0.0	1.9
Water, fuel and electricity	(v41692232)	152.3	156.1	156.5	0.3	2.8
Electricity	(v41692233)	154.9	162.7	162.7	0.0	5.0
Natural gas	(v41692235)	106.0	100.0	100.0	0.0	-5.7
Fuel oil and other fuels	(v41692236)	184.5	167.5	186.0	11.0	0.8
Household operations, furnishings and equipment	(v41692237)	112.2	114.7	115.2	0.4	2.7
Household operations	(v41692238)	123.5	124.0	124.8	0.6	1.1
Telephone services	(v41692240)	100.0	101.4	101.5	0.1	1.5
Internet access services (2002=100)	(v41693224)	115.1	121.7	122.5	0.7	6.4
Household furnishings and equipment	(v41692245)	92.4	98.1	98.3	0.2	6.4
Clothing and footwear	(v41692252)	99.7	100.9	101.2	0.3	1.5
Women's clothing	(v41692254)	87.9	88.6	88.8	0.2	1.0
Men's clothing	(v41692255)	90.7	92.4	93.8	1.5	3.4
Footwear	(v41692257)	101.1	102.7	101.8	-0.9	0.7
Transportation	(v41692260)	121.4	122.4	123.1	0.6	1.4
Private transportation	(v41692261)	120.6	121.2	122.0	0.7	1.2
Purchase and leasing of passenger vehicles	(v41692263)	97.0	100.2	101.0	0.8	4.1
Gasoline	(v41692266)	146.5	135.7	136.9	0.9	-6.6
Passenger vehicle insurance premiums	(v41692269)	137.9	138.9	138.9	0.0	0.7
Public transportation	(v41692271)	132.6	139.4	137.9	-1.1	4.0
Health and personal care	(v41692276)	120.1	121.4	122.0	0.5	1.6
Health care	(v41692277)	118.6	119.5	119.3	-0.2	0.6
Personal care	(v41692283)	122.3	124.2	126.0	1.4	3.0
Recreation, education and reading	(v41692286)	112.5	112.1	112.7	0.5	0.2
Recreation	(v41692287)	103.0	101.5	102.1	0.6	-0.9
Education and reading	(v41692295)	151.8	158.2	158.2	0.0	4.2
Alcoholic beverages and tobacco products	(v41692299)	163.0	167.1	167.8	0.4	2.9
Alcoholic beverages	(v41692300)	142.1	146.3	146.6	0.2	3.2
Tobacco products and smokers' supplies	(v41692306)	176.1	180.1	181.1	0.6	2.8

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

The Consumer Price Index – October 2016

Table 9-9

The Consumer Price Index, major components, selected sub-groups and special aggregates, provinces, Whitehorse and Yellowknife, not seasonally adjusted — Alberta

	CANSIM vector number	Indexes			Percentage change	
		October 2015	September 2016	October 2016	September 2016 to October 2016	October 2015 to October 2016
		2002=100			%	
All-items	(v41692327)	135.1	135.3	135.8	0.4	0.5
Special aggregates						
All-items excluding food	(v41692451)	134.3	134.6	135.4	0.6	0.8
All-items excluding food and energy	(v41692452)	132.2	133.6	134.2	0.4	1.5
All-items excluding energy	(v41692457)	133.5	134.6	134.9	0.2	1.0
All-items excluding gasoline	(v41693263)	134.4	135.2	135.5	0.2	0.8
Energy ¹	(v41692458)	152.9	139.0	142.9	2.8	-6.5
All-items (1992=100)	(v41713424)	167.8	168.0	168.7	0.4	0.5
Food	(v41692328)	140.1	139.6	138.4	-0.9	-1.2
Food purchased from stores	(v41692329)	139.5	136.5	134.4	-1.5	-3.7
Meat	(v41692330)	156.5	151.7	153.0	0.9	-2.2
Dairy products	(v41692340)	141.9	138.5	136.3	-1.9	-3.9
Bakery and cereal products (excluding baby food)	(v41692345)	149.6	147.3	148.2	0.6	-0.9
Fresh fruit	(v41692349)	137.5	131.4	126.5	-3.7	-8.0
Fresh vegetables	(v41692352)	117.4	116.8	108.8	-6.8	-7.3
Food purchased from restaurants	(v41692359)	141.2	145.6	146.2	0.4	3.5
Shelter	(v41692360)	164.2	162.3	163.3	0.6	-0.5
Rented accommodation	(v41692361)	133.6	131.2	131.0	-0.2	-1.9
Owned accommodation	(v41692363)	175.3	175.2	176.9	1.0	0.9
Homeowners' replacement cost	(v41692364)	189.7	188.1	187.4	-0.4	-1.2
Homeowners' home and mortgage insurance	(v41692366)	351.4	356.3	359.4	0.9	2.3
Homeowners' maintenance and repairs	(v41692367)	125.9	128.2	129.5	1.0	2.9
Water, fuel and electricity	(v41692368)	158.7	151.9	152.5	0.4	-3.9
Electricity	(v41692369)	116.2	102.3	99.5	-2.7	-14.4
Natural gas	(v41692371)	175.9	175.7	182.3	3.8	3.6
Fuel oil and other fuels		.	.	.	.	.
Household operations, furnishings and equipment	(v41692372)	120.0	120.7	121.6	0.7	1.3
Household operations	(v41692373)	133.4	133.8	135.3	1.1	1.4
Telephone services	(v41692375)	109.2	107.8	109.1	1.2	-0.1
Internet access services (2002=100)	(v41693225)	144.4	148.0	151.8	2.6	5.1
Household furnishings and equipment	(v41692380)	98.8	99.8	99.7	-0.1	0.9
Clothing and footwear	(v41692387)	97.4	96.4	98.0	1.7	0.6
Women's clothing	(v41692389)	80.3	81.8	83.9	2.6	4.5
Men's clothing	(v41692390)	91.5	89.9	90.9	1.1	-0.7
Footwear	(v41692392)	103.2	98.9	100.9	2.0	-2.2
Transportation	(v41692395)	130.3	130.9	132.4	1.1	1.6
Private transportation	(v41692396)	129.7	129.5	131.5	1.5	1.4
Purchase and leasing of passenger vehicles	(v41692398)	92.9	95.5	96.7	1.3	4.1
Gasoline	(v41692401)	157.6	140.0	146.6	4.7	-7.0
Passenger vehicle insurance premiums	(v41692404)	193.7	202.6	202.6	0.0	4.6
Public transportation	(v41692406)	136.0	142.5	141.0	-1.1	3.7
Health and personal care	(v41692411)	130.1	132.0	132.1	0.1	1.5
Health care	(v41692412)	140.6	142.2	142.3	0.1	1.2
Personal care	(v41692418)	119.6	121.7	121.8	0.1	1.8
Recreation, education and reading	(v41692421)	110.7	112.5	111.6	-0.8	0.8
Recreation	(v41692422)	102.6	104.0	102.9	-1.1	0.3
Education and reading	(v41692430)	141.6	145.1	145.5	0.3	2.8
Alcoholic beverages and tobacco products	(v41692434)	153.6	161.4	161.5	0.1	5.1
Alcoholic beverages	(v41692435)	135.4	138.9	139.0	0.1	2.7
Tobacco products and smokers' supplies	(v41692441)	171.2	184.5	184.7	0.1	7.9

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

The Consumer Price Index – October 2016

Table 9-10
The Consumer Price Index, major components, selected sub-groups and special aggregates, provinces, Whitehorse and Yellowknife, not seasonally adjusted — British Columbia

	CANSIM vector number	Indexes			Percentage change	
		October 2015	September 2016	October 2016	September 2016 to October 2016	October 2015 to October 2016
		2002=100			%	
All-items	(v41692462)	120.6	123.2	123.1	-0.1	2.1
Special aggregates						
All-items excluding food	(v41692587)	117.8	120.7	120.9	0.2	2.6
All-items excluding food and energy	(v41692588)	114.9	117.8	117.7	-0.1	2.4
All-items excluding energy	(v41692593)	118.4	120.9	120.7	-0.2	1.9
All-items excluding gasoline	(v41693265)	119.1	121.4	121.3	-0.1	1.8
Energy ¹	(v41692594)	148.5	151.1	154.8	2.4	4.2
All-items (1992=100)	(v41713427)	142.2	145.1	145.1	0.0	2.0
Food	(v41692463)	135.2	135.4	134.1	-1.0	-0.8
Food purchased from stores	(v41692464)	135.9	134.4	132.4	-1.5	-2.6
Meat	(v41692465)	149.6	146.5	144.0	-1.7	-3.7
Dairy products	(v41692475)	134.1	131.4	130.5	-0.7	-2.7
Bakery and cereal products (excluding baby food)	(v41692480)	142.4	141.3	142.1	0.6	-0.2
Fresh fruit	(v41692484)	142.3	133.5	133.7	0.1	-6.0
Fresh vegetables	(v41692487)	129.9	130.8	120.4	-8.0	-7.3
Food purchased from restaurants	(v41692494)	133.0	136.5	136.9	0.3	2.9
Shelter	(v41692495)	114.4	115.9	116.8	0.8	2.1
Rented accommodation	(v41692496)	116.3	117.4	117.6	0.2	1.1
Owned accommodation	(v41692498)	108.3	110.3	111.2	0.8	2.7
Homeowners' replacement cost	(v41692499)	108.4	114.7	115.2	0.4	6.3
Homeowners' home and mortgage insurance	(v41692501)	179.2	181.7	181.7	0.0	1.4
Homeowners' maintenance and repairs	(v41692502)	128.3	130.5	133.0	1.9	3.7
Water, fuel and electricity	(v41692503)	146.4	145.1	148.4	2.3	1.4
Electricity	(v41692504)	162.4	168.8	168.8	0.0	3.9
Natural gas	(v41692506)	98.5	85.4	93.6	9.6	-5.0
Fuel oil and other fuels	(v41692507)	210.5	200.9	214.7	6.9	2.0
Household operations, furnishings and equipment	(v41692508)	114.9	117.0	117.5	0.4	2.3
Household operations	(v41692509)	126.8	128.3	129.4	0.9	2.1
Telephone services	(v41692511)	109.9	108.1	109.0	0.8	-0.8
Internet access services (2002=100)	(v41693226)	145.2	149.2	152.8	2.4	5.2
Household furnishings and equipment	(v41692516)	93.2	96.7	95.8	-0.9	2.8
Clothing and footwear	(v41692523)	108.2	106.9	107.3	0.4	-0.8
Women's clothing	(v41692525)	91.8	91.9	91.8	-0.1	0.0
Men's clothing	(v41692526)	101.9	100.4	100.7	0.3	-1.2
Footwear	(v41692528)	111.3	106.7	109.3	2.4	-1.8
Transportation	(v41692531)	125.6	130.5	131.3	0.6	4.5
Private transportation	(v41692532)	124.7	129.5	130.6	0.8	4.7
Purchase and leasing of passenger vehicles	(v41692534)	94.6	97.6	98.5	0.9	4.1
Gasoline	(v41692537)	160.0	167.9	171.5	2.1	7.2
Passenger vehicle insurance premiums	(v41692540)	146.3	154.9	154.9	0.0	5.9
Public transportation	(v41692542)	133.2	138.4	137.2	-0.9	3.0
Health and personal care	(v41692547)	114.0	115.9	116.7	0.7	2.4
Health care	(v41692548)	117.6	120.6	120.3	-0.2	2.3
Personal care	(v41692554)	110.0	110.5	112.7	2.0	2.5
Recreation, education and reading	(v41692557)	116.4	123.0	120.0	-2.4	3.1
Recreation	(v41692558)	99.5	106.5	102.7	-3.6	3.2
Education and reading	(v41692566)	174.8	179.6	179.7	0.1	2.8
Alcoholic beverages and tobacco products	(v41692570)	137.6	141.9	142.4	0.4	3.5
Alcoholic beverages	(v41692571)	116.0	120.6	120.7	0.1	4.1
Tobacco products and smokers' supplies	(v41692577)	173.6	177.1	178.4	0.7	2.8

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

The Consumer Price Index – October 2016

Table 9-11

The Consumer Price Index, major components, selected sub-groups and special aggregates, provinces, Whitehorse and Yellowknife, not seasonally adjusted — Whitehorse (Yukon)

	CANSIM vector number	Indexes			Percentage change	
		October 2015	September 2016	October 2016	September 2016 to October 2016	October 2015 to October 2016
		2002=100			%	
All-items	(v41692598)	124.5	125.9	126.1	0.2	1.3
Special aggregates						
All-items excluding food	(v41692711)	122.8	124.7	124.8	0.1	1.6
All-items excluding food and energy	(v41692712)	119.8	122.5	122.3	-0.2	2.1
All-items excluding energy	(v41692717)	122.4	124.3	124.3	0.0	1.6
All-items excluding gasoline	(v41693267)	123.7	125.3	125.5	0.2	1.5
Energy ¹	(v41692718)	146.1	141.3	143.5	1.6	-1.8
All-items (1992=100)	(v41713430)	146.5	148.1	148.4	0.2	1.3
Food	(v41692599)	133.1	131.3	132.6	1.0	-0.4
Food purchased from stores	(v41692600)	137.0	133.6	135.4	1.3	-1.2
Meat	(v41692601)	142.8	136.6	138.9	1.7	-2.7
Dairy products	(v41692611)	136.9	133.4	131.7	-1.3	-3.8
Bakery and cereal products (excluding baby food)	(v41692616)	146.7	142.9	147.2	3.0	0.3
Fresh fruit	(v41692620)	128.3	112.6	126.7	12.5	-1.2
Fresh vegetables	(v41692623)	124.1	127.7	121.9	-4.5	-1.8
Food purchased from restaurants	(v41692630)	124.1	126.7	126.7	0.0	2.1
Shelter	(v41692631)	142.8	145.6	146.6	0.7	2.7
Rented accommodation	.	.	.	.	.	.
Owned accommodation	.	.	.	.	.	.
Homeowners' replacement cost	.	.	.	.	.	.
Homeowners' home and mortgage insurance	.	.	.	.	.	.
Homeowners' maintenance and repairs	.	.	.	.	.	.
Water, fuel and electricity	(v41692632)	149.3	146.3	150.2	2.7	0.6
Electricity	(v41692633)	119.6	123.6	123.6	0.0	3.3
Natural gas	.	.	.	.	.	.
Fuel oil and other fuels	(v41692635)	182.3	166.4	176.8	6.3	-3.0
Household operations, furnishings and equipment	(v41692636)	106.8	108.2	108.4	0.2	1.5
Household operations	(v41692637)	114.3	114.9	115.1	0.2	0.7
Telephone services	(v41692639)	98.8	98.0	98.8	0.8	0.0
Internet access services (200212=100)	(v41693227)	85.7	84.8	84.9	0.1	-0.9
Household furnishings and equipment	(v41692644)	93.9	96.9	97.0	0.1	3.3
Clothing and footwear	(v41692651)	99.0	99.5	100.4	0.9	1.4
Women's clothing	(v41692653)	83.7	78.6	80.4	2.3	-3.9
Men's clothing	(v41692654)	105.4	112.6	113.8	1.1	8.0
Footwear	(v41692656)	100.5	103.7	104.7	1.0	4.2
Transportation	(v41692659)	128.2	128.5	128.3	-0.2	0.1
Private transportation	(v41692660)	128.1	126.8	126.9	0.1	-0.9
Purchase and leasing of passenger vehicles	(v41692662)	101.7	102.9	104.3	1.4	2.6
Gasoline	(v41692665)	147.5	142.3	142.3	0.0	-3.5
Passenger vehicle insurance premiums	(v41692668)	210.3	213.8	213.8	0.0	1.7
Public transportation	(v41692670)	127.8	134.2	132.6	-1.2	3.8
Health and personal care	(v41692675)	120.1	121.5	122.3	0.7	1.8
Health care	(v41692676)	124.0	126.4	125.6	-0.6	1.3
Personal care	(v41692682)	115.5	116.1	118.4	2.0	2.5
Recreation, education and reading	(v41692685)	96.3	99.1	97.6	-1.5	1.3
Recreation	(v41692686)	89.6	91.9	90.2	-1.8	0.7
Education and reading	(v41692693)	132.7	138.7	139.0	0.2	4.7
Alcoholic beverages and tobacco products	(v41692695)	153.8	156.6	156.5	-0.1	1.8
Alcoholic beverages	(v41692696)	124.1	125.5	125.5	0.0	1.1
Tobacco products and smokers' supplies	(v41692702)	192.1	197.5	197.3	-0.1	2.7

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

The Consumer Price Index – October 2016

Table 9-12
The Consumer Price Index, major components, selected sub-groups and special aggregates, provinces, Whitehorse and Yellowknife, not seasonally adjusted — Yellowknife (Northwest Territories)

	CANSIM vector number	Indexes			Percentage change	
		October 2015	September 2016	October 2016	September 2016 to October 2016	October 2015 to October 2016
		2002=100			%	
All-items	(v41692722)	131.6	131.8	132.7	0.7	0.8
Special aggregates						
All-items excluding food	(v41692835)	129.9	130.2	131.2	0.8	1.0
All-items excluding food and energy	(v41692836)	124.4	125.8	126.5	0.6	1.7
All-items excluding energy	(v41692841)	127.2	128.4	129.0	0.5	1.4
All-items excluding gasoline	(v41693269)	131.0	131.5	132.3	0.6	1.0
Energy ¹	(v41692842)	176.3	165.2	169.3	2.5	-5.0
All-items (1992=100)	(v41713431)	153.1	153.4	154.3	0.6	0.8
Food	(v41692723)	141.1	140.7	140.7	0.0	-0.3
Food purchased from stores	(v41692724)	141.1	139.9	139.8	-0.1	-0.9
Meat	(v41692725)	182.4	182.6	185.2	1.4	1.5
Dairy products	(v41692735)	128.9	132.1	129.5	-2.0	0.5
Bakery and cereal products (excluding baby food)	(v41692740)	144.3	135.3	139.9	3.4	-3.0
Fresh fruit	(v41692744)	135.4	120.1	118.9	-1.0	-12.2
Fresh vegetables	(v41692747)	156.5	162.8	158.4	-2.7	1.2
Food purchased from restaurants	(v41692754)	139.6	142.2	142.2	0.0	1.9
Shelter ²	(v41692755)	150.1	149.6	150.5	0.6	0.3
Rented accommodation	.	.	.	.	.	.
Owned accommodation	.	.	.	.	.	.
Homeowners' replacement cost	.	.	.	.	.	.
Homeowners' home and mortgage insurance	.	.	.	.	.	.
Homeowners' maintenance and repairs	.	.	.	.	.	.
Water, fuel and electricity	(v41692756)	190.6	180.4	185.1	2.6	-2.9
Electricity	(v41692757)	196.8	184.8	184.8	0.0	-6.1
Natural gas	.	.	.	.	.	.
Fuel oil and other fuels	(v41692759)	210.8	193.6	208.9	7.9	-0.9
Household operations, furnishings and equipment	(v41692760)	115.2	116.2	116.4	0.2	1.0
Household operations	(v41692761)	123.1	122.5	123.1	0.5	0.0
Telephone services	(v41692763)	98.9	98.2	99.3	1.1	0.4
Internet access services (2002=100)	(v41693228)	73.3	72.7	72.7	0.0	-0.8
Household furnishings and equipment	(v41692768)	98.3	102.4	101.8	-0.6	3.6
Clothing and footwear	(v41692775)	102.7	104.4	106.2	1.7	3.4
Women's clothing	(v41692777)	83.5	88.4	91.8	3.8	9.9
Men's clothing	(v41692778)	114.5	114.2	114.1	-0.1	-0.3
Footwear	(v41692780)	99.0	96.7	97.1	0.4	-1.9
Transportation	(v41692783)	125.5	126.3	128.3	1.6	2.2
Private transportation	(v41692784)	126.2	125.4	128.5	2.5	1.8
Purchase and leasing of passenger vehicles	(v41692786)	100.2	100.6	104.9	4.3	4.7
Gasoline	(v41692789)	145.2	133.4	135.4	1.5	-6.7
Passenger vehicle insurance premiums	(v41692792)	189.1	192.7	192.7	0.0	1.9
Public transportation	(v41692794)	126.5	132.8	131.2	-1.2	3.7
Health and personal care	(v41692799)	122.0	118.2	119.4	1.0	-2.1
Health care	(v41692800)	116.9	119.1	118.2	-0.8	1.1
Personal care	(v41692806)	126.7	118.9	121.4	2.1	-4.2
Recreation, education and reading	(v41692809)	104.6	104.8	105.2	0.4	0.6
Recreation	(v41692810)	100.3	100.3	100.8	0.5	0.5
Education and reading	(v41692817)	129.7	131.6	131.8	0.2	1.6
Alcoholic beverages and tobacco products	(v41692819)	163.9	168.8	169.4	0.4	3.4
Alcoholic beverages	(v41692820)	144.0	144.6	144.8	0.1	0.6
Tobacco products and smokers' supplies	(v41692826)	189.0	201.6	202.7	0.5	7.2

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

The Consumer Price Index – October 2016

Table 10
The All-items Consumer Price Index, provinces, Whitehorse, Yellowknife and Iqaluit, ¹ not seasonally adjusted,
historical data

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual average ²
2002=100													
Newfoundland and Labrador (v41691244)													
2011	119.0	119.7	120.9	121.5	121.5	120.9	121.6	122.0	122.3	122.1	122.9	121.9	121.4
2012	122.5	123.0	123.9	125.2	124.5	123.5	123.6	124.0	124.5	124.8	124.3	123.5	123.9
2013	123.6	125.8	125.9	125.9	125.9	126.0	126.1	126.0	126.6	126.7	127.0	126.6	126.0
2014	126.7	127.6	128.4	128.8	129.2	129.1	128.9	129.1	129.1	129.0	127.9	126.8	128.4
2015	126.2	127.5	128.9	128.3	129.6	129.9	129.8	130.0	129.6	129.7	129.3	128.6	129.0
2016	129.2	129.6	130.3	130.9	131.5	133.0	134.2	133.9	134.5	134.9	..	..	..
Prince Edward Island (v41691379)													
2011	120.1	121.1	122.2	123.3	123.9	123.3	123.3	123.9	123.7	123.9	124.0	123.4	123.0
2012	123.6	124.8	125.6	126.3	125.9	125.2	125.2	125.6	126.2	126.5	125.9	124.9	125.5
2013	125.2	126.7	127.1	128.6	127.9	127.9	128.1	128.6	129.0	129.0	129.2	128.6	128.0
2014	129.2	130.1	130.9	130.5	130.6	130.5	130.4	130.2	130.5	130.5	129.3	128.1	130.1
2015	126.7	128.2	129.8	128.9	129.7	130.4	130.3	130.1	129.4	129.4	129.6	129.2	129.3
2016	129.1	129.6	130.2	131.1	131.4	131.8	131.1	130.6	130.6	131.9	..	..	..
Nova Scotia (v41691513)													
2011	120.4	120.9	122.3	122.9	123.2	122.5	122.8	123.2	123.8	123.9	124.0	122.7	122.7
2012	123.7	124.3	125.3	126.1	125.6	124.8	124.5	125.0	125.7	125.6	125.5	124.9	125.1
2013	125.4	126.7	126.7	126.8	126.4	126.4	126.4	126.6	127.3	126.7	126.7	126.7	126.6
2014	127.4	128.4	128.9	129.1	129.5	129.2	128.9	129.0	129.5	129.4	128.6	127.4	128.8
2015	126.9	128.0	129.6	129.5	130.2	130.2	130.1	130.0	129.5	129.8	129.2	128.9	129.3
2016	129.4	129.6	130.1	131.0	131.6	131.8	131.2	131.2	131.6	131.6	..	..	..
New Brunswick (v41691648)													
2011	117.2	118.2	119.4	120.0	120.5	119.9	120.3	120.7	120.9	120.8	121.3	120.4	120.0
2012	121.0	121.3	122.3	123.1	122.7	121.6	121.4	121.9	122.7	122.5	122.0	121.2	122.0
2013	121.5	123.1	123.3	122.8	122.6	122.5	122.6	123.0	123.5	123.5	123.5	123.5	123.0
2014	123.4	124.4	125.1	125.0	125.3	124.9	124.8	124.9	125.2	125.5	124.9	124.1	124.8
2015	123.1	124.2	125.5	124.9	126.1	126.2	126.3	126.2	125.6	125.9	125.8	125.5	125.4
2016	126.0	126.4	126.9	127.7	128.1	128.5	129.4	129.0	129.4	129.4	..	..	..
Quebec (v41691783)													
2011	116.4	116.7	118.3	118.5	118.9	118.2	118.3	118.5	118.7	119.0	119.3	118.7	118.3
2012	119.7	120.4	120.8	121.3	121.1	120.6	120.5	120.9	120.9	121.3	121.1	120.5	120.8
2013	120.4	122.1	121.8	121.8	121.9	121.8	121.8	121.9	122.0	121.6	121.8	121.5	121.7
2014	121.7	122.6	122.9	123.4	123.8	123.9	123.7	123.8	123.9	124.3	123.8	122.8	123.4
2015	122.6	123.9	124.7	124.7	125.3	125.2	125.3	125.2	125.1	125.2	124.9	124.4	124.7
2016	124.6	125.1	125.6	126.0	126.2	126.0	125.6	125.3	125.8	125.9	..	..	..
Ontario (v41691919)													
2011	117.8	118.0	119.4	119.9	120.9	120.2	120.5	120.6	121.1	121.0	121.0	120.3	120.1
2012	120.6	121.4	122.0	122.4	122.4	121.6	121.4	121.8	122.0	122.2	121.9	121.3	121.8
2013	121.3	122.8	123.2	122.9	123.0	123.2	123.4	123.4	123.5	123.3	123.3	123.1	123.0
2014	123.3	124.6	125.1	125.9	126.5	126.9	126.5	126.5	126.7	126.8	126.3	125.4	125.9
2015	125.3	126.2	127.1	126.9	127.7	128.2	128.4	128.0	127.8	127.9	127.9	127.5	127.4
2016	127.8	128.2	129.0	129.6	130.1	130.4	130.3	129.9	130.1	130.6	..	..	..
Manitoba (v41692055)													
2011	116.6	117.0	117.9	118.3	119.5	118.6	118.2	118.3	119.1	119.3	119.6	118.6	118.4
2012	118.9	119.0	119.5	120.4	120.8	120.3	120.3	120.5	121.0	121.3	121.1	120.2	120.3
2013	120.3	121.6	122.3	122.6	123.0	123.6	123.9	123.8	124.0	124.0	124.0	122.7	123.0
2014	123.4	124.3	125.1	125.4	126.2	126.0	125.8	125.6	125.6	125.6	125.4	124.5	125.3
2015	124.3	125.2	126.6	126.5	126.8	127.3	127.1	127.8	127.4	128.0	127.7	126.4	126.8
2016	126.9	126.6	127.8	128.1	128.9	130.0	129.0	129.2	129.0	129.4	..	..	..
Saskatchewan (v41692191)													
2011	120.1	120.3	121.4	121.5	122.6	121.7	121.8	122.1	123.0	123.0	123.4	122.4	122.0
2012	122.9	122.7	123.6	124.2	124.5	124.1	123.9	124.2	124.5	124.8	124.5	123.3	123.9
2013	123.5	124.9	125.2	125.4	126.0	126.2	125.9	125.7	126.4	126.7	126.3	126.1	125.7
2014	126.4	127.8	128.7	128.9	129.2	129.0	129.0	129.1	129.2	129.9	129.0	128.3	128.7
2015	128.2	129.3	130.5	130.5	131.1	131.5	131.4	131.6	131.0	131.7	131.7	130.6	130.8
2016	131.0	131.1	132.2	132.3	132.7	133.3	132.8	132.5	132.4	132.7	..	..	..

The Consumer Price Index – October 2016

Table 10 – continued

The All-items Consumer Price Index, provinces, Whitehorse, Yellowknife and Iqaluit, ¹ not seasonally adjusted, historical data

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual average ²
2002=100													
Alberta (v41692327)													
2011	123.5	124.2	124.5	126.0	126.1	125.3	125.7	126.3	126.0	127.2	126.6	126.5	125.7
2012	127.1	126.6	126.6	127.0	126.6	126.9	126.8	127.6	127.8	128.0	127.3	126.5	127.1
2013	126.5	127.7	128.1	128.7	129.5	129.8	129.6	129.4	129.5	129.3	129.5	129.1	128.9
2014	129.9	130.8	133.1	132.2	132.8	132.3	132.9	132.7	132.9	133.2	132.1	131.5	132.2
2015	131.0	132.0	133.0	133.1	133.6	134.5	134.6	135.0	134.6	135.1	134.7	133.5	133.7
2016	133.7	133.8	135.0	135.1	135.6	136.3	135.6	135.9	135.3	135.8	..	..	..
British Columbia (v41692462)													
2011	114.8	115.2	116.1	116.3	117.1	116.5	116.6	116.9	117.3	117.4	117.5	116.5	116.5
2012	116.8	117.2	117.9	118.2	118.6	118.2	117.9	118.1	118.1	118.0	117.6	117.0	117.8
2013	117.1	118.3	118.5	117.2	117.9	117.6	117.9	118.0	118.1	117.7	117.4	117.0	117.7
2014	117.1	118.0	118.6	119.0	119.7	119.8	119.6	119.6	119.5	119.0	118.8	118.1	118.9
2015	118.0	118.9	119.8	119.6	120.6	120.7	120.8	121.0	121.0	120.6	120.8	120.4	120.2
2016	120.7	120.8	121.8	121.8	122.7	123.1	123.3	123.4	123.2	123.1	..	..	..
Whitehorse, Yukon (v41692598)													
2011	115.9	115.9	117.0	117.3	118.4	118.6	118.7	118.6	119.0	119.1	119.4	118.8	118.1
2012	118.8	119.0	120.1	120.7	121.5	121.3	121.4	121.5	121.4	121.6	121.6	121.1	120.8
2013	120.8	121.2	121.5	121.6	122.6	124.1	124.0	124.1	124.0	123.6	123.0	123.2	122.8
2014	123.4	124.0	124.3	124.4	125.1	125.3	125.2	125.1	124.9	124.3	123.9	123.1	124.4
2015	121.8	122.1	123.0	123.5	124.4	125.1	125.4	126.0	125.6	124.5	124.0	124.1	124.1
2016	124.1	123.7	124.2	124.4	125.2	126.6	126.4	126.4	125.9	126.1	..	..	..
Yellowknife, Northwest Territories (v41692722)													
2011	119.3	119.2	120.5	120.9	121.6	121.6	122.0	122.0	122.3	122.6	123.4	123.4	121.6
2012	124.1	123.1	123.6	125.1	124.9	124.5	124.3	124.3	123.9	124.4	124.9	124.8	124.3
2013	125.1	125.4	125.6	126.0	126.1	126.5	126.5	126.6	126.4	126.4	126.6	126.6	126.2
2014	127.0	127.9	128.0	127.7	128.7	128.8	128.7	129.0	128.7	129.0	129.0	128.7	128.4
2015	128.1	128.4	129.4	129.8	130.6	131.4	131.3	131.6	131.2	131.6	131.6	130.6	130.4
2016	130.7	131.0	131.6	131.9	131.9	132.6	132.4	132.1	131.8	132.7	..	..	..
Iqaluit, Nunavut (200212=100) (v41713432)													
2011	112.5	112.3	112.6	113.2	113.5	113.3	113.3	113.4	113.6	114.3	114.5	114.2	113.4
2012	114.2	114.4	114.4	114.9	115.9	116.1	116.1	115.9	115.9	115.2	115.3	115.1	115.3
2013	115.5	115.8	115.8	116.5	117.2	117.5	117.5	117.5	117.5	116.6	116.1	116.2	116.6
2014	116.7	117.2	117.3	117.7	118.1	118.7	118.9	119.0	118.8	118.4	118.1	117.9	118.1
2015	118.2	118.9	119.1	120.0	120.4	121.0	121.2	121.3	121.7	121.1	121.0	120.8	120.4
2016	121.0	121.7	122.1	122.8	123.1	123.7	125.0	124.9	124.5	123.8	..	..	..

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

The Consumer Price Index – October 2016

Table 11
The Consumer Price Index and selected sub-groups, by city, 1 not seasonally adjusted

	CANSIM vector number	Indexes			Percentage change	
		October 2015	September 2016	October 2016	September 2016 to October 2016	October 2015 to October 2016
		2002=100			%	
St. John's, Newfoundland and Labrador						
All-items	(v41692846)	129.3	134.1	134.6	0.4	4.1
Shelter	(v41692847)	148.6	149.7	151.6	1.3	2.0
Rented accommodation	(v41692848)	129.6	129.6	129.9	0.2	0.2
Owned accommodation	(v41692849)	145.8	151.3	154.1	1.9	5.0
Water, fuel and electricity	(v41692850)	167.9	159.6	160.7	0.7	-4.3
All-items (1992=100)	(v41713405)	151.8	157.4	157.9	0.3	4.0
Charlottetown and Summerside, Prince Edward Island						
All-items	(v41692852)	128.9	130.1	131.3	0.9	1.9
Shelter	(v41692853)	128.9	128.1	129.5	1.1	0.5
Rented accommodation	(v41692854)	118.0	118.0	118.3	0.3	0.3
Owned accommodation	(v41692855)	117.4	118.1	119.0	0.8	1.4
Water, fuel and electricity	(v41692856)	173.1	166.2	171.6	3.2	-0.9
All-items (1992=100)	(v41713407)	151.0	152.4	153.8	0.9	1.9
Halifax, Nova Scotia						
All-items	(v41692858)	128.8	130.6	130.5	-0.1	1.3
Shelter	(v41692859)	135.0	135.2	135.3	0.1	0.2
Rented accommodation	(v41692860)	116.4	117.4	117.5	0.1	0.9
Owned accommodation	(v41692861)	132.9	133.1	133.5	0.3	0.5
Water, fuel and electricity	(v41692862)	166.4	165.2	164.3	-0.5	-1.3
All-items (1992=100)	(v41713409)	153.4	155.5	155.4	-0.1	1.3
Saint John, New Brunswick						
All-items	(v41692864)	125.7	129.3	129.2	-0.1	2.8
Shelter	(v41692865)	132.8	134.9	135.7	0.6	2.2
Rented accommodation	(v41692866)	117.7	118.6	118.7	0.1	0.8
Owned accommodation	(v41692867)	126.2	128.0	128.8	0.6	2.1
Water, fuel and electricity	(v41692868)	164.8	169.3	170.7	0.8	3.6
All-items (1992=100)	(v41713411)	148.6	152.8	152.8	0.0	2.8
Québec, Quebec						
All-items	(v41692870)	125.2	125.7	125.9	0.2	0.6
Shelter	(v41692871)	129.6	130.3	131.0	0.5	1.1
Rented accommodation	(v41692872)	122.4	123.6	123.7	0.1	1.1
Owned accommodation	(v41692873)	132.8	133.4	134.7	1.0	1.4
Water, fuel and electricity	(v41692874)	129.1	128.8	129.2	0.3	0.1
All-items (1992=100)	(v41713413)	145.4	146.1	146.3	0.1	0.6
Montréal, Quebec						
All-items	(v41692876)	125.6	126.4	126.3	-0.1	0.6
Shelter	(v41692877)	127.8	128.8	129.4	0.5	1.3
Rented accommodation	(v41692878)	118.0	119.0	119.1	0.1	0.9
Owned accommodation	(v41692879)	132.6	133.8	134.7	0.7	1.6
Water, fuel and electricity	(v41692880)	130.3	130.2	131.1	0.7	0.6
All-items (1992=100)	(v41713414)	145.3	146.2	146.1	-0.1	0.6
Ottawa-Gatineau, Ontario part, Ontario/Quebec²						
All-items	(v41692882)	126.8	128.4	128.8	0.3	1.6
Shelter	(v41692883)	133.9	135.2	135.4	0.1	1.1
Rented accommodation	(v41692884)	116.7	117.3	117.4	0.1	0.6
Owned accommodation	(v41692885)	136.4	136.3	137.1	0.6	0.5
Water, fuel and electricity	(v41692886)	160.6	170.3	167.9	-1.4	4.5
All-items (1992=100)	(v41713416)	154.5	156.4	156.9	0.3	1.6
Toronto, Ontario						
All-items	(v41692888)	129.0	131.7	132.0	0.2	2.3
Shelter	(v41692889)	135.9	141.2	141.6	0.3	4.2
Rented accommodation	(v41692890)	118.7	119.9	120.0	0.1	1.1
Owned accommodation	(v41692891)	138.6	144.0	145.1	0.8	4.7
Water, fuel and electricity	(v41692892)	161.5	175.6	172.4	-1.8	6.7
All-items (1992=100)	(v41713417)	155.5	158.7	159.1	0.3	2.3

The Consumer Price Index – October 2016

Table 11 – continued

The Consumer Price Index and selected sub-groups, by city, ¹ not seasonally adjusted

	CANSIM vector number	Indexes			Percentage change	
		October 2015	September 2016	October 2016	September 2016 to October 2016	October 2015 to October 2016
		2002=100			%	
Thunder Bay, Ontario						
All-items	(v41692894)	122.8	124.4	125.1	0.6	1.9
Shelter	(v41692895)	116.6	118.6	120.0	1.2	2.9
Rented accommodation	(v41692896)	111.9	112.6	112.7	0.1	0.7
Owned accommodation	(v41692897)	108.5	108.2	109.4	1.1	0.8
Water, fuel and electricity	(v41692898)	162.4	174.3	178.4	2.4	9.9
All-items (1992=100)	(v41713418)	146.5	148.4	149.2	0.5	1.8
Winnipeg, Manitoba						
All-items	(v41692900)	127.8	128.8	129.2	0.3	1.1
Shelter	(v41692901)	137.8	140.2	140.9	0.5	2.2
Rented accommodation	(v41692902)	129.4	130.7	130.9	0.2	1.2
Owned accommodation	(v41692903)	143.8	145.6	146.7	0.8	2.0
Water, fuel and electricity	(v41692904)	126.5	132.2	132.3	0.1	4.6
All-items (1992=100)	(v41713420)	157.5	158.8	159.3	0.3	1.1
Regina, Saskatchewan						
All-items	(v41692906)	132.4	133.1	133.4	0.2	0.8
Shelter	(v41692907)	161.0	161.4	161.9	0.3	0.6
Rented accommodation	(v41692908)	140.7	140.8	140.9	0.1	0.1
Owned accommodation	(v41692909)	173.1	172.8	173.7	0.5	0.3
Water, fuel and electricity	(v41692910)	149.0	152.2	152.3	0.1	2.2
All-items (1992=100)	(v41713422)	164.9	165.8	166.2	0.2	0.8
Saskatoon, Saskatchewan						
All-items	(v41692912)	132.0	132.8	133.1	0.2	0.8
Shelter	(v41692913)	158.8	159.3	159.9	0.4	0.7
Rented accommodation	(v41692914)	146.3	145.9	146.0	0.1	-0.2
Owned accommodation	(v41692915)	162.7	161.6	162.6	0.6	-0.1
Water, fuel and electricity	(v41692916)	160.6	167.0	167.1	0.1	4.0
All-items (1992=100)	(v41713423)	162.5	163.4	163.8	0.2	0.8
Edmonton, Alberta						
All-items	(v41692918)	134.8	135.2	135.7	0.4	0.7
Shelter	(v41692919)	163.1	162.0	163.1	0.7	0.0
Rented accommodation	(v41692920)	141.1	140.3	140.3	0.0	-0.6
Owned accommodation	(v41692921)	163.8	163.8	165.3	0.9	0.9
Water, fuel and electricity	(v41692922)	182.9	176.9	178.5	0.9	-2.4
All-items (1992=100)	(v41713425)	164.4	164.8	165.4	0.4	0.6
Calgary, Alberta						
All-items	(v41692924)	135.7	135.7	136.3	0.4	0.4
Shelter	(v41692925)	164.9	162.7	163.7	0.6	-0.7
Rented accommodation	(v41692926)	129.4	126.7	126.5	-0.2	-2.2
Owned accommodation	(v41692927)	182.7	182.3	184.2	1.0	0.8
Water, fuel and electricity	(v41692928)	141.1	134.2	133.8	-0.3	-5.2
All-items (1992=100)	(v41713426)	170.7	170.8	171.4	0.4	0.4
Vancouver, British Columbia						
All-items	(v41692930)	122.4	125.4	125.4	0.0	2.5
Shelter	(v41692931)	118.5	120.3	121.4	0.9	2.4
Rented accommodation	(v41692932)	117.9	119.4	119.6	0.2	1.4
Owned accommodation	(v41692933)	115.8	118.2	119.3	0.9	3.0
Water, fuel and electricity	(v41692934)	136.0	134.4	138.1	2.8	1.5
All-items (1992=100)	(v41713428)	145.3	148.8	148.8	0.0	2.4
Victoria, British Columbia						
All-items	(v41692936)	119.0	121.5	121.3	-0.2	1.9
Shelter	(v41692937)	110.1	111.4	112.1	0.6	1.8
Rented accommodation	(v41692938)	116.2	117.3	117.6	0.3	1.2
Owned accommodation	(v41692939)	99.0	100.5	101.2	0.7	2.2
Water, fuel and electricity	(v41692940)	176.9	178.1	179.7	0.9	1.6
All-items (1992=100)	(v41713429)	139.8	142.6	142.4	-0.1	1.9

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

The Consumer Price Index – October 2016

Table 12
The All-items Consumer Price Index by city, 1 not seasonally adjusted, historical data

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual average ²
2002=100													
St. John's, Newfoundland and Labrador (v41692846)													
2011	119.1	119.7	120.7	121.3	121.5	120.8	121.5	121.9	122.1	122.1	122.7	121.9	121.3
2012	122.4	122.9	123.7	125.0	124.4	123.3	123.4	123.8	124.3	124.6	124.1	123.4	123.8
2013	123.4	125.5	125.6	125.6	125.6	125.8	125.8	125.8	126.4	126.5	126.8	126.4	125.8
2014	126.5	127.4	128.2	128.6	129.0	128.8	128.7	128.9	128.8	128.8	127.6	126.6	128.2
2015	126.1	127.2	128.7	128.1	129.4	129.7	129.5	129.7	129.2	129.3	128.9	128.4	128.7
2016	128.9	129.3	129.9	130.6	131.2	132.7	133.8	133.5	134.1	134.6	..	..	..
Charlottetown and Summerside, Prince Edward Island (v41692852)													
2011	119.7	120.6	121.7	122.7	123.3	122.7	122.7	123.2	123.1	123.3	123.4	122.7	122.4
2012	122.9	124.1	124.8	125.5	125.1	124.5	124.5	124.9	125.5	125.7	125.2	124.2	124.7
2013	124.4	125.9	126.3	127.8	127.1	127.1	127.4	127.8	128.3	128.3	128.5	127.8	127.2
2014	128.4	129.2	130.0	129.6	129.7	129.6	129.6	129.4	129.7	129.8	128.6	127.5	129.3
2015	126.3	127.7	129.2	128.4	129.1	129.7	129.7	129.6	128.9	128.9	129.1	128.7	128.8
2016	128.6	129.2	129.8	130.6	130.8	131.2	130.6	130.1	130.1	131.3	..	..	..
Halifax, Nova Scotia (v41692858)													
2011	119.5	120.0	121.3	121.9	122.1	121.5	121.8	122.2	122.8	122.9	122.9	121.6	121.7
2012	122.4	123.0	124.0	124.8	124.2	123.5	123.3	123.8	124.5	124.4	124.3	123.7	123.8
2013	124.1	125.2	125.3	125.4	125.1	125.0	125.1	125.2	126.0	125.4	125.5	125.4	125.2
2014	126.0	127.0	127.6	127.7	128.2	127.7	127.5	127.7	128.2	128.2	127.4	126.2	127.5
2015	125.8	126.9	128.4	128.3	128.9	128.9	128.9	128.8	128.4	128.8	128.1	127.7	128.2
2016	128.2	128.4	129.0	129.9	130.5	130.6	130.1	130.1	130.6	130.5	..	..	..
Saint John, New Brunswick (v41692864)													
2011	117.5	118.5	119.8	120.2	120.7	120.1	120.6	120.9	121.1	121.0	121.5	120.6	120.2
2012	121.0	121.4	122.4	123.2	122.8	121.8	121.6	122.0	122.8	122.6	122.1	121.4	122.1
2013	121.5	123.1	123.4	122.8	122.6	122.5	122.6	122.9	123.5	123.5	123.5	123.4	122.9
2014	123.4	124.4	125.2	125.0	125.3	124.8	124.7	124.7	125.1	125.4	124.7	123.9	124.7
2015	123.0	124.1	125.3	124.8	125.9	126.0	126.1	125.9	125.4	125.7	125.6	125.4	125.3
2016	125.9	126.3	126.8	127.6	127.9	128.3	129.2	128.9	129.3	129.2	..	..	..
Québec, Quebec (v41692870)													
2011	116.3	116.6	118.2	118.4	118.8	118.1	118.2	118.5	118.7	119.0	119.3	118.7	118.2
2012	119.8	120.4	120.8	121.3	121.2	120.6	120.6	121.0	121.1	121.4	121.3	120.6	120.8
2013	120.6	122.3	122.1	122.0	122.1	122.0	122.0	122.2	122.2	121.8	121.9	121.6	121.9
2014	121.9	122.7	123.0	123.6	123.9	124.0	123.8	124.0	124.1	124.5	123.9	122.9	123.5
2015	122.7	123.9	124.8	124.8	125.3	125.2	125.3	125.2	125.1	125.2	124.9	124.4	124.7
2016	124.5	125.0	125.5	125.9	126.2	125.9	125.5	125.3	125.7	125.9	..	..	..
Montréal, Quebec (v41692876)													
2011	116.3	116.5	118.1	118.3	118.6	117.9	118.0	118.2	118.4	118.8	119.0	118.4	118.0
2012	119.4	120.0	120.4	120.9	120.7	120.2	120.2	120.5	120.5	120.9	120.8	120.1	120.4
2013	120.1	121.7	121.4	121.4	121.6	121.4	121.5	121.5	121.5	121.4	121.6	121.2	121.4
2014	121.5	122.3	122.6	123.2	123.5	123.6	123.5	123.7	123.8	124.1	123.8	122.9	123.2
2015	122.9	124.1	124.8	124.9	125.4	125.3	125.3	125.3	125.3	125.6	125.1	124.7	124.9
2016	124.8	125.4	125.8	126.2	126.6	126.2	125.9	125.8	126.4	126.3	..	..	..
Ottawa-Gatineau, Ontario part, Ontario/Quebec (v41692882) ³													
2011	117.9	118.2	119.5	120.0	121.0	120.2	120.4	120.5	121.1	121.1	121.0	120.3	120.1
2012	120.6	121.4	122.0	122.4	122.3	121.4	121.3	121.7	121.9	122.1	121.9	121.2	121.7
2013	121.3	122.7	123.1	122.8	122.9	123.0	123.3	123.2	123.3	123.1	123.0	122.8	122.9
2014	123.0	124.2	124.7	125.3	125.9	126.3	125.9	125.9	126.1	126.1	125.5	124.7	125.3
2015	124.5	125.4	126.2	126.0	126.9	127.4	127.6	127.1	126.8	126.8	126.8	126.3	126.5
2016	126.5	126.8	127.5	128.1	128.7	128.8	128.7	128.2	128.4	128.8	..	..	..
Toronto, Ontario (v41692888)													
2011	117.5	117.9	119.4	119.8	120.8	120.2	120.4	120.5	121.2	121.1	120.9	120.2	120.0
2012	120.7	121.5	122.0	122.4	122.4	121.7	121.6	121.8	122.1	122.3	122.0	121.4	121.8
2013	121.5	122.9	123.3	123.1	123.2	123.4	123.6	123.7	123.8	123.7	123.6	123.4	123.3
2014	123.7	125.0	125.5	126.4	127.0	127.4	126.9	126.9	127.2	127.4	126.9	126.2	126.4
2015	126.3	127.2	127.9	127.7	128.5	128.8	129.2	128.7	129.0	129.0	129.1	128.7	128.3
2016	129.0	129.4	130.3	130.7	131.2	131.5	131.4	131.1	131.7	132.0	..	..	..

The Consumer Price Index – October 2016

Table 12 – continued

The All-items Consumer Price Index by city, ¹ not seasonally adjusted, historical data

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual average ²
	2002=100												
Thunder Bay, Ontario (v41692894)													
2011	114.2	114.2	115.5	116.3	117.3	116.5	116.7	116.8	117.5	117.4	117.2	116.4	116.3
2012	116.5	117.3	117.9	118.1	118.0	117.1	116.8	117.2	117.4	117.9	117.6	116.8	117.4
2013	116.8	118.4	118.6	118.1	118.3	118.5	118.7	118.7	118.6	118.8	118.9	118.8	118.4
2014	118.9	120.0	120.4	121.1	121.7	122.1	121.7	121.6	121.6	121.6	121.2	120.3	121.0
2015	120.2	121.1	122.0	121.6	122.6	123.2	123.3	122.8	122.5	122.8	122.9	122.5	122.3
2016	122.8	123.1	123.8	124.3	124.9	125.0	124.8	124.3	124.4	125.1	..	..	..
Winnipeg, Manitoba (v41692900)													
2011	116.3	116.7	117.6	117.9	119.1	118.3	117.9	118.0	118.8	119.0	119.3	118.3	118.1
2012	118.6	118.7	119.2	120.0	120.4	120.0	119.9	120.2	120.6	120.9	120.8	119.9	119.9
2013	120.0	121.3	121.9	122.2	122.6	123.1	123.4	123.4	123.6	123.6	123.7	122.4	122.6
2014	123.1	123.9	124.7	124.9	125.8	125.6	125.4	125.2	125.4	125.3	125.1	124.3	124.9
2015	124.2	125.0	126.5	126.3	126.6	127.0	126.8	127.6	127.2	127.8	127.4	126.2	126.6
2016	126.7	126.4	127.6	127.8	128.6	129.6	128.8	128.9	128.8	129.2	..	..	..
Regina, Saskatchewan (v41692906)													
2011	120.5	120.7	121.8	121.9	123.0	122.1	122.3	122.5	123.6	123.6	123.9	123.0	122.4
2012	123.5	123.3	124.2	124.8	125.1	124.7	124.6	124.9	125.2	125.6	125.3	124.1	124.6
2013	124.4	125.8	126.3	126.5	127.0	127.2	126.9	126.7	127.4	127.7	127.4	127.2	126.7
2014	127.4	128.7	129.7	129.9	130.2	129.9	130.1	130.2	130.9	129.9	129.9	129.2	129.7
2015	128.9	130.1	131.4	131.4	131.9	132.4	132.2	132.4	131.7	132.4	132.4	131.3	131.5
2016	131.5	131.6	132.9	133.1	133.5	134.2	133.5	133.2	133.1	133.4	..	..	..
Saskatoon, Saskatchewan (v41692912)													
2011	120.9	121.1	122.1	122.2	123.3	122.3	122.5	122.7	123.5	123.6	123.9	122.9	122.6
2012	123.4	123.2	124.0	124.6	125.0	124.6	124.4	124.6	124.9	125.2	125.0	123.7	124.4
2013	123.8	125.0	125.3	125.4	126.0	126.1	125.9	125.7	126.4	126.6	126.2	126.0	125.7
2014	126.4	127.7	128.6	128.6	129.0	128.8	128.8	129.0	129.1	129.9	129.1	128.5	128.6
2015	128.5	129.6	130.7	130.7	131.3	131.7	131.6	131.8	131.4	132.0	132.0	131.0	131.0
2016	131.5	131.6	132.7	132.7	133.1	133.6	133.1	132.9	132.8	133.1	..	..	..
Edmonton, Alberta (v41692918)													
2011	123.9	124.3	124.8	126.2	126.5	125.6	125.9	126.6	126.4	127.6	126.9	126.7	126.0
2012	127.3	126.9	127.0	127.4	127.0	127.2	127.1	127.9	128.1	128.5	127.7	127.0	127.4
2013	126.8	128.0	128.3	129.0	129.7	130.0	129.5	129.4	129.5	129.2	129.3	128.9	129.0
2014	129.6	130.4	132.5	131.9	132.1	132.1	132.4	132.2	132.3	132.8	131.9	131.1	131.8
2015	130.5	131.6	132.6	132.8	133.3	134.1	134.1	134.7	134.4	134.8	134.5	133.2	133.4
2016	133.4	133.3	134.7	135.0	135.4	136.2	135.3	135.6	135.2	135.7	..	..	..
Calgary, Alberta (v41692924)													
2011	123.3	124.2	124.3	125.6	125.8	124.9	125.5	125.9	125.7	126.9	126.3	126.2	125.4
2012	126.7	126.3	126.3	126.7	126.2	126.5	126.4	127.2	127.5	127.5	126.9	126.0	126.7
2013	126.3	127.5	127.9	128.5	129.3	129.7	129.6	129.3	129.5	129.4	129.6	129.3	128.8
2014	130.2	131.2	133.8	132.6	133.5	132.8	133.4	133.4	133.6	133.7	132.6	132.1	132.7
2015	131.7	132.6	133.6	133.6	134.1	135.0	135.1	135.5	135.1	135.7	135.3	134.1	134.3
2016	134.3	134.4	135.5	135.5	135.9	136.6	135.9	136.3	135.7	136.3	..	..	..
Vancouver, British Columbia (v41692930)													
2011	115.8	116.0	117.0	117.2	118.0	117.5	117.5	117.7	118.3	118.5	118.7	117.7	117.5
2012	117.9	118.4	119.1	119.4	119.8	119.5	119.2	119.4	119.3	119.3	118.9	118.3	119.0
2013	118.5	119.8	120.0	118.5	119.3	119.0	119.3	119.5	119.6	119.3	119.0	118.5	119.2
2014	118.7	119.5	120.3	120.7	121.2	121.4	121.2	121.2	121.2	120.6	120.5	119.6	120.5
2015	119.7	120.6	121.5	121.3	122.4	122.4	122.5	122.7	122.7	122.4	122.7	122.4	121.9
2016	122.7	122.8	124.0	124.0	124.9	125.3	125.7	125.6	125.4	125.4	..	..	..
Victoria, British Columbia (v41692936)													
2011	114.0	114.3	115.2	115.4	116.2	115.5	115.5	115.8	116.2	116.4	116.5	115.4	115.5
2012	115.7	116.1	116.9	117.3	117.6	117.1	116.7	116.9	116.8	116.8	116.3	115.6	116.7
2013	115.8	116.9	117.1	115.8	116.5	116.2	116.4	116.5	116.5	116.2	116.0	115.6	116.3
2014	115.7	116.5	117.0	117.3	118.0	118.1	118.0	118.0	117.9	117.5	117.4	116.7	117.3
2015	116.7	117.4	118.2	118.1	119.0	119.2	119.3	119.4	119.5	119.0	119.0	118.7	118.6
2016	118.9	119.1	120.0	120.0	121.0	121.3	121.7	121.8	121.5	121.3	..	..	..

Note(s): The all-items index for Whitehorse and Yellowknife are available from table 10.
See "Data quality, concepts and methodology — Explanatory notes for tables" section.

The Consumer Price Index – October 2016

Table 13
Average retail prices for gasoline and fuel oil, by city

	St. John's, N.L.	Charlottetown and Summerside, P.E.I.	Halifax, Saint John, N.S. N.B.	Québec, Que.	Montréal, Que.	Ottawa, Ont.	Toronto, Ont.	Thunder Bay, Ont.	Winnipeg, Man.	
	cents per litre									
Regular unleaded gasoline at self service filling stations										
October 2015	103.2	100.2	98.3	97.6	103.7	111.8	98.2	100.8	118.6	103.6
November 2015	103.1	96.0	99.1	97.6	104.5	110.9	100.5	103.0	116.8	98.4
December 2015	98.0	97.5	96.9	97.0	102.3	109.0	96.0	100.4	106.6	86.6
January 2016	93.0	93.1	93.6	92.6	97.9	102.4	86.9	95.7	96.0	83.2
February 2016	89.7	86.7	86.2	86.9	90.1	98.1	65.1	89.8	87.1	74.7
March 2016	89.3	86.2	87.3	86.2	96.4	97.7	90.6	92.5	99.9	85.0
April 2016	101.5	99.9	100.3	96.6	101.7	109.4	99.8	102.3	103.6	90.3
May 2016	104.3	103.2	102.7	100.3	103.9	111.6	104.5	106.1	108.8	94.8
June 2016	126.2	104.7	106.0	104.9	107.0	110.8	104.9	106.1	123.5	112.7
July 2016	121.7	98.4	97.0	98.7	99.9	106.2	100.9	102.4	116.6	95.5
August 2016	122.8	96.4	95.9	97.2	101.2	108.2	99.3	101.1	115.0	95.0
September 2016	127.4	100.4	102.1	102.3	103.5	111.0	98.8	100.9	110.4	94.8
October 2016	130.7	105.6	105.3	104.8	106.1	115.8	103.7	105.4	108.2	99.2
Premium unleaded gasoline at self service filling stations										
October 2015	109.5	108.1	106.9	105.5	117.0	126.1	114.4	118.0	133.1	119.6
November 2015	109.3	105.9	107.0	105.4	118.2	124.8	117.2	120.0	131.5	113.9
December 2015	105.1	105.2	105.5	104.4	115.9	122.8	113.9	117.9	123.2	102.5
January 2016	99.9	100.2	101.7	99.9	111.9	116.7	103.2	113.2	113.3	99.3
February 2016	96.4	94.4	94.7	94.2	104.1	112.4	102.2	107.1	103.1	90.0
March 2016	95.6	95.9	95.7	93.5	110.2	112.4	107.2	110.1	114.7	101.8
April 2016	107.6	107.6	108.9	104.8	116.0	122.7	116.6	119.5	119.3	107.7
May 2016	110.8	111.0	111.1	108.1	118.1	124.6	121.5	123.5	124.5	112.2
June 2016	132.4	112.8	113.9	111.0	121.4	125.6	121.9	123.4	139.2	129.6
July 2016	128.6	106.0	105.6	106.4	114.4	121.1	117.6	119.5	134.4	112.8
August 2016	129.1	104.2	103.9	104.6	116.1	123.0	116.2	118.8	130.9	112.4
September 2016	134.1	106.2	110.1	109.9	117.7	126.1	115.6	117.9	126.5	112.3
October 2016	136.0	113.5	113.3	112.2	119.6	130.7	119.7	122.5	124.2	116.3
Household heating fuel										
October 2015	82.7	83.9	93.0	97.9	85.8	86.7	95.3	103.2	109.0	100.6
November 2015	81.7	83.9	90.4	100.2	91.9	90.1	104.1	109.7	109.0	99.7
December 2015	80.4	81.9	88.3	96.2	85.4	91.6	106.7	108.4	108.5	87.3
January 2016	70.4	74.1	84.1	88.8	82.0	83.7	102.8	99.8	100.2	79.6
February 2016	67.6	73.1	81.5	84.2	77.4	80.9	98.6	96.4	92.4	75.6
March 2016	66.7	73.1	81.6	81.8	77.0	82.0	99.0	97.1	94.4	81.3
April 2016	67.7	76.3	84.8	77.1	71.6	80.3	99.0	96.6	91.1	80.3
May 2016	76.0	71.1	87.4	83.3	69.7	81.4	99.0	97.3	95.6	83.5
June 2016	82.6	74.8	88.3	89.9	81.2	87.1	92.6	99.8	102.0	89.3
July 2016	82.8	74.8	88.8	90.3	82.0	85.9	92.6	99.8	101.2	90.7
August 2016	74.8	70.0	88.6	82.6	75.2	83.3	92.6	96.4	99.0	87.9
September 2016	79.8	73.7	89.3	90.4	79.7	81.4	92.6	94.8	99.5	90.8
October 2016	82.7	79.1	87.7	99.0	85.0	86.6	94.3	98.6	108.3	97.1

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Table 13 – continued

Average retail prices for gasoline and fuel oil, by city

	Regina, Sask.	Saskatoon, Sask.	Edmonton, Alta.	Calgary, Alta.	Vancouver, B.C.	Victoria, B.C.	Whitehorse, Y.T.	Yellowknife, N.W.T.
cents per litre								
Regular unleaded gasoline at self service filling stations								
October 2015	103.7	104.1	98.0	104.8	116.6	108.7	119.8	127.2
November 2015	101.3	99.7	89.1	99.7	124.7	116.3	114.3	119.7
December 2015	88.5	87.6	81.5	86.2	122.9	113.9	101.2	112.4
January 2016	80.6	77.7	73.3	80.3	110.7	103.7	98.2	107.3
February 2016	72.5	74.0	63.1	73.5	105.9	98.1	90.8	98.5
March 2016	86.9	84.4	78.1	84.6	112.9	105.9	94.7	104.4
April 2016	88.2	90.4	83.7	90.4	114.7	105.9	99.8	108.4
May 2016	94.6	95.3	90.0	95.7	120.0	112.8	107.2	113.4
June 2016	109.7	107.8	102.4	105.6	121.6	114.9	121.6	122.9
July 2016	94.4	91.8	86.1	92.8	124.1	113.9	117.3	119.4
August 2016	96.8	96.8	89.4	96.3	119.7	112.6	115.9	118.2
September 2016	95.0	97.3	87.6	92.7	125.6	118.3	115.9	116.5
October 2016	97.1	98.1	94.1	95.4	128.3	119.5	115.9	118.2
Premium unleaded gasoline at self service filling stations								
October 2015	119.5	119.3	115.9	122.4	133.1	125.2	130.9	142.9
November 2015	117.0	115.2	107.0	116.8	141.3	132.8	125.0	136.7
December 2015	104.1	103.4	99.3	104.1	139.5	130.4	113.6	135.0
January 2016	95.4	93.6	91.2	97.7	127.3	120.1	109.2	126.8
February 2016	88.4	89.5	80.4	91.3	122.7	114.8	105.4	112.7
March 2016	102.5	100.4	96.4	103.4	129.6	123.0	107.3	115.0
April 2016	104.4	105.6	102.1	108.8	131.8	122.6	111.7	118.0
May 2016	111.3	111.2	109.0	114.3	136.8	126.0	119.3	119.8
June 2016	123.9	124.3	121.2	123.3	138.7	131.7	131.7	130.9
July 2016	110.2	108.2	105.0	111.5	141.2	131.4	128.5	129.9
August 2016	113.0	112.6	107.9	114.7	137.6	130.6	126.3	128.7
September 2016	111.3	113.5	105.8	110.0	143.8	136.2	126.5	126.2
October 2016	113.2	114.5	111.0	113.6	146.6	137.7	126.5	126.5
Household heating fuel								
October 2015	98.6	98.2	.	.	102.5	113.1	104.7	100.3
November 2015	94.1	95.2	.	.	104.2	113.2	106.1	99.4
December 2015	91.6	87.1	.	.	93.0	109.2	103.6	94.5
January 2016	83.0	78.8	.	.	83.6	103.9	101.2	90.0
February 2016	78.1	74.1	.	.	81.2	101.1	88.6	84.7
March 2016	81.1	79.2	.	.	84.7	102.1	89.6	82.1
April 2016	81.6	77.4	.	.	85.3	104.2	89.3	84.4
May 2016	84.5	83.4	.	.	94.5	104.2	90.0	84.4
June 2016	90.0	91.7	.	.	105.0	106.7	91.0	89.3
July 2016	89.1	89.3	.	.	108.1	106.7	90.3	92.1
August 2016	88.2	88.6	.	.	103.0	106.7	89.6	92.1
September 2016	88.8	89.1	.	.	104.1	106.7	95.6	92.1
October 2016	95.7	99.9	.	.	108.8	110.1	101.5	99.4

Note(s): See Table A for complete list of vector numbers.

The Consumer Price Index – October 2016

Table 14
Average retail prices, monthly, Canada

	CANSIM vector number	August 2016	September 2016	October 2016
		dollars ¹		
Round steak, 1 kilogram	(v735165)	18.32	17.85	18.08
Sirloin steak, 1 kilogram	(v735176)	23.75	23.99	23.74
Prime rib roast, 1 kilogram	(v735187)	31.24	31.36	30.52
Blade roast, 1 kilogram	(v735198)	16.30	15.85	16.13
Stewing beef, 1 kilogram	(v735209)	16.53	16.10	16.17
Ground beef, regular, 1 kilogram	(v735220)	12.19	12.40	12.36
Pork chops, 1 kilogram	(v735221)	12.60	12.55	12.29
Chicken, 1 kilogram	(v735223)	7.49	7.46	7.53
Bacon, 500 grams	(v735166)	6.91	6.86	6.58
Wieners, 450 grams	(v735167)	4.10	4.31	4.48
Canned sockeye salmon, 213 grams	(v735168)	4.42	4.37	4.23
Homogenized milk, 1 litre	(v735169)	2.45	2.46	2.47
Partly skimmed milk, 1 litre	(v735170)	2.30	2.31	2.30
Butter, 454 grams	(v735171)	4.92	4.83	4.66
Processed cheese food slices, 250 grams	(v735172)	2.67	2.69	2.83
Evaporated milk, 385 millilitres	(v735173)	1.92	1.86	1.87
Eggs, 1 dozen	(v735174)	3.35	3.37	3.08
Bread, 675 grams	(v735175)	2.99	2.92	2.86
Soda crackers, 450 grams	(v735177)	3.20	3.09	3.12
Macaroni, 500 grams	(v735178)	1.57	1.50	1.46
Flour, 2.5 kilograms	(v735179)	5.06	4.88	4.72
Corn flakes, 675 grams	(v735180)	5.03	4.79	4.71
Apples, 1 kilogram	(v735181)	4.48	4.38	3.99
Bananas, 1 kilogram	(v735182)	1.62	1.59	1.60
Grapefruits, 1 kilogram	(v735183)	3.76	3.88	4.24
Oranges, 1 kilogram	(v735184)	3.43	3.40	3.40
Apple juice, canned, 1.36 litres	(v735185)	2.12	2.06	2.04
Orange juice, tetra-brick, 1 litre	(v735186)	4.08	4.01	3.83
Carrots, 1 kilogram	(v735189)	2.22	1.96	1.77
Celery, 1 kilogram	(v735190)	2.26	2.16	2.08
Mushrooms, 1 kilogram	(v735191)	8.71	8.64	8.75
Onions, 1 kilogram	(v735192)	2.70	2.12	1.83
Potatoes, 4.54 kilograms	(v735193)	7.13	6.44	6.17
French fried potatoes, frozen, 1 kilogram	(v735194)	2.69	2.58	2.62
Baked beans, canned, 398 millilitres	(v735195)	1.31	1.27	1.36
Tomatoes, canned, 796 millilitres	(v735196)	1.59	1.58	1.56
Tomato juice, canned, 1.36 litres	(v735197)	2.50	2.47	2.34
Ketchup, 1 litre	(v735199)	3.43	3.31	3.31
Sugar, white, 2 kilograms	(v735200)	2.88	2.80	2.72
Coffee, roasted, 300 grams	(v735201)	6.33	6.21	6.23
Coffee, instant, 200 grams	(v735202)	6.93	6.68	6.83
Tea (72 bags)	(v735203)	4.68	4.46	4.51
Cooking or saled oil, 1 litre	(v735204)	4.18	3.96	3.94
Soup, canned, 284 millilitres	(v735205)	1.15	1.11	1.11
Baby food, 128 millilitres	(v735206)	0.95	0.95	0.95
Peanut butter, 500 grams	(v735207)	3.56	3.42	3.42
Fruit flavoured crystals, 2.25 litres	(v735208)	1.98	1.90	1.87
Soft drinks, cola type, 2 litres	(v735210)	2.08	2.04	2.02
Soft drinks, lemon-lime type, 2 litres	(v735211)	1.96	1.92	1.88
Paper towels (2 rolls)	(v735213)	2.66	2.63	2.65
Facial tissue (200 tissues)	(v735214)	2.77	2.75	2.78
Bathroom tissue (4 rolls)	(v735215)	2.67	2.53	2.59
Shampoo, 300 millilitres	(v735216)	3.86	3.87	3.81
Deodorant, 60 grams	(v735217)	4.55	4.49	4.57
Toothpaste, 100 millilitres	(v735218)	2.61	2.68	2.75
Cigarettes (200)	(v735219)	101.37	101.78	102.48
Regular, unleaded gasoline at self-service stations, cents per litre	(v41838376)	101.9	102.8	106.7

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

The Consumer Price Index – October 2016

Table 15
Inter-city indexes of price differentials, as of October 2015, of consumer goods and services

	Canada CPI weight ¹	St. John's, Newfoundland and Labrador	Charlottetown and Summerside, Prince Edward Island	Halifax, Nova Scotia	Saint John, New Brunswick	Montréal, Quebec
	%	combined city average=100				
All-items	100.0	98	95	101	95	94
Food	16.4	108	105	103	107	100
Food purchased from stores	.	107	109	106	109	101
Meat, poultry and fish	.	102	111	108	111	101
Dairy products and eggs	.	106	101	100	101	104
Bakery and other cereal products	.	99	105	102	105	102
Fruit and vegetables	.	119	117	110	118	99
Other food purchased from stores ²	.	105	106	104	103	98
Food purchased from restaurants	.	110	96	97	103	98
Shelter	26.8	91	82	98	77	85
Rented accommodation	.	76	65	83	59	81
Owned accommodation	.	85	72	89	70	88
Water, fuel and electricity	.	135	141	153	130	85
Household operations, furnishings and equipment	13.1	103	102	102	100	96
Household operations	.	103	102	104	101	94
Household furnishings and equipment	.	102	100	99	97	103
Clothing and footwear	6.1	101	101	102	101	102
Transportation	19.1	99	92	95	94	101
Private transportation	.	99	90	94	92	101
Purchase of passenger vehicles	.	101	102	103	101	103
Gasoline	.	99	98	95	94	107
Other private transportation	.	96	71	83	80	97
Public transportation	.	100	100	100	106	100
Health and personal care	4.7	96	99	103	99	99
Health care	.	97	100	105	96	98
Personal care	.	95	98	101	103	100
Recreation, education and reading	10.9	87	101	107	103	83
Recreation	.	103	100	104	100	99
Education and reading	.	60	102	112	109	56
Alcoholic beverages and tobacco products	2.9	110	113	114	106	95
Alcoholic beverages	.	107	106	108	104	99
Tobacco products and smokers' supplies	.	116	124	123	110	89

The Consumer Price Index – October 2016

Table 15 – continued

Inter-city indexes of price differentials, as of October 2015, of consumer goods and services

	Canada CPI weight ¹	Ottawa, Ontario	Toronto, Ontario	Winnipeg, Manitoba	Regina, Saskatchewan	Edmonton, Alberta	Vancouver, British Columbia
	%	combined city average=100					
All-Items	100.0	103	109	95	99	101	104
Food	16.4	101	101	101	101	98	101
Food purchased from stores	.	103	100	99	102	98	101
Meat, poultry and fish	.	104	99	96	103	100	99
Dairy products and eggs	.	104	102	95	100	95	98
Bakery and other cereal products	.	98	97	102	103	101	103
Fruit and vegetables	.	103	97	101	105	100	105
Other food purchased from stores ²	.	104	102	102	99	95	101
Food purchased from restaurants	.	97	103	105	99	96	101
Shelter	26.8	108	119	89	100	111	114
Rented accommodation	.	103	117	84	88	109	118
Owned accommodation	.	106	114	93	96	113	116
Water, fuel and electricity	.	121	136	88	130	110	98
Household operations, furnishings and equipment	13.1	105	107	95	94	99	105
Household operations	.	107	109	94	93	101	106
Household furnishings and equipment	.	100	101	100	98	92	100
Clothing and footwear	6.1	101	100	100	98	95	100
Transportation	19.1	97	107	97	95	97	96
Private transportation	.	95	107	97	94	96	97
Purchase of passenger vehicles	.	101	101	100	98	93	100
Gasoline	.	93	96	99	98	94	110
Other private transportation	.	87	121	91	88	102	85
Public transportation	.	109	109	100	98	98	89
Health and personal care	4.7	104	104	99	103	98	99
Health care	.	104	104	96	107	103	98
Personal care	.	103	104	101	99	92	99
Recreation, education and reading	10.9	106	112	88	105	99	103
Recreation	.	100	103	97	101	96	103
Education and reading	.	115	128	74	113	105	104
Alcoholic beverages and tobacco products	2.9	97	97	115	112	108	101
Alcoholic beverages	.	98	98	106	106	107	100
Tobacco products and smokers' supplies	.	95	97	130	122	110	102

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" and "User information - Note to users" sections and Table B for complete list of vector numbers.

Explanatory notes for tables

Table 1 The Consumer Price Index, major components and special aggregates, Canada, not seasonally adjusted

1. 2013 Consumer Price Index (CPI) basket weights at December 2014 prices, Canada.
2. Figures may not add to 100% due to rounding.
3. The Bank of Canada's core index excludes eight of the Consumer Price Index's most volatile components (fruit, fruit preparations and nuts; vegetables and vegetable preparations; mortgage interest cost; natural gas; fuel oil and other fuels; gasoline; inter-city transportation; and tobacco products and smokers' supplies) as well as the effects of changes in indirect taxes on the remaining components. For additional information on the core index, please consult the Bank of Canada website: www.bankofcanada.ca/rates/indicators/key-variables/inflation-control-target/.

Table 2 The Consumer Price Index, major components and special aggregates, Canada, seasonally adjusted

1. 2013 Consumer Price Index (CPI) basket weights at December 2014 prices, Canada.
2. A seasonally adjusted series is one from which seasonal movements have been eliminated. Each month, the previous month's seasonally adjusted index is subject to revision. On an annual basis, the seasonally adjusted values for the last three years are revised with the January data release. Users employing Consumer Price Index data for indexation purposes are advised to use the unadjusted indexes. For more information on the availability and uses of seasonally adjusted CPI data, please see the *Definitions, data sources and methods* section of survey 2301.
3. The Bank of Canada's core index excludes eight of the Consumer Price Index's most volatile components (fruit, fruit preparations and nuts; vegetables and vegetable preparations; mortgage interest cost; natural gas; fuel oil and other fuels; gasoline; inter-city transportation; and tobacco products and smokers' supplies) as well as the effects of changes in indirect taxes on the remaining components. For additional information on the core index, please consult the Bank of Canada website: www.bankofcanada.ca/rates/indicators/key-variables/inflation-control-target/.

Table 3 The Consumer Price Index, provinces, Whitehorse, Yellowknife and Iqaluit, not seasonally adjusted

1. Data for Iqaluit are on a December 2002=100 base (200212=100) and the Standard Geographical Classification (SGC) 2001. Previous to April 1, 1999, the town of Iqaluit formed part of the Northwest Territories. On April 1, 1999, the town of Iqaluit formed part of the newly-created territory of Nunavut.

Table 4 The Consumer Price Index, major components and selected sub-groups, Canada, not seasonally adjusted

Table 4-7

1. From April 2006, Statistics Canada changed its implementation of the price index formula used for traveller accommodation. As a result, data from April 2006 are not strictly comparable to earlier time periods.

Table 5 The Consumer Price Index for Canada, All-items CPI, not seasonally adjusted, historical data

1. The annual average index is calculated as the average of the published 12 individual monthly indexes, rounded to one decimal place. Percentage changes between the annual average indexes are calculated based on these published rounded numbers. Between May 2007 and September 2007, the annual average percentage changes in Table 5 were calculated based on annual average indexes that were not rounded. As a result, some percentage changes were different by +/- 0.1 from the official percentage change. This problem only affected the annual average column of Table 5.

Table 6 The Bank of Canada's core index, not seasonally adjusted, historical data

1. The Bank of Canada's core index excludes eight of the Consumer Price Index's most volatile components (fruit, fruit preparations and nuts; vegetables and vegetable preparations; mortgage interest cost; natural gas; fuel oil and other fuels; gasoline; inter-city transportation; and tobacco products and smokers' supplies) as well as the effects of changes in indirect taxes on the remaining components. For additional information on the core index, please consult the Bank of Canada website: www.bankofcanada.ca/rates/indicators/key-variables/inflation-control-target/.
2. The annual average index is calculated as the average of the published 12 individual monthly indexes, rounded to one decimal place. Percentage changes between the annual average indexes are calculated based on these published rounded numbers.

Table 7 The Consumer Price Index for Canada, major components and special aggregates, not seasonally adjusted, historical data

1. Goods are physical or tangible commodities usually classified according to their life span into non-durable goods, semi-durable goods and durable goods. Non-durable goods are those goods that can be used up entirely in less than a year, assuming normal usage. For example, fresh food products, disposable cameras and gasoline are non-durable goods. Semi-durable goods are those goods that may last less than 12 months or greater than 12 months depending on the purpose to which they are put. For example, clothing, footwear and household textiles are semi-durable goods. Durable goods are those goods which may be used repeatedly or continuously over more than a year, assuming normal usage. For example, cars, audio and video equipment and furniture are durable goods.
2. A service in the Consumer Price Index (CPI) is characterized by valuable work performed by an individual or organization on behalf of a consumer, for example, car tune-ups, haircuts and city public transportation. Transactions classified as a service may include the cost of goods by their nature. Examples include food in restaurant food services and materials in clothing repair services.
3. The special aggregate "energy" includes: "electricity", "natural gas", "fuel oil and other fuels", "gasoline", and "fuel, parts and accessories for recreational vehicles".
4. The annual index level is the average of the 12 individual monthly indexes.

Table 8 Annual average percentage changes for the Consumer Price Index**Table 8-1**

1. The annual index level is the average of the 12 individual monthly indexes. The percentage change for a given calendar year is calculated using the annual average indexes.

Table 8-2

1. The annual index level is the average of the 12 individual monthly indexes. The percentage change for a given calendar year is calculated using the annual average indexes.
2. Data for Iqaluit are on a December 2002=100 base (200212=100) and the Standard Geographical Classification (SGC) 2001. Previous to April 1, 1999, the town of Iqaluit formed part of the Northwest Territories. On April 1, 1999, the town of Iqaluit formed part of the newly-created territory of Nunavut.

Table 9 The Consumer Price Index, major components, selected sub-groups and special aggregates, provinces, Whitehorse and Yellowknife, not seasonally adjusted**Tables 9-1, 9-2, 9-3, 9-4, 9-5, 9-6, 9-7, 9-8, 9-9, 9-10 and 9-11**

1. The special aggregate "energy" includes: "electricity", "natural gas", "fuel oil and other fuels", "gasoline", and "fuel, parts and accessories for recreational vehicles".

Table 9-12

1. The special aggregate "energy" includes: "electricity", "natural gas", "fuel oil and other fuels", "gasoline", and "fuel, parts and accessories for recreational vehicles".
2. Part of the increase first recorded in the shelter index for Yellowknife for December 2004 inadvertently reflected rent increases that actually occurred earlier. As a result, the change in the shelter index was overstated in December 2004, and was understated in the previous two years. The shelter index series for Yellowknife has been corrected from December 2002. In addition, the Yellowknife All-Items Consumer Price Index (CPI) and some Yellowknife special aggregate index series have also changed. Data for Canada and all other provinces and territories were not affected.

Table 10 The All-items Consumer Price Index, provinces, Whitehorse, Yellowknife and Iqaluit, not seasonally adjusted, historical data

1. Data for Iqaluit are on a December 2002=100 base (200212=100) and the Standard Geographical Classification (SGC) 2001. Previous to April 1, 1999, the town of Iqaluit formed part of the Northwest Territories. On April 1, 1999, the town of Iqaluit formed part of the newly-created territory of Nunavut.
2. The annual index level is the average of the 12 individual monthly indexes.

Table 11 The Consumer Price Index and selected sub-groups, by city, not seasonally adjusted

1. With the introduction of the 1992 basket in January 1995, emphasis was shifted from city data to provincial data. City all-items series were continued since many users had come to rely on this service, but the method of calculation was changed. Shelter indexes are calculated for each city. This recognizes the importance of shelter in the basket, the significant and persistent differences in price movements between cities, and the availability of local data. For the other seven major components, the movement of the provincial counterpart is used except in the cases of Montréal, Toronto, and Vancouver, where a sub-provincial counterpart is used. The major components are aggregated using the city's expenditure pattern to arrive at each city's all-items index.
2. Formerly Ottawa (Ottawa-Gatineau, Ontario part), represents Ottawa only.

Table 12 The All-items Consumer Price Index by city, not seasonally adjusted, historical data

1. With the introduction of the 1992 basket in January 1995, emphasis was shifted from city data to provincial data. City all-items series were continued since many users had come to rely on this service, but the method of calculation was changed. Shelter indexes are calculated for each city. This recognizes the importance of shelter in the basket, the significant and persistent differences in price movements between cities, and the availability of local data. For the other seven major components, the movement of the provincial counterpart is used except in the cases of Montréal, Toronto, and Vancouver, where a sub-provincial counterpart is used. The major components are aggregated using the city's expenditure pattern to arrive at each city's all-items index.
2. The annual index level is the average of the 12 individual monthly indexes.
3. Formerly Ottawa (Ottawa-Gatineau, Ontario part), represents Ottawa only.

Table 14 Average retail prices, monthly, Canada

1. Prices are expressed in dollars, except for the price of gasoline which is expressed in cents per litre.

Average retail prices for food, household supplies, personal care items, cigarettes and gasoline

Table 14 shows, for the current month and the two previous months, average prices for selected food, household supplies, personal care items, cigarettes and for gasoline.

Prices for these items are collected as part of the regular monthly Consumer Price Index (CPI) survey. Prices for the selected food, household supply and personal care items are observed in food supermarkets and drug stores, while prices for cigarettes are collected in supermarkets, department stores, drug stores and tobacco shops. Prices for regular unleaded self-serve gasoline are collected at gas stations. In each geographic area defined for pricing purposes, the average prices of each product are weighted by the population of the area in question to calculate the average Canadian retail price of each product. For regular unleaded self-serve gasoline, average city prices are weighted by provincial volume supplied and cities' population to calculate the Canada average retail price.

Products that are priced can vary in quality between outlets or between geographic areas. Brands and outlets can also vary from month to month. Therefore, average prices may not necessarily be fully comparable from one month to another and should not be used as an appropriate measure of pure price change through time. A matched product and outlet sample is used for the CPI to determine the pure price movement of products through time.

Table 15 Inter-city indexes of price differentials, as of October 2015, of consumer goods and services**Purpose and Scope**

Table 15 shows estimates of price differences between 11 Canadian cities in all 10 provinces, as of October 2015. These estimates are based on a selection of products (goods and services) purchased by consumers in each of the 11 cities.

These estimates should not be interpreted as a measure of differences in the cost-of-living between cities. The indexes provide price comparisons for a selection of products only, and are not meant to give an exhaustive comparison of all goods and services purchased by consumers. Additionally, the shelter price concept used for these indexes is not conducive to making cost-of-living type comparisons between cities (see below).

Methodology

In order to produce optimal Inter-city indexes, product comparisons were initially made by pairing cities that are in close geographic proximity. The resulting price level comparisons were then extended to include comparisons between all of the cities, using a chaining procedure. The following initial pairings were used:

St. John's	Halifax
Charlottetown-Summerside	Halifax
Saint John	Halifax
Halifax	Ottawa
Montréal	Toronto
Ottawa	Toronto
Toronto	Winnipeg
Regina	Winnipeg
Edmonton	Winnipeg
Vancouver	Edmonton

Reliable Inter-city price comparisons require that the selected products be very similar across cities. This ensures that the variation in index levels between cities is due to pure price differences and not to differences in the attributes of the products, such as size and/or quality.

Within each city pair, product price quotes were matched on the basis of detailed descriptions. Whenever possible, products were matched by brand, quantity and with some regard for the comparability of retail outlets from which they were selected.

Additionally, the target prices for this study are final prices and as such, include all sales taxes and levies applied to consumer products within a city. This can be an important source of variation when explaining differences in inter-city price levels.

It should be noted that price data for the Inter-city indexes is drawn from the sample of monthly price data collected for the Consumer Price Index (CPI). Given that the CPI sample is optimized to produce accurate price comparisons through time, and not across regions, the number of matched price quotes between cities can be small. It should also be noted that, especially in periods when prices are highly volatile, the timing of the product price comparison can significantly affect city-to-city price relationships.

The weights used to aggregate the different product indexes within a city are based on the combined consumption expenditures of households living in the 11 cities tracked. As such, one set of weights is used for all 11 cities. Currently, 2013 expenditures are used to derive the weights. These expenditures are expressed in October 2015 prices.

The Inter-city index for a particular city is compared to the weighted average of all 11 cities, which is equal to 100. For example, an index value of 102 for a particular city means that prices for the measured commodities are 2% higher than the weighted, combined city average.

Additional Information on Shelter

Shelter prices were absent from the Inter-city index program prior to 1999 because of methodological and conceptual issues associated with their measurement. The diverse nature of shelter means that accurate matches between cities are often difficult to make.

To account for some of these difficulties, a rental equivalence approach is used to construct the Inter-city price indexes for owned accommodation. Such an approach uses market rents as an approximation to the cost of the shelter services consumed by homeowners in each city. It is important to note that this approach may not be suitable for the needs of all users. For instance, since the rental equivalence approach does not represent an out-of-pocket expenditure, the indexes should not be used for measuring differences in the purchasing power of homeowners across cities.

Footnotes for Table 15

1. The weights shown are rounded 2013 basket weights at December 2014 prices for Canada. They are provided for illustration only; the weights actually used are combined city weights with adjustments for price changes up until October 2015.
2. Includes the following subgroups: sugar and syrup, confectionery items, margarine, other edible fat and oil items, coffee, tea, condiments, spices and vinegar, soup, infant and junior foods, pre-cooked frozen food preparations, non-alcoholic beverages and all other food preparations.

Data quality, concepts and methodology

Definition

The Consumer Price Index (CPI) is an indicator of the changes in consumer prices experienced by the target population. The CPI measures price change by comparing, through time, the cost of a fixed basket of goods and services. The CPI basket is based on the expenditures of the target population in a certain reference period. A list of baskets and reference months is available in **The Canadian Consumer Price Index Reference Paper**, catalogue no. 62-553-X. Since a basket contains goods and services of unchanging or equivalent quantity and quality, the index reflects only pure price movements.

Separate CPIs are published for Canada, the ten provinces, Whitehorse, Yellowknife and Iqaluit. Some CPI information is also available for an additional sixteen urban centres. Since the CPI is a measure of price change from one time period to another, it cannot be used to indicate differences in price levels between provinces or urban centres.

Population coverage

The population targeted by the CPI consists of families and individuals living in urban and rural private households. For practical reasons, residents of the Territories outside Whitehorse, Yellowknife and Iqaluit are not represented by the index. Prior to January 1995, the target population consisted of private households in Canadian urban centres with a population of 30,000 or more.

Time base

The CPI compares, in percentage terms, prices in any given time period to prices in the official base period which, at present, is 2002=100. The official time base was changed from 1992=100 to 2002=100 starting with the CPI for May 2007. The change is strictly an arithmetic conversion which alters the index levels but leaves the percentage changes between any two periods intact, except for differences in rounding.

Percent versus index point changes

The movements of the indexes from one month to another are expressed as percent changes rather than changes in index points. Index point changes are affected by the level of the index which, in turn, depends on the time base of the particular index. The percentage change between any two time periods can be readily calculated by dividing the index point difference between the two time periods by the index for the earlier period and multiplying the result by one hundred.

Price coverage

The prices used in the CPI calculation are final prices, inclusive of excise and other indirect taxes paid by consumers. In particular, they include the Goods and Services Tax (GST), as well as provincial retail sales taxes wherever applicable. In regions where the GST and provincial retail sales taxes have been combined, the Harmonized Sales Tax (HST) is included. It follows that the CPI can change as a result of modifications to any of these taxes.

The selection of products and the outlets from which prices are collected is judgmental, other than for rents and traveler accommodation. The number of prices required for a given good or service depends on the importance and the nature of the product. The samples are designed to represent volume selling goods and services and outlets. The principal objective of the sample design is to ensure an informative, reliable and impartial picture of consumer inflation at the national and provincial levels.

The prices of most of the goods and services surveyed for the CPI are usually collected in the first two weeks of the reference month. Food prices are collected in the first three weeks, while gasoline prices are collected in four weeks of each month. Although prices for most CPI goods and services are collected monthly, prices for products having less frequent price changes (e.g. property taxes and electricity rates) are collected at intervals longer than one month. Special pricings are carried out where there is evidence that significant price changes have occurred between scheduled pricing periods.

Weights and linking

The CPI maintains fixed quantitative proportions (weights) between goods and services during the life of a given basket. The baskets are updated periodically to take into account changes in consumer expenditure patterns. In February 2015, with the release of the January 2015 CPI, the basket reflecting the 2013 expenditure patterns replaced the 2011 basket. The continuity of the CPI series is maintained by "linking" the corresponding indexes obtained from consecutive baskets.

The CPI is calculated as a weighted average of specified goods and services price indexes. The weights are derived from Survey of Household Spending data.

When reconstructing or re-aggregating published CPI series, the changes in weights and the linking procedures must be taken into account. For a description of the methodology required to reconstruct or re-aggregate CPI series, see *The Canadian Consumer Price Index Reference Paper*, catalogue no. 62-553-X (Occasional), or contact Consumer Prices Division.

Bank of Canada's core index

Starting with the October 2006 Consumer Price Index (CPI), Statistics Canada produces and disseminates the Bank of Canada's core index as defined by the Bank of Canada.

The Bank of Canada's core index excludes eight of the Consumer Price Index's most volatile components (fruit, fruit preparations and nuts; vegetables and vegetable preparations; mortgage interest cost; natural gas; fuel oil and other fuels; gasoline; inter-city transportation; and tobacco products and smokers' supplies) as well as the effects of changes in indirect taxes on the remaining components. For additional information on the core index, please consult the Bank of Canada website: www.bankofcanada.ca/rates/indicators/key-variables/inflation-control-target/.

Statistics Canada also calculates, on behalf of the Bank of Canada, a seasonally adjusted core index. This series is available through *CANSIM*, Statistics Canada's official database, or by contacting us through the means mentioned on the inside cover of this publication.

Whitehorse, Yellowknife and Iqaluit indexes

The relatively small size of the housing market in these three cities makes it difficult to construct reliable price indexes for new houses. To compensate, the price movements of rental accommodation are used to approximate the price movements of new houses. The rent information itself is collected using different pricing frequencies and collection methods than in the rest of the country. Because of these problems, the indexes for Rented Accommodation and Owned Accommodation are not published for these three cities. Further, the all-items indexes published for these three cities are not strictly comparable with the same indexes for the provinces or the other sixteen cities.

Calculation of city indexes

With the introduction of the 1992 basket, emphasis was shifted from city data to provincial data. City all-items series were continued since many users had come to rely on this service, but the method of calculation was changed. Shelter indexes are calculated for each city. This recognizes the importance of Shelter in the basket, the significant and persistent differences in price movements between cities, and the availability of local data. For the other seven major components, the movement of the provincial counterpart (or, in the cases of Montréal, Toronto, and Vancouver, a sub-provincial counterpart) is used. The major components are aggregated using the city's expenditure pattern to arrive at each city's all-items index.

Seasonal adjustment

A seasonally adjusted series is one from which seasonal movements have been eliminated. Seasonal movements are defined as those which are caused by regular annual events such as variations in climate and regular institutional events such as vacations and statutory holidays. Seasonally adjusted series are calculated using Statistics Canada's X-12 ARIMA program. Time series with no detectable seasonal movements remain unchanged from the official series. The official unadjusted series for the all-items index, the Bank of Canada's core index, each of the eight major component indexes and three special aggregates (all-items excluding food, all-items excluding food and energy and all-items excluding eight of the most volatile components [Bank of Canada definition]) are seasonally adjusted independently.

Each month, the previous month's seasonally adjusted index is subject to revision. On an annual basis, the seasonally adjusted values for the last three years are revised with the January data release. Since these revisions can lead to changes in both the levels and movements of the indexes, users employing the CPI for indexation purposes are advised to use the unadjusted indexes.

Appendix I

Concordance tables

Table A
Vector numbers for the average retail prices for gasoline and fuel oil, by urban centre

	St. John's, N.L.	Charlottetown and Summerside, P.E.I.	Halifax, N.S.	Saint John, N.B.	Québec, Que.	Montréal, Que.	Ottawa, Ont.	Toronto, Ont.	Thunder Bay, Ont.	Winnipeg, Man.
Regular unleaded gasoline at self service filling stations	(v735082)	(v735092)	(v735093)	(v735084)	(v735095)	(v735096)	(v735097)	(v735098)	(v735099)	(v735083)
Premium unleaded gasoline at self service filling stations	(v735100)	(v735110)	(v735111)	(v735112)	(v735113)	(v735114)	(v735115)	(v735116)	(v735117)	(v735101)
Household heating fuel	(v735149)	(v735157)	(v735158)	(v735159)	(v735160)	(v735161)	(v735162)	(v735163)	(v735164)	(v735150)
	Regina, Sask.	Saskatoon, Sask.	Edmonton, Alta.	Calgary, Alta.	Vancouver, B.C.	Victoria, B.C.	Whitehorse, Y.T.	Yellowknife, N.W.T.		
Regular unleaded gasoline at self service filling stations	(v735084)	(v735085)	(v735086)	(v735087)	(v735088)	(v735089)	(v735090)	(v735091)		
Premium unleaded gasoline at self service filling stations	(v735102)	(v735103)	(v735104)	(v735105)	(v735106)	(v735107)	(v735108)	(v735109)		
Household heating fuel	(v735151)	(v735152)			(v735153)	(v735154)	(v735155)	(v735156)		

The Consumer Price Index – October 2016

Table B
Vector numbers of the inter-city indexes of price differentials of consumer goods and services

	St. John's, Newfoundland and Labrador	Charlottetown and Summerside, Prince Edward Island	Halifax, Nova Scotia	Saint John, New Brunswick	Montréal, Quebec
All-items	(v15939841)	(v15939869)	(v15939897)	(v15939925)	(v15939953)
Food	(v15939842)	(v15939870)	(v15939898)	(v15939926)	(v15939954)
Food purchased from stores	(v15939843)	(v15939871)	(v15939899)	(v15939927)	(v15939955)
Meat, poultry and fish	(v15939844)	(v15939872)	(v15939900)	(v15939928)	(v15939956)
Dairy products and eggs	(v15939845)	(v15939873)	(v15939901)	(v15939929)	(v15939957)
Bakery and other cereal products	(v15939846)	(v15939874)	(v15939902)	(v15939930)	(v15939958)
Fruit and vegetables	(v15939847)	(v15939875)	(v15939903)	(v15939931)	(v15939959)
Other food purchased from stores	(v15939848)	(v15939876)	(v15939904)	(v15939932)	(v15939960)
Food purchased from restaurants	(v15939849)	(v15939877)	(v15939905)	(v15939933)	(v15939961)
Shelter	(v15939850)	(v15939878)	(v15939906)	(v15939934)	(v15939962)
Rented accommodation	(v21580949)	(v21580952)	(v21580955)	(v21580958)	(v21580961)
Owned accommodation	(v21580950)	(v21580953)	(v21580956)	(v21580959)	(v21580962)
Water, fuel and electricity	(v21580951)	(v21580954)	(v21580957)	(v21580960)	(v21580963)
Household operations, furnishings and equipment	(v15939851)	(v15939879)	(v15939907)	(v15939935)	(v15939963)
Household operations	(v15939852)	(v15939880)	(v15939908)	(v15939936)	(v15939964)
Household furnishings and equipment	(v15939853)	(v15939881)	(v15939909)	(v15939937)	(v15939965)
Clothing and footwear	(v15939854)	(v15939882)	(v15939910)	(v15939938)	(v15939966)
Transportation	(v15939855)	(v15939883)	(v15939911)	(v15939939)	(v15939967)
Private transportation	(v15939856)	(v15939884)	(v15939912)	(v15939940)	(v15939968)
Purchase of passenger vehicles	(v15939857)	(v15939885)	(v15939913)	(v15939941)	(v15939969)
Gasoline	(v15939858)	(v15939886)	(v15939914)	(v15939942)	(v15939970)
Other private transportation	(v15939859)	(v15939887)	(v15939915)	(v15939943)	(v15939971)
Public transportation	(v15939860)	(v15939888)	(v15939916)	(v15939944)	(v15939972)
Health and personal care	(v15939861)	(v15939889)	(v15939917)	(v15939945)	(v15939973)
Health care	(v15939862)	(v15939890)	(v15939918)	(v15939946)	(v15939974)
Personal care	(v43975161)	(v43975162)	(v43975163)	(v43975164)	(v43975165)
Recreation, education and reading	(v15939865)	(v15939893)	(v15939921)	(v15939949)	(v15939977)
Recreation	(v43975172)	(v43975173)	(v43975174)	(v43975175)	(v43975176)
Education and reading	(v43975183)	(v43975184)	(v43975185)	(v43975186)	(v43975187)
Alcoholic beverages and tobacco products	(v15939866)	(v15939894)	(v15939922)	(v15939950)	(v15939978)
Alcoholic beverages	(v15939867)	(v15939895)	(v15939923)	(v15939951)	(v15939979)
Tobacco products and smokers' supplies	(v15939868)	(v15939896)	(v15939924)	(v15939952)	(v15939980)

The Consumer Price Index – October 2016

Table B – continued

Vector numbers of the inter-city indexes of price differentials of consumer goods and services

	Ottawa, Ontario	Toronto, Ontario	Winnipeg, Manitoba	Regina, Saskatchewan	Edmonton, Alberta	Vancouver, British Columbia
All-items	(v15939981)	(v15940069)	(v15940037)	(v15940065)	(v15940093)	(v15940121)
Food	(v15939982)	(v15940010)	(v15940038)	(v15940066)	(v15940094)	(v15940122)
Food purchased from stores	(v15939983)	(v15940011)	(v15940039)	(v15940067)	(v15940095)	(v15940123)
Meat, poultry and fish	(v15939984)	(v15940012)	(v15940040)	(v15940068)	(v15940096)	(v15940124)
Dairy products and eggs	(v15939985)	(v15940013)	(v15940041)	(v15940069)	(v15940097)	(v15940125)
Bakery and other cereal products	(v15939986)	(v15940014)	(v15940042)	(v15940070)	(v15940098)	(v15940126)
Fruit and vegetables	(v15939987)	(v15940015)	(v15940043)	(v15940071)	(v15940099)	(v15940127)
Other food purchased from stores	(v15939988)	(v15940016)	(v15940044)	(v15940072)	(v15940100)	(v15940128)
Food purchased from restaurants	(v15939989)	(v15940017)	(v15940045)	(v15940073)	(v15940101)	(v15940129)
Shelter	(v15939990)	(v15940018)	(v15940046)	(v15940074)	(v15940102)	(v15940130)
Rented accommodation	(v21580964)	(v21580967)	(v21580970)	(v21580973)	(v21580976)	(v21580979)
Owned accommodation	(v21580965)	(v21580968)	(v21580971)	(v21580974)	(v21580977)	(v21580980)
Water, fuel and electricity	(v21580966)	(v21580969)	(v21580972)	(v21580975)	(v21580978)	(v21580981)
Household operations, furnishings and equipment	(v15939991)	(v15940019)	(v15940047)	(v15940075)	(v15940103)	(v15940131)
Household operations	(v15939992)	(v15940020)	(v15940048)	(v15940076)	(v15940104)	(v15940132)
Household furnishings and equipment	(v15939993)	(v15940021)	(v15940049)	(v15940077)	(v15940105)	(v15940133)
Clothing and footwear	(v15939994)	(v15940022)	(v15940050)	(v15940078)	(v15940106)	(v15940134)
Transportation	(v15939995)	(v15940023)	(v15940051)	(v15940079)	(v15940107)	(v15940135)
Private transportation	(v15939996)	(v15940024)	(v15940052)	(v15940080)	(v15940108)	(v15940136)
Purchase of passenger vehicles	(v15939997)	(v15940025)	(v15940053)	(v15940081)	(v15940109)	(v15940137)
Gasoline	(v15939998)	(v15940026)	(v15940054)	(v15940082)	(v15940110)	(v15940138)
Other private transportation	(v15939999)	(v15940027)	(v15940055)	(v15940083)	(v15940111)	(v15940139)
Public transportation	(v15940000)	(v15940028)	(v15940056)	(v15940084)	(v15940112)	(v15940140)
Health and personal care	(v15940001)	(v15940029)	(v15940057)	(v15940085)	(v15940113)	(v15940141)
Health care	(v15940002)	(v15940030)	(v15940058)	(v15940086)	(v15940114)	(v15940142)
Personal care	(v43975166)	(v43975167)	(v43975168)	(v43975169)	(v43975170)	(v43975171)
Recreation, education and reading	(v15940005)	(v15940033)	(v15940061)	(v15940089)	(v15940117)	(v15940145)
Recreation	(v43975177)	(v43975178)	(v43975179)	(v43975180)	(v43975181)	(v43975182)
Education and reading	(v43975188)	(v43975189)	(v43975190)	(v43975191)	(v43975192)	(v43975193)
Alcoholic beverages and tobacco products	(v15940006)	(v15940034)	(v15940062)	(v15940090)	(v15940118)	(v15940146)
Alcoholic beverages	(v15940007)	(v15940035)	(v15940063)	(v15940091)	(v15940119)	(v15940147)
Tobacco products and smokers' supplies	(v15940008)	(v15940036)	(v15940064)	(v15940092)	(v15940120)	(v15940148)

**ONTARIO
SUPERIOR COURT OF JUSTICE**

Proceeding commenced at Toronto

AFFIDAVIT OF JASMINE RANDHAWA
(Sworn July 25th, 2018)

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Court File No.: CV-18-590105-00CP

ONTARIO
SUPERIOR COURT OF JUSTICE

BETWEEN:

LESLIE AUSTIN,

Plaintiff

- and -

**BELL CANADA, BELL MEDIA INC.,
EXPERTECH NETWORK INSTALLATION INC., and BELL MOBILITY INC.**
Defendants

Proceeding under the *Class Proceedings Act, 1992*

AFFIDAVIT OF PHILIP CROSS
(Sworn July 20, 2018)

I, Philip Cross, of the City of Ottawa, in the Province of Ontario, MAKE OATH
AND SAY:

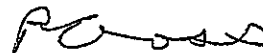
1. I have been retained by Koskie Minsky LLP and McKenzie Lake Lawyers LLP on behalf of their clients in these proceedings.
2. A copy of my report is attached as **Exhibit "A"**. A copy of my curriculum vitae is attached as an appendix to my report.
3. A copy of "The Consumer Price Index, Statistics Canada Catalogue no. 62-001-X. October 2016" which is referenced in my report is attached as **Exhibit "B"**.
4. A copy of "The Canadian Consumer Price Index Reference Paper. Statistics Canada Catalogue No 62-553-X" which is referenced in my report is attached as **Exhibit "C"**.

5. Attached as Exhibit "D" is a copy of my Acknowledgement of Expert's Duty.

SWORN BEFORE ME at the City of Ottawa,
in the Province of Ontario this 20th day of
July, 2018.

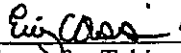


A Commissioner for taking Affidavits (or as may be)



PHILIP CROSS

This is Exhibit "A" referred to in the
Affidavit of Philip Cross
sworn before me, this 20th day of July, 2018.



Commissioner for Taking Affidavits

Background for Philip Cross

I worked at Statistics Canada for 36 years from 1976 to 2012, rising to the position of Chief Economic Analyst before leaving government to work at various universities and think tanks across the country. Part of my job over the last 15 years was to review all the public statements by Statistics Canada about the state of the economy as they were presented to senior management's Policy Committee (comprising the Chief Statistician and six Assistant Chief Statisticians) before publication in *The Daily*, Statistics Canada's official release vehicle. The review was to check for their accuracy, coherence, relevance as well as ensuring they met Statistics Canada's standards for impartiality. One of the series I reviewed was the monthly Consumer Price Index. During the years of working with the analysts in the CPI preparing the monthly text and data, communications experts in *The Daily* and witnessing feedback from Policy Committee, I developed an in-depth understanding of what and how Statistics Canada determines and publishes the CPI data and how it communicates with the public about the CPI. I also demonstrated an in-depth knowledge of using the CPI data in my monthly write-ups of the economy published in the *Canadian Economic Observer*, Statistics Canada's flagship publication for economic statistics.

I was retained by Koskie Minsky to answer the following questions.

1. What is the Consumer Price Index?

The Consumer Price Index is Statistics Canada's official measure of change in the cost of living for the average Canadian. It measures the cost of a specific basket of goods and services. Changes in the cost of that basket over two periods of time reflect changes in the prices of the various goods and services, or what is commonly called the inflation rate. The CPI is widely used to index government tax and transfer systems and an array of contracts and pensions for changes in prices.

The monthly CPI is published within a couple of weeks of the reference month. For example, the estimate for the October 2016 CPI was released on November 18, 2016. The results at the national level and its major components as well as provincial totals are diffused in *The Daily*.¹ More detailed results, especially for the provinces and the major cities in Canada, are released the same day in the monthly publication titled *The Consumer Price Index*.² Statistics Canada determines and publishes in *The Daily* the monthly percentage change and the year-over-year percent change every month for the reference month; for October 2016, for example, it determines and publishes the percent change between September 2016 and October 2016, and the year-over-year percent change between October 2015 and October 2016. Once a year it determines and publishes the annual percent change between the average level of the CPI for the 12 months of a calendar year (such as 2016) compared with the average level for the 12 months of the previous calendar year (in this case, 2015).

¹ Statistics Canada, *The Daily*, Friday November 18, 2016. Available at: <http://www.statcan.gc.ca/daily-quotidien/161118/dq161118a-eng.htm>.

² *The Consumer Price Index*. Statistics Canada Catalogue no. 62-001-X. Available at: <http://www.statcan.gc.ca/pub/62-001-x/62-001-x2016010-eng.pdf>.

2. What is the annual percentage increase of the CPI as determined by Statistics Canada? How are percentage increases calculated and are they rounded to one decimal place? When and how are they published?

Statistics Canada's determination and publication of the inflation rate is clear and unambiguous. For October 2016, the 1.5% inflation rate was determined by dividing the level of the CPI in October 2016 by the level of the CPI in October 2015. In October 2016, the published level of the CPI for Canada was 129.1; in October 2015 the level was 127.2. This yields a year over year percent change of 1.49371%, which rounds to 1.5%. Statistics Canada only publishes the level of the CPI and the inflation rate rounded to one decimal point.

Statistics Canada published in *The Daily*, its official release vehicle, on Friday November 18, 2016 that "The Consumer Price Index (CPI) rose 1.5% on a year-over-year basis in October."³ The determination of a 1.5% year-over-year increase in the CPI is confirmed in main table in the monthly publication for the CPI released on the same date.⁴

For the reasons set out below, Statistics Canada has an official policy of always determining and publishing the level of the CPI rounded to one decimal point. It does so because this is the convention among most statistical agencies, notably for Euro Stats, the official statistical agency of the European Union (and most member nations such as the UK and Norway), Australia, New Zealand and Japan⁵. Specifically, Statistics Canada states "However, consistent with international practice, indices are rounded to one decimal place when they are published. Percentage changes (monthly, 12-month and annual averages) in Statistics Canada publications are always calculated with the published rounded indices. They are also rounded to one decimal place. That way, users can always replicate the published percentage changes."⁶ The United States is a notable exception, publishing several decimal points for its CPI. The US is often an outlier when it comes to statistical practices; for example, the US data for retail sales includes restaurants, unlike Statistics Canada which includes restaurants in services. Even when measuring consumer prices, the US and Canada have much different approaches to measuring the cost of home ownership.

3. What is Statistics Canada's publicly disclosed rationale for the method regarding the determination and rounding of annual increases in the CPI?

Only one decimal point is significant because there is limited precision for some of the underlying price data. Some data, such as government administered duties, are fixed and can be calculated with a great deal of precision (tuition fees or hydro rates, for example). However, many prices in the economy have some uncertainty surrounding them. Food and clothing prices are based on a sample, and therefore do not cover every possible transaction or price quote. As Statistics Canada says in its official guide to the

³ Statistics Canada, *The Daily*, Friday November 18, 2016.

⁴ The Consumer Price Index. Statistics Canada Catalogue no. 62-001-X. October 2016, page 12.

⁵ For Japan's CPI data, see <http://www.stat.go.jp/english/data/cpi/1581-z.html>.

⁶ The Canadian Consumer Price Index Reference Paper. Statistics Canada Catalogue No 62-553-X, Section 2.24, page 17.

CPI, "As a sample-based statistic, the CPI, like all such statistics, cannot with 100% accuracy estimate the underlying (but unobserved) 'true' value it aims to measure."⁷

Another example of uncertainty about prices is auto purchases, where the actual transaction price will vary for most consumers depending on the exact package they purchase, the value they receive for their trade-in (if any) and their negotiating skill. All these will make the transaction price different from the manufacturer's suggested list price.

Statistics Canada publicly acknowledges a number of potential uncertainties in the Consumer Price Index. Besides sampling variance already discussed, over time there is statistical bias due to consumers "buying more of the products whose prices have fallen or risen less rapidly" (buying hamburger instead of steak when beef prices increase, for example).⁸ Meanwhile, it takes time for Statistics Canada to incorporate new goods and services into its survey of prices, which is particularly relevant for high tech goods.⁹ Even the opening of new outlets that sell to consumers (such as the arrival of large US department stores) requires a change in where Statistics Canada collects its sample of prices. Finally, Statistics Canada admits the possibility that "Clerical errors might occur" during the process of collecting price data.¹⁰

Statistics Canada openly and publicly acknowledges all these possible limitations to its CPI data. By doing so, it is telling users that when they use the CPI for indexation clauses in contracts, they are accepting the possibility that the estimates may not precisely reflect what prices are actually doing. If users believe the CPI is not as accurate a measure of consumer prices as they would like, they are always free to substitute some other measure. But once they accept using the CPI, they are accepting all the risks attached to its measurement. This is why Statistics Canada cautions that "Users are advised, therefore, to approach the CPI with discretion, especially when using it for purposes that lie outside of its main focus."¹¹

All these source of error or uncertainty mean that the data are not more accurate if expressed to more than one decimal point. In reality, because of the uncertainty surrounding the estimates, the CPI cannot be accurately measured to two decimal points, which is why Statistics Canada maintains a strict policy of only publishing CPI data to one decimal point.

Using two decimal points makes for an imprecise measure of the inflation rate

Since the level of consumer prices are published with only one decimal point, it is not possible to accurately calculate a percent change to two decimal points. It is easy to construct an example demonstrating why this is the case. In October 2016, the published level of the CPI for Canada was

⁷ The Canadian Consumer Price Index Reference Paper. Statistics Canada Catalogue No 62-553-X, section 9.2, page 51.

⁸ The Canadian Consumer Price Index Reference Paper. Statistics Canada Catalogue No 62-553-X, Section 9.22, page 54.

⁹ The Canadian Consumer Price Index Reference Paper. Statistics Canada Catalogue No 62-553-X, Section 9.13, page 52.

¹⁰ The Canadian Consumer Price Index Reference Paper. Statistics Canada Catalogue No 62-553-X, Section 9.17, page 53.

¹¹ The Canadian Consumer Price Index Reference Paper. Statistics Canada Catalogue No 62-553-X, Section 2.28, page 17.

129.1; in October 2015 the level was 127.2. This yields a year over year percent change of 1.49371%, which rounds to the published rate of 1.5%.

Using two decimal points, it is conceivable that the actual level of the CPI in October 2016 was as high as 129.14 (which rounds to the published 129.1) and the October 2015 level was as low as 127.16 (which rounds to the published 127.2). Dividing these two data points (129.14/127.16) yields a year over year change of 1.56%, which rounds to 1.6% instead of the published 1.5%. However, it is just as possible that the October 2016 level was as low as 129.05 (which also rounds to the published 129.1) and the October 2015 level was as high as 129.24 (which rounds to the published 129.2). Dividing these two data points (129.05/129.24) yields a year over year change of 1.42%, which rounds to 1.4% and not the official published rate of 1.5%.

The conclusion is that trying to calculate the annual increase of the CPI to a second decimal point immediately injects uncertainty into the annual inflation rate. This is what Statistics Canada wants to avoid when it discussed users always being able to replicate the published percentage changes. Depending on the assumption about what the second decimal point was, the inflation rate could be anywhere between 1.4% and 1.6%. Since Statistics Canada has a strict policy of not publishing the second decimal point for the CPI, one simply cannot tell if the inflation rate was 1.4%, 1.5% or 1.6% by speculating on what the second decimal place might have been. To avoid this uncertainty, Statistics Canada only calculates the inflation rate using one decimal point, which unambiguously yields the published 1.5%.

The inflation rate will never be revised

Nor is there any possibility that Statistics Canada will change its determination of inflation for 2016 at any point in the future. Statistics Canada publicly acknowledges that there can be no ambiguity in its calculation of the inflation rate. Many contracts as well as the whole tax and transfer system of governments are indexed to changes in the CPI. This requires a specific, unambiguous answer to the question of what the annual rate of inflation is as well as any year-over-year increase in the CPI.

The need for clarity in contracts is also why the CPI is unique in the statistical system in having a stated policy of never revising the data. It is the stated policy of Statistics Canada that because "The Consumer Price Index (CPI) is widely used and trusted by Canadians" that "The index is never revised, which means it can be used to settle contracts without concern that those contracts may have to be reopened at a later time."¹²

Statistics Canada does acknowledge that the data in the CPI are not perfect, and that there is some uncertainty surrounding both the concepts and measurement of prices, as it acknowledges exists for all its data. However, Statistics Canada also understands that the published CPI and calculated inflation rate can have no ambiguity because it is used to index literally the whole tax and transfer system of government as well as many contracts. This is why the CPI is unique among Statistics Canada products in openly having a policy that neither the CPI or the published inflation rate will ever be revised.

¹² The Canadian Consumer Price Index Reference Paper. Statistics Canada Catalogue No 62-553-X, Section 9.1, page 51.

APPENDIX**PHILIP CROSS****EXPERIENCE****Researcher, various institutions**

2013-present

I am Senior Fellow at the C.D. Howe and the Macdonald-Laurier Institutes and an Executive Fellow at University of Calgary School of Public Policy. I have written many papers for these institutes along with others such as the Fraser Institute. Most of the work involves macroeconomics, labour markets, pensions and the role of natural resources in the economy (a more extensive list is available on my website). I produce the monthly leading indicator for Bloomberg News. I have also done contract and consultation work with various government and business organizations, including the Auditor General of Canada. I am an active member of the C.D. Howe Institute's Business Cycle Dating Committee that establishes recession dates for Canada.

Research Coordinator, Macdonald-Laurier Institute

2012-2013

Responsible for coordinating the research undertaken by the Institute, from formulating project proposals to implementing them or coordinating with authors outside the institute who write the bulk of the reports. The subject matter is wide-ranging, including economic, social and political issues. Also took a leading role in articulating the views and policies advocated by the Institute, in interviews with the media, writing opeds, and giving speeches and presentations at conferences.

Chief Economic Analyst, Statistics Canada

2008-2012

While continuing to write the Canadian Economic Observer and the leading indicator, assumed organization-wide responsibility for quality and coherency of all major economic statistics. Does this by attending all briefings of senior management of upcoming releases of major economic data points in The Daily, ensuring both data quality and its presentation in a non-partisan tone;

Advises on the planning and coordinating of research and analysis activities in economic statistics, especially those relevant to public policy;

Identifies emerging challenges to the statistical system for senior management based on a detailed knowledge of the economy and extensive experience in how this impacts data.

Manager, Current Analysis Group, Statistics Canada

1991-2008

Wrote the Current Economic Conditions section of the Canadian Economic Observer, which states Statistics Canada's monthly view of the macroeconomy including the CPI, and articulates this view to media in many interviews. Also wrote several feature articles in the CEO on topics ranging from business cycles to the import content of exports to current analysis;

Played a leading role in ensuring the coherency and quality of data and research in Statistics Canada by reviewing all the major economic data releases before they were published and recommending changes and improvements to senior management;

Managed the research and analysis of up to 4 economists in the unit and another 4 support staff that produced the CEO.

Head of Current Analysis, Statistics Canada, 1984-1991

Responsible for articulating Statistics Canada's official assessment of current economic developments, including trends in the CPI, in various formats that led to the creation in 1988 of the Canadian Economic Observer, the successor to the Canadian Statistical Review as the flagship publication for economic statistics.

Various positions at Statistics Canada, 1976-1984

Worked in various positions in the National Accounts, specializing in the analysis of GDP and writing its quarterly press release. Initiated Statistics Canada's development of a chronology of recessions in Canada.

Education

I received a BA (Honours) in Economics from Queen's University in 1976. I have appeared as a guest lecturer for courses on economics at McGill University in 2009 and 2010 at the invitation of Professor William Watson and on business cycles in 2011 at the invitation of Christopher Ragan, on management at the Royal Military College at the invitation of Christian Leuprecht in 2013, and on business administration at the invitation of Professor Ian Lee several times in 2014 and 2015.

A selection of papers written for these various institutions includes:

Philip Cross and Munir Sheikh. Caught in the Middle: Some in Canada's Middle Class Are Doing Well, Others Have Reason to Worry. The University of Calgary School of Public Policy, March 2015. An assessment of the state of Canada's middle class, written with the former Chief Statistician of Canada.

Philip Cross. Revisions to Economic Statistics and Their Impact On Policymaking. CD Howe Institute, October 2017. A review of the uncertainty surrounding various statistics on Canada's economy and the implications for policymaking.

Philip Cross and Ian Lee. The Parliamentary Budget Officer: The First Five Years. In *How Ottawa Spends, 2014-2015*. Ed by G. Bruce Doern and Christopher Stoney. McGill-Queen's University Press, 2014. A review co-written with Ian Lee, a Professor at Carleton University's Sprott School of Business.

Philip Cross and Philippe Bergevin. Turning Points: Business Cycles in Canada Since 1926. CD Howe Institute Commentary No 366, October 2012. Documented the timing and reasons for recessions in Canada.

Philip Cross and Ziad Ghanem. Over a barrel? Canada and the rising cost of energy. *Canadian Economic Observer*, August 2008. A review of the impact of the rising cost of crude oil on the Canadian economy, notably consumers.

Philip Cross. Food Prices: A boon for producers, a buffer for consumers. *Canadian Economic Observer*, June 2008. An analysis of how rising food prices were affecting Canadian producers and consumers.

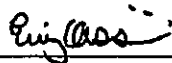
Philip Cross and Ziad Ghanem. Rising Energy Prices: How big a shock to consumers and industry? *Canadian Economic Observer*, November 2005. A look at how the post Hurricane Katrina surge in oil prices affected households and businesses, notably the role of government taxes in consumer energy prices.

Philip Cross and Diana Wyman. Different measures of economic activity: Physical quantity, current dollars, and volume. *Canadian Economic Observer*, November 2010. A detailed technical analysis of how Statcan uses prices to deflate current dollar measures of GDP in calculating real GDP.

Philip Cross. Recent trends in output and employment. *Canadian Economic Observer*, March 2007. Following criticism of Statistics Canada's estimates of GDP from outside analysts, including the Governor of the Bank of Canada, this paper examined why output and employment were rising in tandem, implying no productivity growth.

Philip Cross. Year-end Review of the Canadian Economy. *Canadian Economic Observer*, 1990 to 2011. These articles provided comprehensive assessments of the various sectors of the economy, including consumer prices.

This is Exhibit "B" referred to in the
Affidavit of Philip Cross
sworn before me, this 20th day of July, 2018.

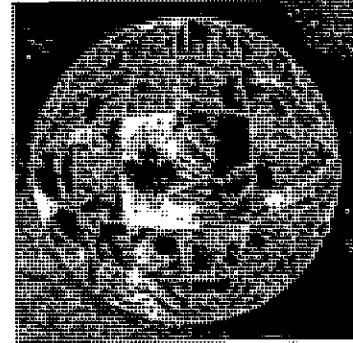


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The Consumer Price Index

October 2016



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- National telecommunications device for the hearing impaired 1-800-363-7629
- Fax line 1-877-287-4369

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- Inquiries line 1-800-635-7943
- Fax line 1-800-565-7757

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Statistics Canada
Consumer Prices Division

The Consumer Price Index

October 2016

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Note of appreciation

Canada owes the success of its statistical system to a long-standing partnership between Statistics Canada, the citizens of Canada, its businesses, governments and other institutions. Accurate and timely statistical information could not be produced without their continued cooperation and goodwill.

User information

Symbols

The following standard symbols are used in Statistics Canada publications:

- . not available for any reference period
- .. not available for a specific reference period
- ... not applicable
- 0 true zero or a value rounded to zero
- 0^s value rounded to 0 (zero) where there is a meaningful distinction between true zero and the value that was rounded
- P preliminary
- r revised
- x suppressed to meet the confidentiality requirements of the *Statistics Act*
- E use with caution
- F too unreliable to be published
- * significantly different from reference category ($p < 0.05$)

Note on CANSIM

Data that appears in the *The Consumer Price Index* (catalogue no. 62-001-X) are also available electronically, free of charge under the *Statistics Canada Open Licence Agreement*, in our CANSIM (Canadian Socio-Economic Information Management System) database through the Internet, under tables 326-0009, 326-0012, 326-0015, 326-0020, 326-0021, 326-0022 and 326-0031. In general, *CANSIM* provides a longer historical series. For further information on *CANSIM* call 1-800-263-1136.

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Note to users

The Consumer Price Index is published monthly and is not subject to revisions.

Index for the month	Release date
December 2015	January 22, 2016
January 2016	February 19, 2016
February 2016	March 18, 2016
March 2016	April 22, 2016
April 2016	May 20, 2016
May 2016	June 17, 2016
June 2016	July 22, 2016
July 2016	August 19, 2016
August 2016	September 23, 2016
September 2016	October 21, 2016
October 2016	November 18, 2016
November 2016	December 22, 2016
December 2016	January 20, 2017

Please note that the analytical text and charts previously found in this publication continue to be available in *The Daily*.

Data on inter-city indexes of price differentials of consumer goods and services, appearing in Table 15, have been updated to October 2015.

At the request of the Bank of Canada, Statistics Canada will produce and publish the Bank's three preferred measures of core inflation: CPI-trim (trimmed mean), CPI-median (weighted median), and CPI-common (common component). As of the Consumer Price Index (CPI) release on December 22, 2016, the following changes in the publication will be implemented:

1. The row titled "Bank of Canada's core index" will be deleted from Table 1 and Table 2.
2. The row titled "All-items excluding eight of the most volatile components (Bank of Canada definition)" will be deleted from Table 2.
3. The subsection titled "Bank of Canada's core index" will be omitted from the Data quality, concepts and methodology section.
4. Table 6 will be replaced with a new table on recent data for the Bank of Canada's preferred measures of core inflation.

The existing measure of core inflation will continue to be produced and published by Statistics Canada, but will no longer be referred to as the Bank of Canada's core index (CPIX). Instead, it will be titled "Consumer Price Index (CPI), all-items excluding eight of the most volatile components as defined by the Bank of Canada and excluding the effect of changes in indirect taxes". The current vectors associated with this measure will be available in their current CANSIM tables (326-0020 and 326-0022) until March 2017. After that, these vectors will be moved and published in a new CANSIM table (326-0023) containing the Bank of Canada's preferred measures of core inflation.

Methodology documents have been created to help data users understand the calculation of these preferred measures of core inflation:

- *Bank of Canada's Preferred Measures of Core Inflation – General Information Document*
- *Consumer Price Index: The Bank of Canada's Preferred Measures of Core Inflation – Methodology Document*

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Highlights

Main contributors to the 12-month change in the CPI:

Main upward contributors:

- Purchase of passenger vehicles (+4.4%)
- Homeowners' replacement cost (+4.1%)
- Electricity (+5.3%)
- Food purchased from restaurants (+2.6%)
- Property taxes and other special charges (+2.8%)

Main downward contributors:

- Travel tours (-8.7%)
- Fresh fruit (-7.4%)
- Meat (-1.7%)
- Fresh vegetables (-3.6%)
- Dairy products (-2.4%)

Main contributors to the monthly change in the CPI, not seasonally adjusted:

Main upward contributors:

- Gasoline (+3.7%)
- Property taxes and other special charges (+2.8%)
- Purchase of passenger vehicles (+0.6%)
- Passenger vehicle insurance premiums (+1.0%)
- Women's clothing (+1.0%)

Main downward contributors:

- Traveller accommodation (-11.4%)
- Travel tours (-2.7%)
- Fresh vegetables (-1.9%)
- Fresh fruit (-2.0%)
- Air transportation (-1.4%)

Analysis

Please note that the analytical text and charts previously found in this section continue to be available in *The Daily*.

Related products

Selected publications from Statistics Canada

62-010-X	Consumer Prices and Price Indexes
62-557-X	Your Guide to the Consumer Price Index
62F0014M	Analytical Series - Prices Division
62-553-X	The Canadian Consumer Price Index Reference Paper

Selected technical and analytical products from Statistics Canada

62F0014M1996001	How Inflation and Income Tax Affect the Return on a Safe Investment
62F0014M2001014	Televisions: Quality Changes and Scanner Data
62F0014M2001015	Housing Depreciation in the Canadian CPI

Selected CANSIM tables from Statistics Canada

326-0009	Average retail prices for gasoline and fuel oil, by urban centre, monthly
326-0012	Average retail prices for food and other selected items, monthly
326-0015	Inter-city indexes of price differentials of consumer goods and services, annual
326-0020	Consumer Price Index, monthly
326-0021	Consumer Price Index, annual
326-0022	Consumer Price Index, seasonally adjusted, monthly
326-0031	Basket Weights of the Consumer Price Index, occasional

Selected surveys from Statistics Canada

2301	Consumer Price Index
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Selected summary tables from Statistics Canada

- *Consumer Price Index, by province (monthly)*
- *Consumer Price Index, by city (monthly)*
- *Consumer Price Index, food, by province (monthly)*
- *Consumer Price Index, shelter, by province (monthly)*
- *Consumer Price Index, household operations, furnishings and equipment by province (monthly)*
- *Consumer Price Index, clothing and footwear, by province (monthly)*
- *Consumer Price Index, transportation, by province (monthly)*
- *Consumer Price Index, health and personal care, by province (monthly)*
- *Consumer Price Index, recreation, education and reading, by province (monthly)*
- *Consumer Price Index, alcoholic beverages and tobacco products, by province (monthly)*
- *Canada: Economic and financial data*
- *Consumer Price Index, by province*
- *Consumer Price Index, historical summary, by province or territory*
- *Gasoline and fuel oil, average retail prices by urban centre (monthly)*
- *Food and other selected items, average retail prices (monthly)*
- *Gasoline and fuel oil, average retail prices by urban centre*
- *Food and other selected items, average retail prices*
- *Consumer Price Index, food, by province*
- *Consumer Price Index, shelter, by province*
- *Consumer Price Index, household operations, furnishings and equipment, by province*
- *Consumer Price Index, clothing and footwear, by province*
- *Consumer Price Index, transportation, by province*
- *Consumer Price Index, health and personal care, by province*
- *Consumer Price Index, recreation, education and reading, by province*
- *Consumer Price Index, alcoholic beverages and tobacco products, by province*
- *Inter-city indexes of consumer price levels*

- *Consumer Price Index, by city*
- *Consumer Price Index, historical summary*
- *Economic indicators, by province and territory (monthly and quarterly)*

For further reading

Detailed information on the methodology and concepts of the CPI is contained in *The Canadian Consumer Price Index Reference Paper* (Occasional), catalogue no. 62-553-X.

A brief non-technical document entitled *Your Guide to the Consumer Price Index* (Occasional) catalogue no. 62-557-X answers the frequently asked questions about the construction and use of the CPI.

For further information, contact the Consumer Prices Division, Statistics Canada, Ottawa, Ontario K1A 0T6 (613-951-9606), or you can also search through the Statistics Canada catalogue which lists all current products and services available from Statistics Canada.

Statistical tables

The Consumer Price Index – October 2016

Table 1
The Consumer Price Index, major components and special aggregates, ¹ Canada, not seasonally adjusted

	CANSIM vector number	Relative importance ²	Indexes			Percentage change	
			October 2015	September 2016	October 2016	September 2016 to October 2016	October 2015 to October 2016
			2002=100			%	
All-items	(v41690973)	100.00	127.2	128.8	129.1	0.2	1.5
Food	(v41690974)	16.41	140.9	140.4	139.9	-0.4	-0.7
Shelter	(v41691050)	26.80	134.3	136.2	136.9	0.5	1.9
Household operations, furnishings and equipment	(v41691067)	13.14	120.6	121.9	122.1	0.2	1.2
Clothing and footwear	(v41691108)	6.08	97.7	96.8	97.5	0.7	-0.2
Transportation	(v41691128)	19.10	125.8	128.3	129.6	1.0	3.0
Health and personal care	(v41691153)	4.73	120.7	122.4	122.8	0.3	1.7
Recreation, education and reading	(v41691170)	10.89	110.8	113.8	112.4	-1.2	1.4
Alcoholic beverages and tobacco products	(v41691206)	2.86	152.9	157.7	158.1	0.3	3.4
All-items (1992=100)	(v41713403)	.	151.4	153.3	153.7	0.3	1.5
Special aggregates							
Goods	(v41691222)	46.68	117.1	117.8	118.3	0.4	1.0
Durable goods	(v41691223)	12.65	87.0	89.4	89.6	0.2	3.0
Semi-durable goods	(v41691224)	7.55	98.7	98.3	98.9	0.6	0.2
Non-durable goods	(v41691225)	26.48	139.2	139.1	139.7	0.4	0.4
Services	(v41691230)	53.32	137.4	139.9	139.9	0.0	1.8
All-items excluding food	(v41691232)	83.59	124.6	126.5	127.0	0.4	1.9
All-items excluding food and energy	(v41691233)	75.80	122.2	124.3	124.5	0.2	1.9
All-items excluding energy	(v41691238)	92.21	125.5	127.2	127.3	0.1	1.4
All-items excluding gasoline	(v41693245)	96.16	126.2	127.9	128.0	0.1	1.4
All-items excluding shelter, insurance and financial services	(v41693246)	69.31	122.8	124.3	124.4	0.1	1.3
Energy	(v41691239)	7.79	146.6	147.3	150.2	2.0	2.5
All-items excluding alcoholic beverages, tobacco products and smokers' supplies	(v41691241)	97.14	126.3	127.8	128.1	0.2	1.4
Bank of Canada's core index ³	(v41693242)	85.39	127.0	128.9	129.1	0.2	1.7

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" and "User information - Note to users" sections.

Table 2
The Consumer Price Index, major components and special aggregates, ¹ Canada, seasonally adjusted²

	CANSIM vector number	Indexes			Percentage change	
		August 2016	September 2016	October 2016	August 2016 to September 2016	September 2016 to October 2016
		2002=100			%	
All-items	(v41690914)	128.5	128.7	129.0	0.2	0.2
Food	(v41690915)	142.4	141.7	141.5	-0.5	-0.1
Shelter	(v41690916)	136.2	136.2	136.9	0.0	0.5
Household operations, furnishings and equipment	(v41690917)	122.1	121.9	122.0	-0.2	0.1
Clothing and footwear	(v41690918)	94.5	94.7	94.5	0.2	-0.2
Transportation	(v41690919)	127.9	128.5	129.9	0.5	1.1
Health and personal care	(v41690920)	122.7	122.5	122.9	-0.2	0.3
Recreation, education and reading	(v41690921)	111.2	111.6	111.6	0.4	0.0
Alcoholic beverages and tobacco products	(v41690922)	157.3	157.7	158.1	0.3	0.3
Special aggregates						
All-items excluding food	(v41690923)	125.7	126.1	126.5	0.3	0.3
All-items excluding food and energy	(v41690924)	123.9	124.0	124.1	0.1	0.1
All-items excluding eight of the most volatile components (Bank of Canada definition)	(v41690925)	127.9	128.0	128.1	0.1	0.1
Bank of Canada's core index ³	(v41690926)	128.6	128.7	128.7	0.1	0.0

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" and "User information - Note to users" sections.

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Table 3
The Consumer Price Index, provinces, Whitehorse, Yellowknife and Iqaluit, ¹ not seasonally adjusted

	CANSIM vector number	Indexes			Percentage change	
		October 2015	September 2016	October 2016	September 2016 to October 2016	October 2015 to October 2016
		2002=100			%	
Newfoundland and Labrador	(v41691244)	129.7	134.5	134.9	0.3	4.0
Prince Edward Island	(v41691379)	129.4	130.6	131.9	1.0	1.9
Nova Scotia	(v41691513)	129.8	131.6	131.6	0.0	1.4
New Brunswick	(v41691648)	125.9	129.4	129.4	0.0	2.8
Quebec	(v41691783)	125.2	125.8	125.9	0.1	0.6
Ontario	(v41691919)	127.9	130.1	130.6	0.4	2.1
Manitoba	(v41692055)	128.0	129.0	129.4	0.3	1.1
Saskatchewan	(v41692191)	131.7	132.4	132.7	0.2	0.8
Alberta	(v41692327)	135.1	135.3	135.8	0.4	0.5
British Columbia	(v41692462)	120.6	123.2	123.1	-0.1	2.1
Whitehorse, Yukon	(v41692598)	124.5	125.9	126.1	0.2	1.3
Yellowknife, Northwest Territories	(v41692722)	131.6	131.8	132.7	0.7	0.8
Iqaluit, Nunavut (200212=100)	(v41713432)	121.1	124.5	123.8	-0.6	2.2

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

The Consumer Price Index – October 2016

Table 4-1
The Consumer Price Index, major components and selected sub-groups, Canada, not seasonally adjusted — Food

	CANSIM vector number	Indexes			Percentage change	
		October 2015	September 2016	October 2016	September 2016 to October 2016	October 2015 to October 2016
		2002=100			%	
Food	(v41690974)	140.9	140.4	139.9	-0.4	-0.7
Food purchased from stores	(v41690975)	141.3	139.3	138.4	-0.6	-2.1
Meat	(v41690976)	159.0	156.7	156.3	-0.3	-1.7
Fresh or frozen meat (excluding poultry)	(v41690977)	174.2	166.2	165.2	-0.6	-5.2
Fresh or frozen beef	(v41690978)	188.1	177.2	178.0	0.5	-5.4
Fresh or frozen pork	(v41690979)	146.7	141.8	138.8	-2.1	-5.4
Fresh or frozen poultry	(v41690981)	151.8	153.5	151.3	-1.4	-0.3
Fresh or frozen chicken	(v41690982)	159.4	157.7	159.0	0.8	-0.3
Processed meat	(v41690984)	145.2	146.1	147.5	1.0	1.6
Ham and bacon	(v41690985)	142.9	143.7	134.2	-6.6	-6.1
Other processed meat	(v41690986)	150.8	151.7	155.1	2.2	2.9
Fish, seafood and other marine products	(v41690987)	126.2	132.0	129.4	-2.0	2.5
Fish	(v41690988)	131.5	138.6	137.6	-0.7	4.6
Fresh or frozen fish (including portions and fish sticks)	(v41690989)	129.6	137.9	136.7	-0.9	5.5
Canned and other preserved fish	(v41690990)	135.9	136.8	137.0	0.1	0.8
Dairy products and eggs	(v41690992)	137.3	134.6	133.7	-0.7	-2.6
Dairy products	(v41690993)	135.7	132.6	132.5	-0.1	-2.4
Fresh milk	(v41690994)	137.5	139.0	139.2	0.1	1.2
Butter	(v41690995)	133.1	137.8	131.8	-4.4	-1.0
Cheese	(v41690996)	134.7	127.6	129.3	1.3	-4.0
Ice cream and related products	(v41690997)	131.0	123.5	125.3	1.5	-4.4
Eggs	(v41690999)	156.2	158.2	147.5	-6.8	-5.6
Bakery and cereal products (excluding baby food)	(v41691000)	155.1	151.5	151.9	0.3	-2.1
Bakery products	(v41691001)	163.9	162.6	162.2	-0.2	-1.0
Bread, rolls and buns	(v41691002)	191.6	184.2	181.5	-1.5	-5.3
Cookies and crackers	(v41691003)	137.2	139.4	142.0	1.9	3.5
Other bakery products	(v41691004)	142.5	146.2	146.3	0.1	2.7
Cereal products (excluding baby food)	(v41691005)	139.5	132.4	134.0	1.2	-3.9
Rice and rice-based mixes	(v41691006)	140.7	143.5	141.2	-1.6	0.4
Breakfast cereal and other cereal products (excluding baby food)	(v41691007)	126.6	119.3	122.1	2.3	-3.6
Pasta products	(v41691008)	166.2	152.0	152.4	0.3	-8.3
Flour and flour-based mixes	(v41691009)	148.1	146.6	143.3	-2.3	-3.2
Fruit, fruit preparations and nuts	(v41691010)	133.9	129.7	127.0	-2.1	-5.2
Fresh fruit	(v41691011)	131.8	124.6	122.1	-2.0	-7.4
Apples	(v41691012)	141.1	152.2	136.9	-10.1	-3.0
Oranges	(v41691013)	135.9	130.1	131.2	0.8	-3.5
Bananas	(v41691014)	142.6	134.5	135.4	0.7	-5.0
Other fresh fruit	(v41691015)	124.9	114.3	112.9	-1.2	-9.6
Preserved fruit and fruit preparations	(v41691016)	129.7	130.8	126.3	-3.4	-2.6
Fruit juices	(v41691017)	132.3	132.8	126.1	-5.0	-4.7
Other preserved fruit and fruit preparations	(v41691018)	123.3	125.4	124.2	-1.0	0.7
Nuts	(v41691019)	150.7	154.7	154.9	0.1	2.8
Vegetables and vegetable preparations	(v41691020)	124.0	122.9	120.8	-1.7	-2.6
Fresh vegetables	(v41691021)	120.6	118.5	116.3	-1.9	-3.6
Potatoes	(v41691022)	97.8	106.7	98.4	-7.8	0.6
Tomatoes	(v41691023)	99.1	92.7	99.2	7.0	0.1
Lettuce	(v41691024)	131.0	100.7	104.8	4.1	-20.0
Other fresh vegetables	(v41691025)	133.5	133.8	129.9	-2.9	-2.7
Preserved vegetables and vegetable preparations	(v41691026)	137.6	140.5	138.5	-1.4	0.7
Frozen and dried vegetables	(v41691027)	141.5	141.9	139.4	-1.8	-1.5
Canned vegetables and other vegetable preparations	(v41691028)	137.1	141.0	139.2	-1.3	1.5
Other food products and non-alcoholic beverages	(v41691029)	134.3	133.3	133.2	-0.1	-0.8
Sugar and confectionery	(v41691030)	138.1	140.8	142.4	1.1	3.1
Edible fats and oils	(v41691033)	148.3	146.1	144.6	-1.0	-2.5
Coffee and tea	(v41691036)	137.4	133.0	133.6	0.5	-2.8
Condiments, spices and vinegars	(v41691039)	127.0	120.8	121.2	0.3	-4.6
Other food preparations	(v41691040)	139.8	138.8	138.6	-0.1	-0.9
Non-alcoholic beverages	(v41691045)	122.4	124.1	122.4	-1.4	0.0
Food purchased from restaurants	(v41691046)	139.8	143.1	143.5	0.3	2.6
Food purchased from table-service restaurants	(v41691047)	141.3	144.8	145.1	0.2	2.7
Food purchased from fast food and take-out restaurants	(v41691048)	136.5	139.3	140.0	0.5	2.6

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

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Table 4-2
The Consumer Price Index, major components and selected sub-groups, Canada, not seasonally adjusted — Shelter

	CANSIM vector number	Indexes			Percentage change	
		October 2015	September 2016	October 2016	September 2016 to October 2016	October 2015 to October 2016
		2002=100			%	
Shelter	(v41691050)	134.3	136.2	136.9	0.5	1.9
Rented accommodation	(v41691051)	118.8	119.4	119.5	0.1	0.6
Rent	(v41691052)	118.8	119.3	119.4	0.1	0.5
Owned accommodation	(v41691055)	136.3	138.4	139.4	0.7	2.3
Mortgage interest cost ¹	(v41691056)	103.6	102.9	102.8	-0.1	-0.8
Homeowners' replacement cost	(v41691057)	154.7	160.7	161.0	0.2	4.1
Property taxes and other special charges	(v41691058)	152.7	152.7	156.9	2.8	2.8
Homeowners' home and mortgage insurance	(v41691059)	214.9	220.2	220.8	0.3	2.7
Homeowners' maintenance and repairs	(v41691060)	133.2	135.4	137.0	1.2	2.9
Water, fuel and electricity	(v41691062)	151.9	155.8	156.2	0.3	2.8
Electricity	(v41691063)	144.2	152.1	151.8	-0.2	5.3
Water	(v41691064)	222.4	232.8	232.8	0.0	4.7
Natural gas	(v41691065)	111.6	107.1	107.8	0.7	-3.4
Fuel oil and other fuels	(v41691066)	190.0	174.7	183.6	5.1	-3.4

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

Table 4-3
The Consumer Price Index, major components and selected sub-groups, Canada, not seasonally adjusted — Household operations, furnishings and equipment

	CANSIM vector number	Indexes			Percentage change	
		October 2015	September 2016	October 2016	September 2016 to October 2016	October 2015 to October 2016
		2002=100			%	
Household operations, furnishings and equipment	(v41691067)	120.6	121.9	122.1	0.2	1.2
Household operations	(v41691068)	134.5	135.2	135.7	0.4	0.9
Communications	(v41691069)	128.1	126.9	127.4	0.4	-0.5
Telephone services	(v41691070)	124.6	123.1	124.1	0.8	-0.4
Postal and other communications services	(v41691071)	195.4	195.6	195.6	0.0	0.1
Internet access services (2002=100)	(v41693216)	125.1	125.5	124.2	-1.0	-0.7
Child care and housekeeping services	(v41691072)	152.7	155.8	156.7	0.6	2.6
Child care services	(v41691073)	151.8	154.9	155.5	0.4	2.4
Housekeeping services	(v41691074)	155.1	158.3	159.7	0.9	3.0
Household cleaning products	(v41691075)	113.0	110.9	111.4	0.5	-1.4
Paper, plastic and aluminum foil supplies	(v41691078)	124.6	122.7	125.3	2.1	0.6
Other household goods and services	(v41691081)	142.5	145.3	145.6	0.2	2.2
Pet food and supplies	(v41691082)	136.2	138.4	139.6	0.9	2.5
Seeds, plants and cut flowers	(v41691083)	120.7	122.7	123.1	0.3	2.0
Other horticultural goods	(v41691084)	109.2	109.3	109.8	0.5	0.5
Financial services (2002=100)	(v41693229)	142.8	144.5	144.5	0.0	1.2
Household furnishings and equipment	(v41691087)	96.9	99.2	98.8	-0.4	2.0
Furniture and household textiles	(v41691088)	96.0	98.5	98.2	-0.3	2.3
Furniture	(v41691089)	93.0	94.9	94.7	-0.2	1.8
Household textiles	(v41691093)	107.3	111.9	111.2	-0.6	3.6
Household equipment	(v41691097)	87.7	89.3	88.8	-0.6	1.3
Household appliances	(v41691098)	89.3	88.6	88.7	0.1	-0.7
Non-electric kitchen utensils, tableware and cookware	(v41691103)	80.0	81.4	79.0	-2.9	-1.3
Services related to household furnishings and equipment	(v41691107)	175.9	184.6	184.6	0.0	4.9

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

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Table 4-4

The Consumer Price Index, major components and selected sub-groups, Canada, not seasonally adjusted — Clothing and footwear

	CANSIM vector number	Indexes			Percentage change	
		October 2015	September 2016	October 2016	September 2016 to October 2016	October 2015 to October 2016
		2002=100			%	
Clothing and footwear	(v41691108)	97.7	96.8	97.5	0.7	-0.2
Clothing	(v41691109)	87.8	86.8	87.4	0.7	-0.5
Women's clothing	(v41691110)	83.7	83.3	84.1	1.0	0.5
Men's clothing	(v41691111)	96.2	95.4	96.2	0.8	0.0
Children's clothing	(v41691112)	81.7	77.6	76.8	-1.0	-6.0
Footwear	(v41691113)	96.7	95.2	95.8	0.6	-0.9
Clothing accessories, watches and jewellery	(v41691118)	138.1	139.0	140.7	1.2	1.9
Clothing material, notions and services	(v41691123)	142.4	144.5	144.5	0.0	1.5

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

Table 4-5

The Consumer Price Index, major components and selected sub-groups, Canada, not seasonally adjusted — Transportation

	CANSIM vector number	Indexes			Percentage change	
		October 2015	September 2016	October 2016	September 2016 to October 2016	October 2015 to October 2016
		2002=100			%	
Transportation	(v41691128)	125.8	128.3	129.6	1.0	3.0
Private transportation	(v41691129)	124.7	126.8	128.4	1.3	3.0
Purchase, leasing and rental of passenger vehicles	(v41691130)	95.0	98.6	99.2	0.6	4.4
Purchase and leasing of passenger vehicles	(v41691131)	94.8	98.3	98.9	0.6	4.3
Purchase of passenger vehicles	(v41691132)	95.6	99.2	99.8	0.6	4.4
Rental of passenger vehicles	(v41691134)	104.2	115.4	115.4	0.0	10.7
Operation of passenger vehicles	(v41691135)	151.5	151.8	154.5	1.8	2.0
Gasoline	(v41691136)	149.0	147.3	152.7	3.7	2.5
Passenger vehicle parts, maintenance and repairs	(v41691137)	136.5	138.6	139.0	0.3	1.8
Other passenger vehicle operating expenses	(v41691140)	162.3	163.6	164.8	0.7	1.5
Passenger vehicle insurance premiums	(v41691141)	164.8	165.1	166.7	1.0	1.2
Passenger vehicle registration fees	(v41691142)	127.2	132.0	132.0	0.0	3.8
Drivers' licences	(v41691143)	162.5	165.5	165.5	0.0	1.8
Parking fees	(v41691144)	177.0	183.3	183.3	0.0	3.6
Public transportation	(v41691146)	136.2	141.5	140.3	-0.8	3.0
Local and commuter transportation	(v41691147)	152.8	154.5	154.5	0.0	1.1
City bus and subway transportation	(v41691148)	154.8	158.0	158.0	0.0	2.1
Taxi and other local and commuter transportation services	(v41691149)	146.1	144.0	144.0	0.0	-1.4
Inter-city transportation	(v41691150)	127.4	134.2	132.6	-1.2	4.1
Air transportation	(v41691151)	124.9	132.0	130.2	-1.4	4.2
Rail, highway bus and other inter-city transportation	(v41691152)	135.4	137.3	138.2	0.7	2.1

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Table 4-6
The Consumer Price Index, major components and selected sub-groups, Canada, not seasonally adjusted — Health and personal care

	CANSIM vector number	Indexes			Percentage change	
		October 2015	September 2016	October 2016	September 2016 to October 2016	October 2015 to October 2016
		2002=100			%	
Health and personal care	(v41691153)	120.7	122.4	122.8	0.3	1.7
Health care	(v41691154)	123.2	125.5	125.3	-0.2	1.7
Health care goods	(v41713463)	102.8	104.2	103.7	-0.5	0.9
Medicinal and pharmaceutical products	(v41691156)	99.2	100.5	99.9	-0.6	0.7
Prescribed medicines	(v41691157)	89.3	89.2	89.4	0.2	0.1
Non-prescribed medicines	(v41691158)	117.1	121.4	119.2	-1.8	1.8
Eye care goods	(v41713381)	112.0	113.4	113.7	0.3	1.5
Health care services	(v41713464)	155.7	159.8	159.8	0.0	2.6
Eye care services (200704=100)	(v41693244)	120.9	123.3	123.3	0.0	2.0
Dental care services	(v41691161)	152.2	155.6	155.6	0.0	2.2
Personal care	(v41691163)	118.4	119.3	120.4	0.9	1.7
Personal care supplies and equipment	(v41691164)	105.9	105.7	107.4	1.6	1.4
Personal care services	(v41691169)	137.3	140.2	140.3	0.1	2.2

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

Table 4-7
The Consumer Price Index, major components and selected sub-groups, Canada, not seasonally adjusted — Recreation, education and reading

	CANSIM vector number	Indexes			Percentage change	
		October 2015	September 2016	October 2016	September 2016 to October 2016	October 2015 to October 2016
		2002=100			%	
Recreation, education and reading	(v41691170)	110.8	113.8	112.4	-1.2	1.4
Recreation	(v41691171)	98.0	100.6	98.8	-1.8	0.8
Recreational equipment and services (excluding recreational vehicles)	(v41691172)	54.2	54.3	54.8	0.9	1.1
Purchase and operation of recreational vehicles	(v41691179)	124.0	126.2	127.5	1.0	2.8
Home entertainment equipment, parts and services	(v41691184)	55.3	54.0	54.1	0.2	-2.2
Travel services	(v41691190)	98.0	104.0	95.7	-8.0	-2.3
Traveller accommodation ¹	(v41691191)	91.9	106.8	94.6	-11.4	2.9
Travel tours	(v41691192)	100.2	94.0	91.5	-2.7	-8.7
Other cultural and recreational services	(v41691193)	156.6	160.7	161.1	0.2	2.9
Spectator entertainment (excluding video and audio subscription services)	(v41691194)	140.3	141.1	143.9	2.0	2.6
Video and audio subscription services	(v41691195)	173.2	180.5	180.5	0.0	4.2
Use of recreational facilities and services	(v41691196)	145.9	147.5	147.0	-0.3	0.8
Education and reading	(v41691197)	154.2	158.7	158.9	0.1	3.0
Education	(v41691198)	159.4	163.3	163.5	0.1	2.6
Tuition fees	(v41691199)	166.8	171.4	171.4	0.0	2.8
Reading material (excluding textbooks)	(v41691202)	135.9	145.4	145.7	0.2	7.2
Newspapers	(v41691203)	164.0	169.0	171.1	1.2	4.3
Magazines and periodicals	(v41691204)	136.8	139.1	140.1	0.7	2.4

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

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Table 4-8

The Consumer Price Index, major components and selected sub-groups, Canada, not seasonally adjusted — Alcoholic beverages and tobacco products

	CANSIM vector number	Indexes			Percentage change	
		October 2015	September 2016	October 2016	September 2016 to October 2016	October 2015 to October 2016
		2002=100			%	
Alcoholic beverages and tobacco products	(v41691206)	152.9	157.7	158.1	0.3	3.4
Alcoholic beverages	(v41691207)	123.1	125.2	125.3	0.1	1.8
Alcoholic beverages served in licensed establishments	(v41691208)	135.7	138.0	138.0	0.0	1.7
Beer served in licensed establishments	(v41691209)	141.3	143.7	143.7	0.0	1.7
Liquor served in licensed establishments	(v41691211)	135.6	137.5	137.5	0.0	1.4
Alcoholic beverages purchased from stores	(v41691212)	117.5	119.4	119.6	0.2	1.8
Beer purchased from stores	(v41691213)	124.5	126.3	126.2	-0.1	1.4
Wine purchased from stores	(v41691214)	106.6	108.7	109.2	0.5	2.4
Liquor purchased from stores	(v41691215)	116.6	118.3	118.6	0.3	1.7
Tobacco products and smokers' supplies	(v41691216)	188.6	198.3	199.1	0.4	5.6
Cigarettes	(v41691217)	188.4	198.2	198.9	0.4	5.6

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

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Table 5
The Consumer Price Index for Canada, All-items CPI, not seasonally adjusted, historical data

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual average ¹
	2002=100												
Indexes (v41690973)													
1997	89.9	90.1	90.2	90.2	90.3	90.5	90.5	90.6	90.6	90.6	90.5	90.4	90.4
1998	90.9	91.0	91.1	91.0	91.3	91.4	91.4	91.4	91.2	91.6	91.6	91.3	91.3
1999	91.5	91.6	92.0	92.5	92.7	92.9	93.1	93.3	93.6	93.7	93.6	93.7	92.9
2000	93.5	94.1	94.8	94.5	94.9	95.5	95.8	95.7	96.1	96.3	96.6	96.7	95.4
2001	96.3	96.8	97.1	97.8	98.6	98.7	98.4	98.4	98.6	98.1	97.2	97.4	97.8
2002	97.6	96.2	98.9	99.5	99.7	99.9	100.5	100.9	100.9	101.2	101.5	101.1	100.0
2003	102.0	102.8	103.1	102.4	102.5	102.5	102.6	102.9	103.1	102.8	103.1	103.2	102.8
2004	103.3	103.5	103.9	104.1	105.0	105.1	105.0	104.8	105.0	105.2	105.6	105.4	104.7
2005	105.3	105.7	106.3	106.6	106.7	106.9	107.1	107.5	108.4	107.9	107.7	107.6	107.0
2006	108.2	108.0	108.6	109.2	109.7	109.5	109.6	109.8	109.2	109.0	109.2	109.4	109.1
2007	109.4	110.2	111.1	111.6	112.1	111.9	112.0	111.7	111.9	111.6	111.9	112.0	111.5
2008	111.8	112.2	112.6	113.5	114.6	115.4	115.8	115.6	115.7	114.5	114.1	113.3	114.1
2009	113.0	113.8	114.0	113.9	114.7	115.1	114.7	114.7	114.7	114.6	115.2	114.8	114.4
2010	115.1	115.6	115.6	116.0	116.3	116.2	116.8	116.7	116.9	117.4	117.5	117.5	116.5
2011	117.8	118.1	119.4	119.8	120.6	119.8	120.0	120.3	120.6	120.8	120.9	120.2	119.9
2012	120.7	121.2	121.7	122.2	122.1	121.6	121.5	121.8	122.0	122.2	121.9	121.2	121.7
2013	121.3	122.7	122.9	122.7	123.0	123.0	123.1	123.1	123.3	123.0	123.0	122.7	122.8
2014	123.1	124.1	124.8	125.2	125.8	125.9	125.7	125.7	125.8	125.9	125.4	124.5	125.2
2015	124.3	125.4	126.3	126.2	126.9	127.2	127.3	127.3	127.1	127.2	127.1	126.5	126.6
2016	126.8	127.1	127.9	128.3	128.8	129.1	128.9	128.7	128.8	129.1	..	..	..
Percentage change from the corresponding month of the previous year (v41690973)													
1997	2.2	2.3	1.9	1.7	1.5	1.7	1.7	1.8	1.7	1.5	0.9	0.8	1.7
1998	1.1	1.0	1.0	0.9	1.1	1.0	1.0	0.9	0.7	1.1	1.2	1.0	1.0
1999	0.7	0.7	1.0	1.6	1.5	1.6	1.9	2.1	2.6	2.3	2.2	2.6	1.8
2000	2.2	2.7	3.0	2.2	2.4	2.8	2.9	2.6	2.7	2.8	3.2	3.2	2.7
2001	3.0	2.9	2.4	3.5	3.9	3.4	2.7	2.8	2.6	1.9	0.6	0.7	2.5
2002	1.3	1.4	1.9	1.7	1.1	1.2	2.1	2.5	2.3	3.2	4.4	3.8	2.2
2003	4.5	4.7	4.2	2.9	2.8	2.6	2.1	2.0	2.2	1.6	1.6	2.1	2.8
2004	1.3	0.7	0.8	1.7	2.4	2.5	2.3	1.8	1.8	2.3	2.4	2.1	1.8
2005	1.9	2.1	2.3	2.4	1.6	1.7	2.0	2.6	3.2	2.6	2.0	2.1	2.2
2006	2.8	2.2	2.2	2.4	2.8	2.4	2.3	2.1	0.7	1.0	1.4	1.7	2.0
2007	1.1	2.0	2.3	2.2	2.2	2.2	2.2	1.7	2.5	2.4	2.5	2.4	2.2
2008	2.2	1.8	1.4	1.7	2.2	3.1	3.4	3.5	3.4	2.6	2.0	1.2	2.3
2009	1.1	1.4	1.2	0.4	0.1	-0.3	-0.9	-0.8	-0.9	0.1	1.0	1.3	0.3
2010	1.9	1.6	1.4	1.8	1.4	1.0	1.8	1.7	1.9	2.4	2.0	2.4	1.8
2011	2.3	2.2	3.3	3.3	3.7	3.1	2.7	3.1	3.2	2.9	2.9	2.3	2.9
2012	2.5	2.6	1.9	2.0	1.2	1.5	1.3	1.2	1.2	1.2	0.8	0.8	1.5
2013	0.5	1.2	1.0	0.4	0.7	1.2	1.3	1.1	1.1	0.7	0.9	1.2	0.9
2014	1.5	1.1	1.5	2.0	2.3	2.4	2.1	2.1	2.0	2.4	2.0	1.5	2.0
2015	1.0	1.0	1.2	0.8	0.9	1.0	1.3	1.3	1.0	1.0	1.4	1.6	1.1
2016	2.0	1.4	1.3	1.7	1.5	1.5	1.3	1.1	1.3	1.5	..	..	..

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

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Table 6
The Bank of Canada's core index, ¹ not seasonally adjusted, historical data

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual average ²
2002=100													
Indexes (v41693242)													
1997	91.3	91.5	91.7	91.9	92.0	92.1	92.1	92.3	92.4	92.5	92.4	92.3	92.0
1998	92.6	92.9	93.0	93.0	93.2	93.2	93.3	93.4	93.4	93.7	93.7	93.5	93.2
1999	93.5	93.8	94.1	94.2	94.5	94.6	94.7	94.9	95.2	95.1	95.0	94.8	94.5
2000	94.6	95.0	95.3	95.3	95.5	95.8	95.8	96.0	96.2	96.3	96.4	96.4	95.7
2001	96.3	96.6	97.1	97.4	97.7	97.9	98.2	98.3	98.4	98.4	98.1	98.0	97.7
2002	98.1	98.8	99.2	99.6	99.8	100.0	100.2	100.7	100.9	100.9	101.2	100.7	100.0
2003	101.3	101.8	102.0	101.7	102.2	102.1	102.1	102.2	102.6	102.7	103.0	102.8	102.2
2004	102.8	103.0	103.3	103.5	103.7	103.8	104.0	103.8	104.1	104.1	104.7	104.6	103.8
2005	104.5	104.8	105.2	105.2	105.4	105.4	105.4	105.6	105.9	105.9	106.3	106.2	105.5
2006	106.2	106.6	107.0	106.9	107.5	107.2	107.5	107.7	108.3	108.4	108.6	108.4	107.5
2007	108.6	109.1	109.5	109.6	109.9	109.9	110.0	110.1	110.5	110.3	110.3	110.0	109.8
2008	110.1	110.7	110.9	111.2	111.5	111.6	111.7	112.0	112.4	112.2	113.0	112.6	111.7
2009	112.2	112.8	113.1	113.2	113.7	113.7	113.7	113.8	114.1	114.2	114.7	114.3	113.6
2010	114.4	115.2	115.0	115.3	115.7	115.6	115.5	115.6	115.8	116.3	116.3	116.0	115.6
2011	116.0	116.2	117.0	117.2	117.8	117.1	117.3	117.8	118.4	118.7	118.8	118.2	117.5
2012	118.4	118.9	119.2	119.7	119.9	119.4	119.3	119.7	119.9	120.2	120.2	119.5	119.5
2013	119.6	120.6	120.9	121.0	121.2	121.0	121.0	121.2	121.4	121.6	121.5	121.0	121.0
2014	121.3	122.1	122.5	122.7	123.3	123.2	123.1	123.7	124.0	124.4	124.1	123.7	123.2
2015	124.0	124.7	125.4	125.5	126.0	126.0	126.0	126.3	126.6	127.0	126.6	126.1	125.9
2016	126.5	127.1	128.0	128.2	128.6	128.6	128.6	128.6	128.9	129.1	..	..	..
Percentage change from the corresponding month of the previous year (v41693242)													
1997	2.1	1.9	2.1	2.2	2.1	2.2	2.0	2.0	1.8	1.9	1.2	1.3	1.9
1998	1.4	1.5	1.4	1.2	1.3	1.2	1.3	1.2	1.1	1.3	1.4	1.3	1.3
1999	1.0	1.0	1.2	1.3	1.4	1.5	1.5	1.6	1.9	1.5	1.4	1.4	1.4
2000	1.2	1.3	1.3	1.2	1.1	1.3	1.2	1.2	1.1	1.3	1.5	1.7	1.3
2001	1.8	1.7	1.9	2.2	2.3	2.2	2.5	2.4	2.3	2.2	1.8	1.7	2.1
2002	1.9	2.3	2.2	2.3	2.1	2.1	2.0	2.4	2.5	2.5	3.2	2.8	2.4
2003	3.3	3.0	2.8	2.1	2.4	2.1	1.9	1.5	1.7	1.8	1.8	2.1	2.2
2004	1.5	1.2	1.3	1.8	1.5	1.7	1.9	1.6	1.5	1.4	1.7	1.8	1.6
2005	1.7	1.7	1.8	1.6	1.6	1.5	1.3	1.7	1.7	1.7	1.5	1.5	1.6
2006	1.6	1.7	1.7	1.6	2.0	1.7	2.0	2.0	2.3	2.4	2.2	2.1	1.9
2007	2.3	2.3	2.3	2.5	2.2	2.5	2.3	2.2	2.0	1.8	1.6	1.5	2.1
2008	1.4	1.5	1.3	1.5	1.5	1.5	1.5	1.7	1.7	1.7	2.4	2.4	1.7
2009	1.9	1.9	2.0	1.8	2.0	1.9	1.8	1.6	1.5	1.8	1.5	1.5	1.7
2010	2.0	2.1	1.7	1.9	1.8	1.7	1.6	1.6	1.5	1.8	1.4	1.5	1.8
2011	1.4	0.9	1.7	1.6	1.8	1.3	1.6	1.9	2.2	2.1	2.1	1.9	1.6
2012	2.1	2.3	1.9	2.1	1.8	2.0	1.7	1.6	1.3	1.3	1.2	1.1	1.7
2013	1.0	1.4	1.4	1.1	1.1	1.3	1.4	1.3	1.3	1.2	1.1	1.3	1.3
2014	1.4	1.2	1.3	1.4	1.7	1.8	1.7	2.1	2.1	2.3	2.1	2.2	1.8
2015	2.2	2.1	2.4	2.3	2.2	2.3	2.4	2.1	2.1	2.1	2.0	1.9	2.2
2016	2.0	1.9	2.1	2.2	2.1	2.1	2.1	1.8	1.8	1.7	..	..	..

Note(s): See "Data quality, concepts and methodology -- Explanatory notes for tables" and "User information - Note to users" sections.

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Table 7
The Consumer Price Index for Canada, major components and special aggregates, not seasonally adjusted, historical data

	Major components							Special aggregates				
	Food	Shelter	Household operations, furnishings and equipment	Clothing and footwear	Transportation	Health and personal care	Recreation, education and reading	Alcoholic beverages and tobacco products	Goods ¹	Services ²	All-items excluding food and energy ³	Energy ³
CANSIM vector number	(v41690974)	(v41691050)	(v41691067)	(v41691108)	(v41691128)	(v41691153)	(v41691170)	(v41691206)	(v41691222)	(v41691230)	(v41691233)	(v41691239)
2002=100												
Annual averages⁴												
1997	89.4	90.8	93.7	97.7	90.3	91.7	91.0	72.3	91.2	89.5	91.5	83.9
1998	90.9	91.1	95.1	98.8	89.6	93.6	93.0	74.9	91.4	91.1	92.7	80.5
1999	92.0	92.3	95.8	100.1	92.6	95.4	94.7	76.5	93.1	92.6	94.0	85.0
2000	93.3	95.6	96.7	100.3	97.2	97.0	97.0	79.0	96.0	94.8	95.5	98.8
2001	97.4	99.1	98.6	100.7	97.3	98.9	98.4	85.0	98.4	97.1	97.3	102.0
2002	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2003	101.7	103.2	100.7	98.2	105.2	101.4	100.8	110.1	101.9	103.6	102.5	107.9
2004	103.6	105.8	101.2	98.0	107.7	102.8	101.1	116.0	103.4	105.9	103.9	115.2
2005	106.4	109.2	101.7	97.6	112.0	104.6	100.8	119.1	105.8	108.2	105.3	126.3
2006	108.9	113.1	102.2	95.8	115.2	105.9	100.8	121.7	107.1	111.1	106.9	132.8
2007	111.8	116.9	103.2	95.7	117.1	107.3	101.8	125.5	108.0	114.8	109.0	135.9
2008	115.7	122.0	104.6	93.8	119.5	108.8	102.2	127.5	109.4	118.7	110.3	149.3
2009	121.4	121.6	107.3	93.4	113.1	112.1	103.1	130.7	107.6	121.2	111.5	128.2
2010	123.1	123.3	108.8	91.6	118.0	115.1	104.0	133.1	109.2	123.7	112.9	137.8
2011	127.7	125.6	110.9	91.9	125.6	117.1	105.3	135.6	112.9	126.7	114.7	154.7
2012	130.8	127.1	113.0	92.0	128.1	118.7	105.9	137.6	114.0	129.3	116.2	157.3
2013	132.4	128.7	114.4	92.1	129.0	118.3	108.2	140.4	114.6	131.0	117.2	159.6
2014	135.5	132.2	116.6	93.2	130.4	119.0	107.4	146.6	116.5	133.7	119.0	185.3
2015	140.5	133.7	119.7	94.6	126.5	120.5	109.4	152.0	116.8	136.4	121.2	149.5
Monthly indexes												
2015												
January	139.1	133.1	118.0	91.1	122.4	120.0	105.6	149.9	114.0	134.7	119.5	139.5
February	139.5	133.1	118.9	93.3	124.3	120.1	107.9	150.3	115.3	135.5	120.3	145.1
March	138.5	133.3	119.4	96.4	126.6	119.5	106.7	150.7	117.0	135.6	121.0	149.8
April	139.4	133.1	119.7	96.2	126.6	120.1	107.7	151.4	116.7	135.6	121.0	148.1
May	140.8	133.2	119.7	95.0	128.0	120.7	109.9	151.9	117.6	136.2	121.3	152.4
June	141.0	133.5	120.0	93.0	129.6	120.5	110.6	152.1	118.0	136.5	121.3	157.5
July	140.9	133.8	120.1	93.0	129.2	120.6	111.2	152.2	117.9	136.8	121.3	159.2
August	140.8	133.9	120.4	94.0	127.8	120.5	111.7	152.6	117.5	137.1	121.5	156.1
September	140.3	133.9	120.5	96.7	125.4	120.7	112.3	152.9	116.8	137.4	121.9	149.3
October	140.9	134.3	120.6	97.7	125.8	120.7	110.8	152.9	117.1	137.4	122.2	146.6
November	141.6	134.4	119.8	96.7	126.3	121.6	108.8	153.8	117.3	136.9	121.9	146.5
December	142.5	134.5	119.6	91.7	125.6	121.0	107.9	153.5	116.3	136.8	121.3	143.4
2016												
January	144.6	134.6	120.0	90.8	125.1	121.5	107.9	154.5	116.6	137.0	121.6	139.0
February	145.0	134.7	121.0	92.1	123.7	121.5	109.6	155.2	116.5	137.7	122.3	134.6
March	144.5	134.8	121.4	96.0	125.3	121.4	110.9	156.2	117.8	138.0	123.1	138.1
April	143.8	134.9	121.6	96.0	127.8	122.2	110.3	156.5	118.6	138.0	123.3	143.4
May	143.3	135.1	122.1	96.0	129.4	122.3	111.7	156.8	118.9	138.8	123.8	146.9
June	142.8	135.6	122.4	94.1	131.0	122.2	112.0	156.7	119.1	139.1	123.9	150.6
July	143.2	136.0	122.3	92.6	128.9	122.0	113.3	157.1	118.2	139.7	123.6	147.4
August	142.3	136.2	122.2	93.6	128.2	122.7	112.9	157.3	117.9	139.6	123.8	147.0
September	140.4	136.2	121.9	96.8	128.3	122.4	113.8	157.7	117.8	139.9	124.3	147.3
October	139.9	136.9	122.1	97.5	129.6	122.8	112.4	158.1	118.3	139.9	124.5	150.2

Note(s): For information on the continuity of the series, see "Data quality, concepts and methodology — Data quality, concepts and methodology — Weights and Linking" at the end of this publication.

See "Data quality, concepts and methodology — Explanatory notes for tables" section.

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Table 8-1
Annual average¹ percentage changes for the Consumer Price Index — Major components, not seasonally adjusted
Canada

	CANSIM vector number	Annual average	Annual average percentage change			
		2015	2012	2013	2014	2015
		2002=100	%			
All-items	(v41693271)	126.6	1.5	0.9	2.0	1.1
Food	(v41693272)	140.5	2.4	1.2	2.3	3.7
Shelter	(v41693348)	133.7	1.2	1.3	2.7	1.1
Household operations, furnishings and equipment	(v41693365)	119.7	1.9	1.2	1.9	2.7
Clothing and footwear	(v41693406)	94.6	0.1	0.1	1.2	1.5
Transportation	(v41693426)	126.5	2.0	0.7	1.1	-3.0
Health and personal care	(v41693451)	120.5	1.4	-0.3	0.6	1.3
Recreation, education and reading	(v41693468)	109.4	0.6	0.3	1.1	1.9
Alcoholic beverages and tobacco products	(v41693504)	152.0	1.5	2.0	4.4	3.7
Goods	(v41693520)	116.8	1.0	0.5	1.7	0.3
Durable goods	(v41693521)	86.8	-0.6	-0.2	0.2	1.5
Semi-durable goods	(v41693522)	96.0	0.0	0.1	1.1	1.5
Non-durable goods	(v41693523)	139.8	1.8	0.9	2.5	-0.7
Services	(v41693528)	136.4	2.1	1.3	2.1	2.0
All-items excluding food	(v41693530)	123.9	1.4	0.8	1.8	0.6
All-items excluding food and energy	(v41693531)	121.2	1.3	0.9	1.5	1.8
All-items excluding energy	(v41693536)	124.6	1.5	0.9	1.8	2.1
Energy	(v41693537)	149.5	1.7	1.5	3.6	-9.6

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

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Table 8-2
Annual average¹ percentage changes for the Consumer Price Index — All-items, not seasonally adjusted, Canada, provinces, cities

	CANSIM vector number	Annual average	Annual average percentage change			
		2015	2012	2013	2014	2015
		2002=100	%			
Canada	(v41693271)	126.6	1.5	0.9	2.0	1.1
Newfoundland and Labrador	(v41693542)	129.0	2.1	1.7	1.9	0.5
Prince Edward Island	(v41693677)	129.3	2.0	2.0	1.6	-0.6
Nova Scotia	(v41693811)	129.3	2.0	1.2	1.7	0.4
New Brunswick	(v41693946)	125.4	1.7	0.8	1.5	0.5
Quebec	(v41694081)	124.7	2.1	0.7	1.4	1.1
Ontario	(v41694217)	127.4	1.4	1.0	2.4	1.2
Manitoba	(v41694353)	126.8	1.6	2.2	1.9	1.2
Saskatchewan	(v41694489)	130.8	1.6	1.5	2.4	1.6
Alberta	(v41694625)	133.7	1.1	1.4	2.6	1.1
British Columbia	(v41694760)	120.2	1.1	-0.1	1.0	1.1
Whitehorse, Yukon	(v41694896)	124.1	2.3	1.7	1.3	-0.2
Yellowknife, Northwest Territories	(v41695020)	130.4	2.2	1.5	1.7	1.6
Iqaluit, Nunavut (2002=100) ²	(v41713462)	120.4	1.7	1.1	1.3	1.9
St. John's, Newfoundland and Labrador	(v41695144)	128.7	2.1	1.6	1.9	0.4
Charlottetown and Summerside, Prince Edward Island	(v41695150)	128.8	1.9	2.0	1.7	-0.4
Halifax, Nova Scotia	(v41695156)	128.2	1.7	1.1	1.8	0.5
Saint John, New Brunswick	(v41695162)	125.3	1.6	0.7	1.5	0.5
Québec, Quebec	(v41695168)	124.7	2.2	0.9	1.3	1.0
Montréal, Quebec	(v41695174)	124.9	2.0	0.8	1.5	1.4
Ottawa-Gatineau, Ontario part, Ontario/Quebec	(v41695180)	126.5	1.3	1.0	2.0	1.0
Toronto, Ontario	(v41695186)	128.3	1.5	1.2	2.5	1.5
Thunder Bay, Ontario	(v41695192)	122.3	0.9	0.9	2.2	1.1
Winnipeg, Manitoba	(v41695198)	126.6	1.5	2.3	1.9	1.4
Regina, Saskatchewan	(v41695204)	131.5	1.8	1.7	2.4	1.4
Saskatoon, Saskatchewan	(v41695210)	131.0	1.5	1.0	2.3	1.9
Edmonton, Alberta	(v41695216)	133.4	1.1	1.3	2.2	1.2
Calgary, Alberta	(v41695222)	134.3	1.0	1.7	3.0	1.2
Vancouver, British Columbia	(v41695228)	121.9	1.3	0.2	1.1	1.2
Victoria, British Columbia	(v41695234)	118.6	1.0	-0.3	0.9	1.1

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

The Consumer Price Index – October 2016

Table 9-1

The Consumer Price Index, major components, selected sub-groups and special aggregates, provinces, Whitehorse and Yellowknife, not seasonally adjusted — Newfoundland and Labrador

	CANSIM vector number	Indexes			Percentage change	
		October 2015	September 2016	October 2016	September 2016 to October 2016	October 2015 to October 2016
		2002=100			%	
All-items	(v41691244)	129.7	134.5	134.9	0.3	4.0
Special aggregates						
All-items excluding food	(v41691368)	127.0	132.1	132.8	0.5	4.6
All-items excluding food and energy	(v41691369)	122.7	126.8	127.3	0.4	3.7
All-items excluding energy	(v41691374)	126.7	130.7	130.8	0.1	3.2
All-items excluding gasoline	(v41693247)	129.6	133.1	133.3	0.2	2.9
Energy ¹	(v41691375)	149.2	162.3	164.6	1.4	10.3
All-items (1992=100)	(v41713404)	152.1	157.7	158.2	0.3	4.0
Food	(v41691245)	143.4	146.5	144.9	-1.1	1.0
Food purchased from stores	(v41691246)	142.6	144.8	142.7	-1.5	0.1
Meat	(v41691247)	157.7	157.2	153.1	-2.6	-2.9
Dairy products	(v41691257)	133.4	131.3	128.6	-2.1	-3.6
Bakery and cereal products (excluding baby food)	(v41691262)	176.0	176.6	176.2	-0.2	0.1
Fresh fruit	(v41691266)	129.9	132.9	137.2	3.2	5.6
Fresh vegetables	(v41691269)	100.4	109.3	103.4	-5.4	3.0
Food purchased from restaurants	(v41691276)	147.3	154.3	154.3	0.0	4.8
Shelter	(v41691277)	151.4	152.7	154.6	1.2	2.1
Rented accommodation	(v41691278)	126.7	127.4	127.7	0.2	0.8
Owned accommodation	(v41691280)	148.9	153.8	156.4	1.7	5.0
Homeowners' replacement cost	(v41691281)	185.6	187.9	188.6	0.4	1.6
Homeowners' home and mortgage insurance	(v41691283)	162.3	191.7	191.7	0.0	18.1
Homeowners' maintenance and repairs	(v41691284)	164.2	173.2	173.5	0.2	5.7
Water, fuel and electricity	(v41691285)	167.2	159.8	161.3	0.9	-3.5
Electricity	(v41691286)	154.6	146.5	146.5	0.0	-5.2
Natural gas						
Fuel oil and other fuels	(v41691288)	176.7	172.3	180.0	4.5	1.9
Household operations, furnishings and equipment	(v41691289)	117.6	124.1	125.2	0.9	6.5
Household operations	(v41691290)	133.7	140.7	142.8	1.5	6.8
Telephone services	(v41691292)	126.4	140.4	141.7	0.9	12.1
Internet access services (200212=100)	(v41693217)	128.0	128.2	140.0	9.2	9.4
Household furnishings and equipment	(v41691297)	92.2	97.9	97.5	-0.4	5.7
Clothing and footwear	(v41691304)	101.9	99.5	98.7	-0.8	-3.1
Women's clothing	(v41691306)	93.6	91.1	89.1	-2.2	-4.8
Men's clothing	(v41691307)	100.8	101.0	100.3	-0.7	-0.5
Footwear	(v41691309)	100.2	98.4	97.9	-0.5	-2.3
Transportation	(v41691312)	122.4	133.7	134.2	0.4	9.6
Private transportation	(v41691313)	121.5	133.4	134.1	0.5	10.4
Purchase and leasing of passenger vehicles	(v41691315)	96.9	102.0	102.3	0.3	5.6
Gasoline	(v41691318)	134.8	166.1	169.1	1.8	25.4
Passenger vehicle insurance premiums	(v41691321)	147.3	150.8	150.8	0.0	2.4
Public transportation	(v41691323)	131.4	137.6	136.3	-0.9	3.7
Health and personal care	(v41691328)	115.5	117.9	119.1	1.0	3.1
Health care	(v41691329)	112.8	115.2	114.9	-0.3	1.9
Personal care	(v41691335)	119.6	122.0	125.1	2.5	4.6
Recreation, education and reading	(v41691338)	106.8	109.4	109.3	-0.1	2.3
Recreation	(v41691339)	104.8	107.2	107.0	-0.2	2.1
Education and reading	(v41691347)	116.7	120.9	121.0	0.1	3.7
Alcoholic beverages and tobacco products	(v41691351)	159.7	170.2	169.7	-0.3	6.3
Alcoholic beverages	(v41691352)	128.1	135.0	134.6	-0.3	5.1
Tobacco products and smokers' supplies	(v41691358)	187.4	201.4	200.9	-0.2	7.2

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

The Consumer Price Index – October 2016

Table 9-2

The Consumer Price Index, major components, selected sub-groups and special aggregates, provinces, Whitehorse and Yellowknife, not seasonally adjusted — Prince Edward Island

	CANSIM vector number	Indexes			Percentage change	
		October 2015	September 2016	October 2016	September 2016 to October 2016	October 2015 to October 2016
		2002=100			%	
All-items	(v41691379)	129.4	130.6	131.9	1.0	1.9
Special aggregates						
All-items excluding food	(v41691502)	125.9	127.5	128.9	1.1	2.4
All-items excluding food and energy	(v41691503)	119.9	122.1	122.9	0.7	2.5
All-items excluding energy	(v41691508)	125.1	126.8	127.6	0.6	2.0
All-items excluding gasoline	(v41693249)	128.3	129.5	130.6	0.8	1.8
Energy ¹	(v41691509)	162.0	158.1	164.7	4.2	1.7
All-items (1992=100)	(v41713406)	152.3	153.7	155.2	1.0	1.9
Food	(v41691380)	147.5	146.5	147.3	0.5	-0.1
Food purchased from stores	(v41691381)	150.5	148.6	149.2	0.4	-0.9
Meat	(v41691382)	169.2	154.0	160.1	4.0	-5.4
Dairy products	(v41691392)	146.9	147.3	147.0	-0.2	0.1
Bakery and cereal products (excluding baby food)	(v41691397)	183.8	182.9	181.5	-0.8	-1.3
Fresh fruit	(v41691401)	114.0	120.0	115.8	-3.5	1.6
Fresh vegetables	(v41691404)	129.0	130.8	122.8	-6.1	-4.8
Food purchased from restaurants	(v41691411)	137.7	140.3	141.5	0.9	2.8
Shelter	(v41691412)	131.8	130.7	132.5	1.4	0.5
Rented accommodation	(v41691413)	116.4	116.5	116.9	0.3	0.4
Owned accommodation	(v41691415)	117.9	118.7	119.5	0.7	1.4
Homeowners' replacement cost	(v41691416)	120.1	121.2	122.4	1.0	1.9
Homeowners' home and mortgage insurance	(v41691418)	162.6	167.1	167.1	0.0	2.8
Homeowners' maintenance and repairs	(v41691419)	137.8	144.1	151.2	4.9	9.7
Water, fuel and electricity	(v41691420)	174.4	167.2	172.9	3.4	-0.9
Electricity	(v41691421)	153.6	157.3	158.7	0.9	3.3
Natural gas						
Fuel oil and other fuels	(v41691423)	184.3	162.0	173.7	7.2	-5.8
Household operations, furnishings and equipment	(v41691424)	124.8	129.1	130.4	1.0	4.5
Household operations	(v41691425)	136.9	141.0	143.1	1.5	4.5
Telephone services	(v41691427)	119.4	125.3	127.3	1.6	6.6
Internet access services (200212=100)	(v41693218)	133.6	135.7	139.9	3.1	4.7
Household furnishings and equipment	(v41691432)	99.2	104.3	103.6	-0.7	4.4
Clothing and footwear	(v41691439)	104.0	104.4	104.0	-0.4	0.0
Women's clothing	(v41691441)	92.1	96.3	97.4	1.1	5.8
Men's clothing	(v41691442)	99.4	98.4	94.9	-3.6	-4.5
Footwear	(v41691444)	115.3	114.0	115.1	1.0	-0.2
Transportation	(v41691447)	124.0	126.5	129.0	2.0	4.0
Private transportation	(v41691448)	123.4	125.7	128.5	2.2	4.1
Purchase and leasing of passenger vehicles	(v41691450)	93.4	96.7	98.0	1.3	4.9
Gasoline	(v41691453)	149.8	149.8	156.9	4.7	4.7
Passenger vehicle insurance premiums	(v41691456)	142.2	144.8	145.3	0.3	2.2
Public transportation	(v41691458)	135.1	140.5	139.9	-0.4	3.6
Health and personal care	(v41691462)	116.8	120.7	121.4	0.6	3.9
Health care	(v41691463)	112.5	115.7	115.9	0.2	3.0
Personal care	(v41691469)	123.0	127.9	129.8	1.5	5.5
Recreation, education and reading	(v41691472)	112.4	113.9	113.8	-0.1	1.2
Recreation	(v41691473)	100.8	101.1	101.0	-0.1	0.2
Education and reading	(v41691481)	146.9	153.2	153.1	-0.1	4.2
Alcoholic beverages and tobacco products	(v41691485)	186.9	188.2	190.6	1.3	2.0
Alcoholic beverages	(v41691486)	133.1	133.5	136.0	1.9	2.2
Tobacco products and smokers' supplies	(v41691492)	219.8	221.8	223.9	0.9	1.9

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

The Consumer Price Index – October 2016

Table 9-3

The Consumer Price Index, major components, selected sub-groups and special aggregates, provinces, Whitehorse and Yellowknife, not seasonally adjusted — Nova Scotia

	CANSIM vector number	Indexes			Percentage change	
		October 2015	September 2016	October 2016	September 2016 to October 2016	October 2015 to October 2016
		2002=100			%	
All-items	(v41691513)	129.8	131.6	131.6	0.0	1.4
Special aggregates						
All-items excluding food	(v41691637)	126.3	128.0	128.2	0.2	1.5
All-items excluding food and energy	(v41691638)	121.9	123.9	123.8	-0.1	1.6
All-items excluding energy	(v41691643)	126.8	128.7	128.5	-0.2	1.3
All-items excluding gasoline	(v41693251)	129.3	130.9	130.7	-0.2	1.1
Energy ¹	(v41691644)	150.4	150.2	152.1	1.3	1.1
All-items (1992=100)	(v41713408)	155.5	157.6	157.6	0.0	1.4
Food	(v41691514)	148.0	150.0	148.7	-0.9	0.5
Food purchased from stores	(v41691515)	148.3	149.8	147.8	-1.3	-0.3
Meat	(v41691516)	160.8	161.9	160.4	-0.9	-0.2
Dairy products	(v41691526)	132.8	135.4	135.1	-0.2	1.7
Bakery and cereal products (excluding baby food)	(v41691531)	178.1	173.9	175.2	0.7	-1.6
Fresh fruit	(v41691535)	122.1	119.9	118.3	-1.3	-3.1
Fresh vegetables	(v41691538)	120.8	131.9	113.5	-13.9	-6.0
Food purchased from restaurants	(v41691545)	147.4	151.0	151.7	0.5	2.9
Shelter	(v41691546)	139.8	139.3	139.6	0.2	-0.1
Rented accommodation	(v41691547)	114.4	115.3	115.3	0.0	0.8
Owned accommodation	(v41691549)	136.0	136.5	136.9	0.3	0.7
Homeowners' replacement cost	(v41691550)	146.2	146.7	146.5	-0.1	0.2
Homeowners' home and mortgage insurance	(v41691552)	245.9	253.1	253.1	0.0	2.9
Homeowners' maintenance and repairs	(v41691553)	136.6	137.2	139.3	1.5	2.0
Water, fuel and electricity	(v41691554)	169.2	164.7	164.6	-0.1	-2.7
Electricity	(v41691555)	153.1	151.7	151.7	0.0	-0.9
Natural gas						
Fuel oil and other fuels	(v41691557)	180.5	166.2	166.1	-0.1	-8.0
Household operations, furnishings and equipment	(v41691558)	121.2	122.7	123.0	0.2	1.5
Household operations	(v41691559)	136.8	139.2	139.0	-0.1	1.6
Telephone services	(v41691561)	122.3	125.5	126.5	0.8	3.4
Internet access services (200212=100)	(v41693219)	133.2	131.6	126.1	-4.2	-5.3
Household furnishings and equipment	(v41691566)	90.5	90.4	91.6	1.3	1.2
Clothing and footwear	(v41691573)	107.0	100.5	100.8	0.3	-5.8
Women's clothing	(v41691575)	102.2	100.8	100.6	-0.2	-1.6
Men's clothing	(v41691576)	97.4	95.7	95.6	-0.1	-1.8
Footwear	(v41691578)	110.1	89.2	90.7	1.7	-17.6
Transportation	(v41691581)	118.9	123.2	124.1	0.7	4.4
Private transportation	(v41691582)	117.9	122.0	123.2	1.0	4.5
Purchase and leasing of passenger vehicles	(v41691584)	95.9	99.7	100.3	0.6	4.6
Gasoline	(v41691587)	133.1	138.6	142.5	2.8	7.1
Passenger vehicle insurance premiums	(v41691590)	116.1	120.3	120.3	0.0	3.6
Public transportation	(v41691592)	131.7	137.3	136.0	-0.9	3.3
Health and personal care	(v41691597)	117.7	119.7	120.5	0.7	2.4
Health care	(v41691598)	115.4	117.9	117.6	-0.3	1.9
Personal care	(v41691604)	120.7	121.8	124.3	2.1	3.0
Recreation, education and reading	(v41691607)	112.5	118.0	116.2	-1.5	3.3
Recreation	(v41691608)	103.8	109.1	106.8	-2.1	2.9
Education and reading	(v41691616)	139.0	145.3	145.5	0.1	4.7
Alcoholic beverages and tobacco products	(v41691620)	181.7	189.3	189.3	0.0	4.2
Alcoholic beverages	(v41691621)	132.5	134.2	133.8	-0.3	1.0
Tobacco products and smokers' supplies	(v41691627)	221.9	235.8	236.2	0.2	6.4

Note(s): See "Date quality, concepts and methodology — Explanatory notes for tables" section.

The Consumer Price Index – October 2016

Table 9-4

The Consumer Price Index, major components, selected sub-groups and special aggregates, provinces, Whitehorse and Yellowknife, not seasonally adjusted — New Brunswick

	CANSIM vector number	Indexes			Percentage change	
		October 2015	September 2016	October 2016	September 2016 to October 2016	October 2015 to October 2016
		2002=100			%	
All-items	(v41691648)	125.9	129.4	129.4	0.0	2.8
Special aggregates						
All-items excluding food	(v41691772)	121.5	125.5	125.7	0.2	3.5
All-items excluding food and energy	(v41691773)	117.8	121.7	121.5	-0.2	3.1
All-items excluding energy	(v41691778)	123.5	126.9	126.5	-0.3	2.4
All-items excluding gasoline	(v41693253)	125.3	128.7	128.5	-0.2	2.6
Energy 1	(v41691779)	141.3	146.0	149.0	2.1	5.4
All-items (1992=100)	(v41713410)	149.3	153.5	153.5	0.0	2.8
Food	(v41691649)	148.6	149.2	148.0	-0.8	-0.4
Food purchased from stores	(v41691650)	151.2	150.2	148.4	-1.2	-1.9
Meat	(v41691651)	173.5	168.6	168.3	-0.2	-3.0
Dairy products	(v41691651)	132.2	133.7	134.1	0.3	1.4
Bakery and cereal products (excluding baby food)	(v41691656)	178.8	171.9	171.5	-0.2	-4.1
Fresh fruit	(v41691670)	126.7	123.1	123.6	0.4	-2.4
Fresh vegetables	(v41691673)	127.3	121.7	111.8	-8.1	-12.2
Food purchased from restaurants	(v41691680)	142.3	147.3	147.5	0.1	3.7
Shelter	(v41691681)	130.2	132.3	133.4	0.8	2.5
Rented accommodation	(v41691682)	113.7	114.7	114.8	0.1	1.0
Owned accommodation	(v41691684)	123.4	125.5	126.5	0.8	2.5
Homeowners' replacement cost	(v41691685)	120.8	123.1	124.9	1.5	3.4
Homeowners' home and mortgage insurance	(v41691687)	205.4	222.2	222.2	0.0	8.2
Homeowners' maintenance and repairs	(v41691688)	133.9	139.3	141.6	1.7	5.8
Water, fuel and electricity	(v41691689)	155.3	158.5	160.6	1.3	3.4
Electricity	(v41691690)	140.5	145.4	145.4	0.0	3.5
Natural gas						
Fuel oil and other fuels	(v41691692)	179.9	164.2	164.2	12.2	2.4
Household operations, furnishings and equipment	(v41691693)	121.4	125.2	125.5	0.2	3.4
Household operations	(v41691694)	137.6	141.9	143.5	1.1	4.3
Telephone services	(v41691696)	133.3	137.7	138.6	0.7	4.0
Internet access services (200212=100)	(v41693220)	122.1	126.9	138.0	8.7	13.0
Household furnishings and equipment	(v41691701)	92.0	94.8	93.2	-1.7	1.3
Clothing and footwear	(v41691708)	100.7	102.2	101.7	-0.5	1.0
Women's clothing	(v41691710)	87.4	86.6	87.9	-0.8	0.6
Men's clothing	(v41691711)	98.0	100.1	99.1	-1.0	1.1
Footwear	(v41691713)	98.2	101.5	101.0	-0.5	2.9
Transportation	(v41691716)	117.6	123.6	124.5	0.7	5.9
Private transportation	(v41691717)	117.1	123.1	124.0	0.7	5.9
Purchase and leasing of passenger vehicles	(v41691719)	93.2	98.3	98.4	0.1	5.6
Gasoline	(v41691722)	131.3	138.0	141.8	2.8	8.0
Passenger vehicle insurance premiums	(v41691725)	123.4	131.6	131.6	0.0	6.6
Public transportation	(v41691727)	131.0	137.2	136.2	-0.7	4.0
Health and personal care	(v41691732)	111.6	114.7	113.7	-0.9	1.9
Health care	(v41691733)	112.0	114.6	113.9	-0.6	1.7
Personal care	(v41691739)	112.0	115.9	114.4	-1.3	2.1
Recreation, education and reading	(v41691742)	111.8	115.4	113.9	-1.3	1.9
Recreation	(v41691743)	102.2	105.5	103.7	-1.7	1.5
Education and reading	(v41691751)	148.0	152.3	152.3	0.0	2.9
Alcoholic beverages and tobacco products	(v41691755)	168.4	183.8	182.5	-0.7	8.4
Alcoholic beverages	(v41691756)	133.3	136.4	133.8	-1.9	0.4
Tobacco products and smokers' supplies	(v41691762)	195.3	223.1	223.4	0.1	14.4

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

The Consumer Price Index – October 2016

Table 9-5

The Consumer Price Index, major components, selected sub-groups and special aggregates, provinces, Whitehorse and Yellowknife, not seasonally adjusted — Quebec

	CANSIM vector number	Indexes			Percentage change	
		October 2015	September 2016	October 2016	September 2016 to October 2016	October 2015 to October 2016
		2002=100			%	
All-items	(v41691783)	125.2	125.8	125.9	0.1	0.6
Special aggregates						
All-items excluding food	(v41691908)	121.4	122.2	122.5	0.2	0.9
All-items excluding food and energy	(v41691909)	118.7	119.7	119.7	0.0	0.8
All-items excluding energy	(v41691914)	123.4	124.1	124.0	-0.1	0.6
All-items excluding gasoline	(v41693255)	124.0	124.7	124.6	-0.1	0.5
Energy 1	(v41691915)	140.6	139.2	142.5	2.4	1.4
All-items (1992=100)	(v41713412)	144.6	145.3	145.4	0.1	0.6
Food	(v41691784)	142.1	141.6	140.8	-0.6	-0.9
Food purchased from stores	(v41691785)	141.3	139.4	138.2	-0.9	-2.2
Meat	(v41691786)	166.2	162.2	161.7	-0.3	-2.7
Dairy products	(v41691796)	133.6	130.8	129.9	-0.7	-2.8
Bakery and cereal products (excluding baby food)	(v41691801)	150.9	147.7	145.6	-1.4	-3.5
Fresh fruit	(v41691805)	131.4	127.7	123.5	-3.3	-6.0
Fresh vegetables	(v41691808)	115.3	110.8	114.2	3.1	-1.0
Food purchased from restaurants	(v41691815)	143.8	147.0	147.2	0.1	2.4
Shelter	(v41691816)	129.0	129.8	130.5	0.5	1.2
Rented accommodation	(v41691817)	116.8	117.7	117.8	0.1	0.9
Owned accommodation	(v41691819)	133.6	134.7	135.7	0.7	1.6
Homeowners' replacement cost	(v41691820)	151.5	152.9	153.5	0.4	1.3
Homeowners' home and mortgage insurance	(v41691822)	147.8	157.1	157.1	0.0	6.3
Homeowners' maintenance and repairs	(v41691823)	138.4	140.5	142.6	1.5	3.0
Water, fuel and electricity	(v41691824)	133.2	132.8	133.5	0.5	0.2
Electricity	(v41691825)	122.9	123.6	123.6	0.0	0.6
Natural gas	(v41691827)	109.0	106.2	107.2	0.9	-1.7
Fuel oil and other fuels	(v41691828)	184.2	168.4	179.3	6.5	-2.7
Household operations, furnishings and equipment	(v41691829)	122.5	122.4	121.6	-0.7	-0.7
Household operations	(v41691830)	135.5	134.3	133.7	-0.4	-1.3
Telephone services	(v41691832)	136.5	129.0	130.9	1.5	-4.1
Internet access services (200212=100)	(v41693221)	106.9	105.0	95.6	-9.0	-10.6
Household furnishings and equipment	(v41691837)	101.7	103.7	102.4	-1.3	0.7
Clothing and footwear	(v41691844)	95.7	94.8	95.0	0.2	-0.7
Women's clothing	(v41691846)	80.6	80.2	80.1	-0.1	-0.6
Men's clothing	(v41691847)	95.1	95.6	95.1	-0.5	0.0
Footwear	(v41691849)	99.7	96.2	98.4	2.3	-1.3
Transportation	(v41691852)	125.3	126.4	127.7	1.0	1.9
Private transportation	(v41691853)	124.0	124.8	126.3	1.2	1.9
Purchase and leasing of passenger vehicles	(v41691855)	95.3	98.8	99.3	0.5	4.2
Gasoline	(v41691858)	148.5	146.2	151.9	3.9	2.3
Passenger vehicle insurance premiums	(v41691861)	172.1	160.1	159.6	-0.3	-7.3
Public transportation	(v41691863)	143.3	147.9	147.0	-0.6	2.6
Health and personal care	(v41691868)	121.1	122.4	122.7	0.2	1.3
Health care	(v41691869)	122.0	123.7	123.6	-0.1	1.3
Personal care	(v41691875)	119.8	120.7	121.8	0.9	1.7
Recreation, education and reading	(v41691878)	100.6	102.1	101.3	-0.8	0.7
Recreation	(v41691879)	91.1	92.5	91.5	-1.1	0.4
Education and reading	(v41691887)	142.6	144.6	144.8	0.1	1.5
Alcoholic beverages and tobacco products	(v41691891)	147.7	149.5	150.2	0.5	1.7
Alcoholic beverages	(v41691892)	118.8	119.2	119.9	0.6	0.9
Tobacco products and smokers' supplies	(v41691898)	185.3	190.5	190.8	0.2	3.0

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

The Consumer Price Index – October 2016

Table 9-6

The Consumer Price Index, major components, selected sub-groups and special aggregates, provinces, Whitehorse and Yellowknife, not seasonally adjusted — Ontario

	CANSIM vector number	Indexes			Percentage change	
		October 2015	September 2016	October 2016	September 2016 to October 2016	October 2015 to October 2016
		2002=100			%	
All-items	(v41691919)	127.9	130.1	130.6	0.4	2.1
Special aggregates						
All-items excluding food	(v41692044)	125.6	128.3	128.7	0.3	2.5
All-items excluding food and energy	(v41692045)	123.7	126.1	126.4	0.2	2.2
All-items excluding energy	(v41692050)	126.6	128.5	128.8	0.2	1.7
All-items excluding gasoline	(v41693257)	127.2	129.5	129.7	0.2	2.0
Energy ¹	(v41692051)	149.4	155.4	157.8	1.5	5.6
All-items (1992=100)	(v41713415)	153.7	156.3	156.8	0.3	2.0
Food	(v41691920)	141.3	140.5	140.8	0.2	-0.4
Food purchased from stores	(v41691921)	142.9	140.7	141.0	0.2	-1.3
Meat	(v41691922)	158.2	157.7	158.0	0.2	-0.1
Dairy products	(v41691932)	135.5	131.4	133.4	1.5	-1.5
Bakery and cereal products (excluding baby food)	(v41691937)	161.0	155.9	158.0	1.3	-1.9
Fresh fruit	(v41691941)	128.7	118.5	116.4	-1.8	-9.6
Fresh vegetables	(v41691944)	119.5	116.3	117.7	1.2	-1.5
Food purchased from restaurants	(v41691951)	137.6	140.4	140.8	0.3	2.3
Shelter	(v41691952)	135.0	138.9	139.5	0.4	3.3
Rented accommodation	(v41691953)	116.5	117.6	117.7	0.1	1.0
Owned accommodation	(v41691955)	137.4	140.6	141.6	0.7	3.1
Homeowners' replacement cost	(v41691956)	165.3	175.8	176.1	0.2	6.5
Homeowners' home and mortgage insurance	(v41691958)	231.8	233.9	234.7	0.3	1.3
Homeowners' maintenance and repairs	(v41691959)	133.5	135.6	137.0	1.0	2.6
Water, fuel and electricity	(v41691960)	162.7	174.8	174.0	-0.5	6.9
Electricity	(v41691961)	167.9	193.5	193.5	0.0	15.2
Natural gas	(v41691963)	101.6	98.2	95.9	-2.3	-5.6
Fuel oil and other fuels	(v41691964)	200.4	182.7	190.3	4.2	-5.0
Household operations, furnishings and equipment	(v41691965)	122.3	123.7	124.1	0.3	1.5
Household operations	(v41691966)	137.7	138.7	139.3	0.4	1.2
Telephone services	(v41691968)	132.2	131.2	131.9	0.5	-0.2
Internet access services (2002=100)	(v41693222)	122.2	120.6	120.8	0.2	-1.1
Household furnishings and equipment	(v41691973)	95.4	97.6	97.5	-0.1	2.2
Clothing and footwear	(v41691980)	94.9	94.3	95.3	1.1	0.4
Women's clothing	(v41691982)	82.4	81.4	83.0	2.0	0.7
Men's clothing	(v41691983)	96.3	94.9	96.9	2.1	0.6
Footwear	(v41691985)	87.8	89.6	88.6	-1.1	0.9
Transportation	(v41691988)	125.6	128.3	129.9	1.2	3.4
Private transportation	(v41691989)	124.3	126.7	128.7	1.6	3.5
Purchase and leasing of passenger vehicles	(v41691991)	94.3	98.1	98.5	0.4	4.5
Gasoline	(v41691994)	145.7	145.7	151.6	4.0	4.0
Passenger vehicle insurance premiums	(v41691997)	170.9	168.5	172.3	2.3	0.8
Public transportation	(v41691999)	136.0	140.9	139.9	-0.7	2.9
Health and personal care	(v41692004)	122.1	123.9	124.0	0.1	1.6
Health care	(v41692005)	124.2	127.0	126.5	-0.4	1.9
Personal care	(v41692011)	120.3	121.1	121.9	0.7	1.3
Recreation, education and reading	(v41692014)	114.0	117.1	115.4	-1.5	1.2
Recreation	(v41692015)	98.2	100.5	98.2	-2.3	0.0
Education and reading	(v41692023)	158.3	163.7	163.9	0.1	3.5
Alcoholic beverages and tobacco products	(v41692027)	155.5	161.5	161.7	0.1	4.0
Alcoholic beverages	(v41692028)	121.2	123.1	122.9	-0.2	1.4
Tobacco products and smokers' supplies	(v41692034)	198.0	211.9	213.0	0.5	7.6

Note(s): See "Date quality, concepts and methodology — Explanatory notes for tables" section.

The Consumer Price Index – October 2016

Table 9-7

The Consumer Price Index, major components, selected sub-groups and special aggregates, provinces, Whitehorse and Yellowknife, not seasonally adjusted — Manitoba

	CANSIM vector number	Indexes			Percentage change	
		October 2015	September 2016	October 2016	September 2016 to October 2016	October 2015 to October 2016
		2002=100			%	
All-Items	(v41692055)	128.0	129.0	129.4	0.3	1.1
Special aggregates						
All-items excluding food	(v41692180)	125.3	126.9	127.5	0.5	1.8
All-items excluding food and energy	(v41692181)	123.3	125.5	125.9	0.3	2.1
All-items excluding energy	(v41692186)	126.6	128.2	128.4	0.2	1.4
All-items excluding gasoline	(v41693259)	126.7	128.3	128.4	0.1	1.3
Energy 1	(v41692187)	142.9	137.2	140.5	2.4	-1.7
All-items (1992=100)	(v41713419)	157.5	158.8	159.3	0.3	1.1
Food	(v41692056)	141.5	139.6	138.7	-0.6	-2.0
Food purchased from stores	(v41692057)	138.8	135.0	133.6	-1.0	-3.7
Meat	(v41692058)	148.3	150.2	148.0	-1.5	-0.2
Dairy products	(v41692068)	138.2	134.0	134.4	0.3	-2.7
Bakery and cereal products (excluding baby food)	(v41692073)	151.4	145.2	144.7	-0.3	-4.4
Fresh fruit	(v41692077)	128.5	123.3	122.5	-0.6	-4.7
Fresh vegetables	(v41692080)	125.2	123.4	115.4	-6.5	-8.6
Food purchased from restaurants	(v41692087)	146.6	149.5	150.0	0.3	2.3
Shelter	(v41692088)	139.3	141.6	142.4	0.6	2.2
Rented accommodation	(v41692089)	127.0	128.1	128.3	0.2	1.0
Owned accommodation	(v41692091)	145.7	147.5	148.7	0.8	2.1
Homeowners' replacement cost	(v41692092)	183.0	187.1	187.8	0.4	2.6
Homeowners' home and mortgage insurance	(v41692094)	174.0	178.7	178.7	0.0	2.7
Homeowners' maintenance and repairs	(v41692095)	139.6	140.8	140.8	0.0	0.9
Water, fuel and electricity	(v41692086)	132.0	137.4	137.6	0.1	4.2
Electricity	(v41692097)	140.8	145.5	145.5	0.0	3.3
Natural gas	(v41692099)	89.8	89.5	89.5	0.0	-0.3
Fuel oil and other fuels	(v41692100)	187.2	171.1	184.4	7.8	-1.5
Household operations, furnishings and equipment	(v41692101)	120.0	121.3	121.0	-0.2	0.8
Household operations	(v41692102)	130.3	131.2	131.0	-0.2	0.5
Telephone services	(v41692104)	117.2	120.1	118.8	-1.1	1.4
Internet access services (200212=100)	(v41693223)	148.7	159.7	158.9	-0.5	6.9
Household furnishings and equipment	(v41692109)	101.4	103.4	102.8	-0.6	1.4
Clothing and footwear	(v41692116)	97.5	96.4	95.8	-0.6	-1.7
Women's clothing	(v41692118)	86.9	85.2	84.3	-1.1	-3.0
Men's clothing	(v41692119)	90.9	90.2	89.5	-0.8	-1.5
Footwear	(v41692121)	95.1	94.7	94.8	0.1	-0.3
Transportation	(v41692124)	125.0	126.9	127.7	0.6	2.2
Private transportation	(v41692125)	124.6	126.1	127.1	0.8	2.0
Purchase and leasing of passenger vehicles	(v41692127)	99.1	103.2	103.1	-0.1	4.0
Gasoline	(v41692130)	159.3	145.1	151.5	4.4	-4.9
Passenger vehicle insurance premiums	(v41692133)	123.0	126.8	126.8	0.0	3.1
Public transportation	(v41692135)	130.4	136.2	134.9	-1.0	3.5
Health and personal care	(v41692140)	114.5	115.1	116.2	1.0	1.5
Health care	(v41692141)	116.0	118.4	118.1	-0.3	1.8
Personal care	(v41692147)	113.6	111.7	114.6	2.6	0.9
Recreation, education and reading	(v41692150)	110.1	111.8	113.4	1.4	3.0
Recreation	(v41692151)	103.0	104.1	106.1	1.9	3.0
Education and reading	(v41692159)	137.6	141.4	141.7	0.2	3.0
Alcoholic beverages and tobacco products	(v41692163)	173.3	175.8	175.6	-0.1	1.3
Alcoholic beverages	(v41692164)	143.0	145.9	144.2	-1.2	0.8
Tobacco products and smokers' supplies	(v41692170)	201.0	203.0	204.4	0.7	1.7

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

The Consumer Price Index – October 2016

Table 9-8

The Consumer Price Index, major components, selected sub-groups and special aggregates, provinces, Whitehorse and Yellowknife, not seasonally adjusted — Saskatchewan

	CANSIM vector number	Indexes			Percentage change	
		October 2015	September 2016	October 2016	September 2016 to October 2016	October 2015 to October 2016
		2002=100			%	
All-items	(v41692191)	131.7	132.4	132.7	0.2	0.8
Special aggregates						
All-items excluding food	(v41692316)	129.5	130.5	131.1	0.5	1.2
All-items excluding food and energy	(v41692317)	127.9	129.5	130.1	0.5	1.7
All-items excluding energy	(v41692322)	130.7	131.9	132.2	0.2	1.1
All-items excluding gasoline	(v41693261)	131.0	132.2	132.4	0.2	1.1
Energy ¹	(v41692323)	139.9	135.3	136.1	0.6	-2.7
All-items (1992=100)	(v41713421)	162.9	163.7	164.1	0.2	0.7
Food	(v41692192)	143.8	142.3	140.9	-1.0	-2.0
Food purchased from stores	(v41692193)	143.5	140.7	138.6	-1.5	-3.4
Meat	(v41692194)	159.4	155.9	156.0	0.1	-2.1
Dairy products	(v41692204)	145.4	139.7	138.6	-0.8	-4.7
Bakery and cereal products (excluding baby food)	(v41692209)	152.0	148.5	148.1	-0.3	-2.6
Fresh fruit	(v41692213)	146.6	142.3	139.3	-2.1	-5.0
Fresh vegetables	(v41692216)	145.6	143.9	137.6	-4.4	-5.5
Food purchased from restaurants	(v41692223)	144.1	146.0	146.4	0.3	1.6
Shelter	(v41692224)	160.4	160.6	161.2	0.4	0.5
Rented accommodation	(v41692225)	142.3	141.4	141.4	0.0	-0.6
Owned accommodation	(v41692227)	170.7	169.8	170.8	0.6	0.1
Homeowners' replacement cost	(v41692228)	227.8	221.8	221.8	0.0	-2.6
Homeowners' home and mortgage insurance	(v41692230)	270.9	273.9	273.9	0.0	1.1
Homeowners' maintenance and repairs	(v41692231)	143.3	146.0	146.0	0.0	1.9
Water, fuel and electricity	(v41692232)	152.3	156.1	156.5	0.3	2.8
Electricity	(v41692233)	154.9	162.7	162.7	0.0	5.0
Natural gas	(v41692235)	106.0	100.0	100.0	0.0	-5.7
Fuel oil and other fuels	(v41692236)	184.5	167.5	186.0	11.0	0.8
Household operations, furnishings and equipment	(v41692237)	112.2	114.7	115.2	0.4	2.7
Household operations	(v41692238)	123.5	124.0	124.8	0.6	1.1
Telephone services	(v41692240)	100.0	101.4	101.5	0.1	1.5
Internet access services (2002=100)	(v41693224)	115.1	121.7	122.5	0.7	6.4
Household furnishings and equipment	(v41692245)	92.4	98.1	98.3	0.2	6.4
Clothing and footwear	(v41692252)	99.7	100.9	101.2	0.3	1.5
Women's clothing	(v41692254)	87.9	88.6	88.8	0.2	1.0
Men's clothing	(v41692255)	90.7	92.4	93.8	1.5	3.4
Footwear	(v41692257)	101.1	102.7	101.8	-0.9	0.7
Transportation	(v41692260)	121.4	122.4	123.1	0.6	1.4
Private transportation	(v41692261)	120.6	121.2	122.0	0.7	1.2
Purchase and leasing of passenger vehicles	(v41692263)	97.0	100.2	101.0	0.8	4.1
Gasoline	(v41692266)	146.5	135.7	136.9	0.9	-6.6
Passenger vehicle insurance premiums	(v41692269)	137.9	138.9	138.9	0.0	0.7
Public transportation	(v41692271)	132.6	139.4	137.9	-1.1	4.0
Health and personal care	(v41692276)	120.1	121.4	122.0	0.5	1.6
Health care	(v41692277)	118.6	119.5	119.3	-0.2	0.6
Personal care	(v41692283)	122.3	124.2	126.0	1.4	3.0
Recreation, education and reading	(v41692286)	112.5	112.1	112.7	0.5	0.2
Recreation	(v41692287)	103.0	101.5	102.1	0.6	-0.9
Education and reading	(v41692295)	151.8	158.2	158.2	0.0	4.2
Alcoholic beverages and tobacco products	(v41692299)	163.0	167.1	167.8	0.4	2.9
Alcoholic beverages	(v41692300)	142.1	146.3	146.6	0.2	3.2
Tobacco products and smokers' supplies	(v41692306)	176.1	180.1	181.1	0.6	2.8

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

The Consumer Price Index – October 2016

Table 9-9

The Consumer Price Index, major components, selected sub-groups and special aggregates, provinces, Whitehorse and Yellowknife, not seasonally adjusted — Alberta

	CANSIM vector number	Indexes			Percentage change	
		October 2015	September 2016	October 2016	September 2016 to October 2016	October 2015 to October 2016
		2002=100			%	
All-items	(v41692327)	135.1	135.3	135.8	0.4	0.5
Special aggregates						
All-items excluding food	(v41692451)	134.3	134.6	135.4	0.6	0.8
All-items excluding food and energy	(v41692452)	132.2	133.6	134.2	0.4	1.5
All-items excluding energy	(v41692457)	133.5	134.6	134.9	0.2	1.0
All-items excluding gasoline	(v41693263)	134.4	135.2	135.5	0.2	0.8
Energy 1	(v41692458)	152.9	139.0	142.9	2.8	-6.5
All-items (1992=100)	(v41713424)	167.8	168.0	168.7	0.4	0.5
Food	(v41692328)	140.1	139.6	138.4	-0.9	-1.2
Food purchased from stores	(v41692329)	139.5	136.5	134.4	-1.5	-3.7
Meat	(v41692330)	156.5	151.7	153.0	0.9	-2.2
Dairy products	(v41692340)	141.9	138.5	136.3	-1.6	-3.9
Bakery and cereal products (excluding baby food)	(v41692345)	149.6	147.3	148.2	0.6	-0.9
Fresh fruit	(v41692349)	137.5	131.4	126.5	-3.7	-8.0
Fresh vegetables	(v41692352)	117.4	116.8	108.8	-6.8	-7.3
Food purchased from restaurants	(v41692359)	141.2	145.6	146.2	0.4	3.5
Shelter	(v41692360)	164.2	162.3	163.3	0.6	-0.5
Rented accommodation	(v41692361)	133.6	131.2	131.0	-0.2	-1.9
Owned accommodation	(v41692363)	175.3	175.2	176.9	1.0	0.9
Homeowners' replacement cost	(v41692364)	189.7	188.1	187.4	-0.4	-1.2
Homeowners' home and mortgage insurance	(v41692366)	351.4	356.3	359.4	0.9	2.3
Homeowners' maintenance and repairs	(v41692367)	125.9	128.2	129.5	1.0	2.9
Water, fuel and electricity	(v41692368)	158.7	151.9	152.5	0.4	-3.9
Electricity	(v41692369)	116.2	102.3	99.5	-2.7	-14.4
Natural gas	(v41692371)	175.9	175.7	182.3	3.8	3.6
Fuel oil and other fuels						
Household operations, furnishings and equipment	(v41692372)	120.0	120.7	121.6	0.7	1.3
Household operations	(v41692373)	133.4	133.8	135.3	1.1	1.4
Telephone services	(v41692375)	109.2	107.8	109.1	1.2	-0.1
Internet access services (200212=100)	(v41693225)	144.4	148.0	151.8	2.6	5.1
Household furnishings and equipment	(v41692380)	98.8	99.8	99.7	-0.1	0.9
Clothing and footwear	(v41692387)	97.4	96.4	98.0	1.7	0.6
Women's clothing	(v41692389)	80.3	81.8	83.9	2.6	4.5
Men's clothing	(v41692390)	91.5	89.9	90.9	1.1	-0.7
Footwear	(v41692392)	103.2	98.9	100.9	2.0	-2.2
Transportation	(v41692395)	130.3	130.9	132.4	1.1	1.6
Private transportation	(v41692396)	129.7	129.5	131.5	1.5	1.4
Purchase and leasing of passenger vehicles	(v41692398)	92.9	95.5	96.7	1.3	4.1
Gasoline	(v41692401)	157.6	140.0	146.6	4.7	-7.0
Passenger vehicle insurance premiums	(v41692404)	193.7	202.6	202.6	0.0	4.6
Public transportation	(v41692406)	136.0	142.5	141.0	-1.1	3.7
Health and personal care	(v41692411)	130.1	132.0	132.1	0.1	1.5
Health care	(v41692412)	140.6	142.2	142.3	0.1	1.2
Personal care	(v41692418)	119.6	121.7	121.8	0.1	1.8
Recreation, education and reading	(v41692421)	110.7	112.5	111.6	-0.8	0.8
Recreation	(v41692422)	102.6	104.0	102.9	-1.1	0.3
Education and reading	(v41692430)	141.6	145.1	145.5	0.3	2.8
Alcoholic beverages and tobacco products	(v41692434)	153.6	161.4	161.5	0.1	5.1
Alcoholic beverages	(v41692435)	135.4	138.9	139.0	0.1	2.7
Tobacco products and smokers' supplies	(v41692441)	171.2	184.5	184.7	0.1	7.9

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

The Consumer Price Index – October 2016

Table 9-10
The Consumer Price Index, major components, selected sub-groups and special aggregates, provinces, Whitehorse and Yellowknife, not seasonally adjusted — British Columbia

	CANSIM vector number	Indexes			Percentage change	
		October 2015	September 2016	October 2016	September 2016 to October 2016	October 2015 to October 2016
		2002=100			%	
All-items	(v41692462)	120.6	123.2	123.1	-0.1	2.1
Special aggregates						
All-items excluding food	(v41692587)	117.8	120.7	120.9	0.2	2.6
All-items excluding food and energy	(v41692588)	114.9	117.8	117.7	-0.1	2.4
All-items excluding energy	(v41692593)	118.4	120.9	120.7	-0.2	1.9
All-items excluding gasoline	(v41693265)	119.1	121.4	121.3	-0.1	1.8
Energy ¹	(v41692594)	148.5	151.1	154.8	2.4	4.2
All-items (1992=100)	(v41713427)	142.2	145.1	145.1	0.0	2.0
Food	(v41692463)	135.2	135.4	134.1	-1.0	-0.8
Food purchased from stores	(v41692464)	135.9	134.4	132.4	-1.5	-2.6
Meat	(v41692465)	149.6	146.5	144.0	-1.7	-3.7
Dairy products	(v41692475)	134.1	131.4	130.5	-0.7	-2.7
Bakery and cereal products (excluding baby food)	(v41692480)	142.4	141.3	142.1	0.6	-0.2
Fresh fruit	(v41692484)	142.3	133.5	133.7	0.1	-6.0
Fresh vegetables	(v41692487)	129.9	130.8	120.4	-8.0	-7.3
Food purchased from restaurants	(v41692494)	133.0	136.5	136.9	0.3	2.9
Shelter	(v41692495)	114.4	115.9	116.8	0.8	2.1
Rented accommodation	(v41692496)	116.3	117.4	117.6	0.2	1.1
Owned accommodation	(v41692498)	108.3	110.3	111.2	0.8	2.7
Homeowners' replacement cost	(v41692499)	108.4	114.7	115.2	0.4	6.3
Homeowners' home and mortgage insurance	(v41692501)	179.2	181.7	181.7	0.0	1.4
Homeowners' maintenance and repairs	(v41692502)	128.3	130.5	133.0	1.9	3.7
Water, fuel and electricity	(v41692503)	146.4	145.1	148.4	2.3	1.4
Electricity	(v41692504)	162.4	168.8	168.8	0.0	3.9
Natural gas	(v41692506)	98.5	85.4	93.6	9.6	-5.0
Fuel oil and other fuels	(v41692507)	210.5	200.9	214.7	6.9	2.0
Household operations, furnishings and equipment	(v41692508)	114.9	117.0	117.5	0.4	2.3
Household operations	(v41692509)	126.8	128.3	129.4	0.9	2.1
Telephone services	(v41692511)	109.9	108.1	109.0	0.8	-0.8
Internet access services (2002=100)	(v41693226)	145.2	149.2	152.8	2.4	5.2
Household furnishings and equipment	(v41692516)	93.2	96.7	95.8	-0.9	2.8
Clothing and footwear	(v41692523)	108.2	106.9	107.3	0.4	-0.8
Women's clothing	(v41692525)	91.8	91.9	91.8	-0.1	0.0
Men's clothing	(v41692526)	101.9	100.4	100.7	0.3	-1.2
Footwear	(v41692528)	111.3	106.7	109.3	2.4	-1.8
Transportation	(v41692531)	125.6	130.5	131.3	0.6	4.5
Private transportation	(v41692532)	124.7	129.5	130.6	0.8	4.7
Purchase and leasing of passenger vehicles	(v41692534)	94.6	97.6	98.5	0.9	4.1
Gasoline	(v41692537)	160.0	167.9	171.5	2.1	7.2
Passenger vehicle insurance premiums	(v41692540)	146.3	154.9	154.9	0.0	5.9
Public transportation	(v41692542)	133.2	138.4	137.2	-0.9	3.0
Health and personal care	(v41692547)	114.0	115.9	116.7	0.7	2.4
Health care	(v41692548)	117.6	120.6	120.3	-0.2	2.3
Personal care	(v41692554)	110.0	110.5	112.7	2.0	2.5
Recreation, education and reading	(v41692557)	116.4	123.0	120.0	-2.4	3.1
Recreation	(v41692558)	99.5	106.5	102.7	-3.6	3.2
Education and reading	(v41692566)	174.8	179.6	179.7	0.1	2.8
Alcoholic beverages and tobacco products	(v41692570)	137.6	141.9	142.4	0.4	3.5
Alcoholic beverages	(v41692571)	116.0	120.6	120.7	0.1	4.1
Tobacco products and smokers' supplies	(v41692577)	173.6	177.1	178.4	0.7	2.8

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

The Consumer Price Index – October 2016

Table 9-11

The Consumer Price Index, major components, selected sub-groups and special aggregates, provinces, Whitehorse and Yellowknife, not seasonally adjusted — Whitehorse (Yukon)

	CANSIM vector number	Indexes			Percentage change	
		October 2015	September 2016	October 2016	September 2016 to October 2016	October 2015 to October 2016
		2002=100			%	
All-Items	(v41692598)	124.5	125.9	126.1	0.2	1.3
Special aggregates						
All-items excluding food	(v41692711)	122.8	124.7	124.8	0.1	1.6
All-items excluding food and energy	(v41692712)	119.8	122.5	122.3	-0.2	2.1
All-items excluding energy	(v41692717)	122.4	124.3	124.3	0.0	1.6
All-items excluding gasoline	(v41693267)	123.7	125.3	125.5	0.2	1.5
Energy ¹	(v41692718)	146.1	141.3	143.5	1.6	-1.8
All-Items (1992=100)	(v41713430)	146.5	148.1	148.4	0.2	1.3
Food	(v41692599)	133.1	131.3	132.6	1.0	-0.4
Food purchased from stores	(v41692600)	137.0	133.6	135.4	1.3	-1.2
Meat	(v41692601)	142.8	136.6	138.9	1.7	-2.7
Dairy products	(v41692611)	136.9	133.4	131.7	-1.3	-3.8
Bakery and cereal products (excluding baby food)	(v41692616)	146.7	142.9	147.2	3.0	0.3
Fresh fruit	(v41692620)	128.3	112.6	126.7	12.5	-1.2
Fresh vegetables	(v41692623)	124.1	127.7	121.9	-4.5	-1.8
Food purchased from restaurants	(v41692630)	124.1	126.7	126.7	0.0	2.1
Shelter	(v41692631)	142.8	145.6	146.6	0.7	2.7
Rented accommodation	.	.	.	.	.	.
Owned accommodation	.	.	.	.	.	.
Homeowners' replacement cost	.	.	.	.	.	.
Homeowners' home and mortgage insurance	.	.	.	.	.	.
Homeowners' maintenance and repairs	.	.	.	.	.	.
Water, fuel and electricity	(v41692632)	149.3	146.3	150.2	2.7	0.6
Electricity	(v41692633)	119.6	123.6	123.6	0.0	3.3
Natural gas	.	.	.	.	.	.
Fuel oil and other fuels	(v41692635)	182.3	166.4	176.8	6.3	-3.0
Household operations, furnishings and equipment	(v41692636)	106.8	108.2	108.4	0.2	1.5
Household operations	(v41692637)	114.3	114.9	115.1	0.2	0.7
Telephone services	(v41692639)	98.8	98.0	98.8	0.8	0.0
Internet access services (2002=100)	(v41693227)	85.7	84.8	84.9	0.1	-0.9
Household furnishings and equipment	(v41692644)	93.9	96.9	97.0	0.1	3.3
Clothing and footwear	(v41692651)	99.0	99.5	100.4	0.9	1.4
Women's clothing	(v41692653)	83.7	78.6	80.4	2.3	-3.9
Men's clothing	(v41692654)	105.4	112.6	113.8	1.1	8.0
Footwear	(v41692656)	100.5	103.7	104.7	1.0	4.2
Transportation	(v41692659)	128.2	128.5	128.3	-0.2	0.1
Private transportation	(v41692660)	128.1	126.8	126.9	0.1	-0.9
Purchase and leasing of passenger vehicles	(v41692662)	101.7	102.9	104.3	1.4	2.6
Gasoline	(v41692665)	147.5	142.3	142.3	0.0	-3.5
Passenger vehicle insurance premiums	(v41692668)	210.3	213.8	213.8	0.0	1.7
Public transportation	(v41692670)	127.8	134.2	132.6	-1.2	3.8
Health and personal care	(v41692675)	120.1	121.5	122.3	0.7	1.8
Health care	(v41692676)	124.0	126.4	125.6	-0.6	1.3
Personal care	(v41692682)	115.5	116.1	118.4	2.0	2.5
Recreation, education and reading	(v41692685)	96.3	99.1	97.6	-1.5	1.3
Recreation	(v41692686)	89.6	91.9	90.2	-1.8	0.7
Education and reading	(v41692693)	132.7	138.7	139.0	0.2	4.7
Alcoholic beverages and tobacco products	(v41692695)	153.8	156.6	156.5	-0.1	1.8
Alcoholic beverages	(v41692696)	124.1	125.5	125.5	0.0	1.1
Tobacco products and smokers' supplies	(v41692702)	192.1	197.5	197.3	-0.1	2.7

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

The Consumer Price Index – October 2016

Table 9-12

The Consumer Price Index, major components, selected sub-groups and special aggregates, provinces, Whitehorse and Yellowknife, not seasonally adjusted — Yellowknife (Northwest Territories)

	CANSIM vector number	Indexes			Percentage change	
		October 2015	September 2016	October 2016	September 2016 to October 2016	October 2015 to October 2016
		2002=100			%	
All-items	(v41692722)	131.6	131.8	132.7	0.7	0.8
Special aggregates						
All-items excluding food	(v41692835)	129.9	130.2	131.2	0.8	1.0
All-items excluding food and energy	(v41692836)	124.4	125.8	126.5	0.6	1.7
All-items excluding energy	(v41692841)	127.2	128.4	129.0	0.5	1.4
All-items excluding gasoline	(v41693269)	131.0	131.5	132.3	0.6	1.0
Energy ¹	(v41692842)	178.3	165.2	169.3	2.5	-5.0
All-items (1992=100)	(v41713431)	153.1	153.4	154.3	0.6	0.8
Food	(v41692723)	141.1	140.7	140.7	0.0	-0.3
Food purchased from stores	(v41692724)	141.1	139.9	139.8	-0.1	-0.9
Meat	(v41692725)	182.4	182.6	185.2	1.4	1.5
Dairy products	(v41692735)	128.9	132.1	129.5	-2.0	0.5
Bakery and cereal products (excluding baby food)	(v41692740)	144.3	135.3	139.9	3.4	-3.0
Fresh fruit	(v41692744)	135.4	120.1	118.9	-1.0	-12.2
Fresh vegetables	(v41692747)	156.5	162.8	156.4	-2.7	1.2
Food purchased from restaurants	(v41692754)	139.6	142.2	142.2	0.0	1.9
Shelter²	(v41692755)	150.1	149.6	150.5	0.6	0.3
Rented accommodation	.	.	.	.	.	.
Owned accommodation	.	.	.	.	.	.
Homeowners' replacement cost	.	.	.	.	.	.
Homeowners' home and mortgage insurance	.	.	.	.	.	.
Homeowners' maintenance and repairs	.	.	.	.	.	.
Water, fuel and electricity	(v41692756)	190.6	180.4	185.1	2.6	-2.9
Electricity	(v41692757)	196.8	184.8	184.8	0.0	-6.1
Natural gas	.	.	.	.	.	.
Fuel oil and other fuels	(v41692759)	210.8	193.6	208.9	7.9	-0.9
Household operations, furnishings and equipment	(v41692760)	115.2	116.2	116.4	0.2	1.0
Household operations	(v41692761)	123.1	122.5	123.1	0.5	0.0
Telephone services	(v41692763)	98.9	98.2	99.3	1.1	0.4
Internet access services (200212=100)	(v41693228)	73.3	72.7	72.7	0.0	-0.8
Household furnishings and equipment	(v41692768)	98.3	102.4	101.8	-0.6	3.6
Clothing and footwear	(v41692775)	102.7	104.4	106.2	1.7	3.4
Women's clothing	(v41692777)	83.5	86.4	91.8	3.8	9.9
Men's clothing	(v41692778)	114.5	114.2	114.1	-0.1	-0.3
Footwear	(v41692780)	99.0	96.7	97.1	0.4	-1.9
Transportation	(v41692783)	125.5	126.3	128.3	1.6	2.2
Private transportation	(v41692784)	126.2	125.4	128.5	2.5	1.8
Purchase and leasing of passenger vehicles	(v41692786)	100.2	100.6	104.9	4.3	4.7
Gasoline	(v41692789)	145.2	133.4	135.4	1.5	-6.7
Passenger vehicle insurance premiums	(v41692792)	189.1	192.7	192.7	0.0	1.9
Public transportation	(v41692794)	126.5	132.8	131.2	-1.2	3.7
Health and personal care	(v41692799)	122.0	118.2	119.4	1.0	-2.1
Health care	(v41692800)	116.9	119.1	118.2	-0.8	1.1
Personal care	(v41692806)	126.7	118.9	121.4	2.1	-4.2
Recreation, education and reading	(v41692809)	104.6	104.8	105.2	0.4	0.6
Recreation	(v41692810)	100.3	100.3	100.8	0.5	0.5
Education and reading	(v41692817)	129.7	131.6	131.8	0.2	1.6
Alcoholic beverages and tobacco products	(v41692819)	163.9	168.8	169.4	0.4	3.4
Alcoholic beverages	(v41692820)	144.0	144.6	144.8	0.1	0.6
Tobacco products and smokers' supplies	(v41692826)	189.0	201.6	202.7	0.5	7.2

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

The Consumer Price Index – October 2016

Table 10
The All-items Consumer Price Index, provinces, Whitehorse, Yellowknife and Iqaluit, 1 not seasonally adjusted, historical data

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual average ²
	2002=100												
Newfoundland and Labrador (v41691244)													
2011	119.0	119.7	120.9	121.5	121.5	120.9	121.6	122.0	122.3	122.1	122.9	121.9	121.4
2012	122.5	123.0	123.9	125.2	124.5	123.5	123.6	124.0	124.5	124.8	124.3	123.5	123.9
2013	123.6	125.8	125.9	125.9	125.9	126.0	126.1	126.0	126.6	126.7	127.0	125.6	126.0
2014	126.7	127.6	128.4	128.8	129.2	129.1	128.9	129.1	129.1	129.0	127.9	126.8	128.4
2015	126.2	127.5	128.9	128.3	129.6	129.9	129.8	130.0	129.6	129.7	129.3	128.6	129.0
2016	129.2	129.6	130.3	130.9	131.5	133.0	134.2	133.9	134.5	134.9	..	..	..
Prince Edward Island (v41691379)													
2011	120.1	121.1	122.2	123.3	123.9	123.3	123.3	123.9	123.7	123.9	124.0	123.4	123.0
2012	123.6	124.8	125.6	126.3	125.9	125.2	125.2	125.6	126.2	126.5	125.9	124.9	125.5
2013	125.2	126.7	127.1	128.6	127.9	127.9	128.1	128.6	129.0	129.0	129.2	128.6	128.0
2014	129.2	130.1	130.9	130.5	130.6	130.5	130.4	130.2	130.5	130.5	129.3	128.1	130.1
2015	126.7	128.2	129.8	128.9	129.7	130.4	130.3	130.1	129.4	129.4	129.6	129.2	129.3
2016	129.1	129.6	130.2	131.1	131.4	131.8	131.1	130.6	130.6	131.9	..	..	..
Nova Scotia (v41691513)													
2011	120.4	120.9	122.3	122.9	123.2	122.5	122.8	123.2	123.8	123.9	124.0	122.7	122.7
2012	123.7	124.3	125.3	126.1	125.6	124.8	124.5	125.0	125.7	125.6	125.5	124.9	125.1
2013	125.4	126.7	126.7	126.8	126.4	126.4	126.4	126.6	127.3	126.7	126.7	126.7	126.6
2014	127.4	128.4	128.9	129.1	129.5	129.2	128.9	129.0	129.5	129.4	128.6	127.4	128.8
2015	126.9	128.0	129.6	129.5	130.2	130.2	130.1	130.0	129.5	129.8	129.2	128.9	129.3
2016	129.4	129.6	130.1	131.0	131.6	131.8	131.2	131.2	131.6	131.6	..	..	..
New Brunswick (v41691648)													
2011	117.2	118.2	119.4	120.0	120.5	119.9	120.3	120.7	120.9	120.8	121.3	120.4	120.0
2012	121.0	121.3	122.3	123.1	122.7	121.6	121.4	121.9	122.7	122.5	122.0	121.2	122.0
2013	121.5	123.1	123.3	122.8	122.6	122.5	122.6	123.0	123.5	123.5	123.5	123.5	123.0
2014	123.4	124.4	125.1	125.0	125.3	124.9	124.8	124.9	125.2	125.5	124.9	124.1	124.8
2015	123.1	124.2	125.5	124.9	126.1	126.2	126.3	126.2	125.6	125.9	125.8	125.5	125.4
2016	126.0	126.4	126.9	127.7	128.1	128.5	129.4	129.0	129.4	129.4	..	..	..
Quebec (v41691783)													
2011	116.4	116.7	118.3	118.5	118.9	118.2	118.3	118.5	118.7	119.0	119.3	118.7	118.3
2012	119.7	120.4	120.8	121.3	121.1	120.6	120.5	120.9	120.9	121.3	121.1	120.5	120.8
2013	120.4	122.1	121.8	121.8	121.9	121.8	121.8	121.9	122.0	121.6	121.8	121.5	121.7
2014	121.7	122.6	122.9	123.4	123.8	123.9	123.7	123.8	123.9	124.3	123.8	122.8	123.4
2015	122.6	123.9	124.7	124.7	125.3	125.2	125.3	125.2	125.1	125.2	124.9	124.4	124.7
2016	124.6	125.1	125.6	126.0	126.2	126.0	125.6	125.3	125.8	125.9	..	..	..
Ontario (v41691919)													
2011	117.8	118.0	119.4	119.9	120.9	120.2	120.5	120.6	121.1	121.0	121.0	120.3	120.1
2012	120.6	121.4	122.0	122.4	122.4	121.6	121.4	121.8	122.0	122.2	121.9	121.3	121.8
2013	121.3	122.8	123.2	122.9	123.0	123.2	123.4	123.4	123.5	123.3	123.3	123.1	123.0
2014	123.3	124.6	125.1	125.9	126.5	126.9	126.5	126.5	126.7	126.8	126.3	125.4	125.9
2015	125.3	126.2	127.1	126.9	127.7	128.2	128.4	128.0	127.8	127.9	127.9	127.5	127.4
2016	127.8	128.2	129.0	129.6	130.1	130.4	130.3	129.9	130.1	130.6	..	..	..
Manitoba (v41692055)													
2011	116.6	117.0	117.9	118.3	119.5	118.6	118.2	118.3	119.1	119.3	119.6	118.6	118.4
2012	118.9	119.0	119.5	120.4	120.8	120.3	120.3	120.5	121.0	121.3	121.1	120.2	120.3
2013	120.3	121.6	122.3	122.6	123.0	123.6	123.9	123.8	124.0	124.0	124.0	122.7	123.0
2014	123.4	124.3	125.1	125.4	126.2	126.0	125.8	125.6	125.8	125.6	125.4	124.5	125.3
2015	124.3	125.2	126.6	126.5	126.8	127.3	127.1	127.8	127.4	128.0	127.7	126.4	126.8
2016	126.9	126.6	127.8	128.1	128.9	130.0	129.0	129.2	129.0	129.4	..	..	..
Saskatchewan (v41692191)													
2011	120.1	120.3	121.4	121.6	122.6	121.7	121.8	122.1	123.0	123.0	123.4	122.4	122.0
2012	122.9	122.7	123.6	124.2	124.5	124.1	123.9	124.2	124.5	124.8	124.5	123.3	123.9
2013	123.5	124.9	125.2	125.4	126.0	126.2	125.9	126.7	126.4	126.7	126.3	126.1	125.7
2014	126.4	127.8	128.7	128.9	129.2	129.0	129.0	129.1	129.2	129.9	129.0	128.3	128.7
2015	128.2	129.3	130.5	130.5	131.1	131.5	131.4	131.6	131.0	131.7	131.7	130.6	130.8
2016	131.0	131.1	132.2	132.3	132.7	133.3	132.8	132.5	132.4	132.7	..	..	..

The Consumer Price Index – October 2016

Table 10 – continued

The All-items Consumer Price Index, provinces, Whitehorse, Yellowknife and Iqaluit, ¹ not seasonally adjusted, historical data

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual average ²
	2002=100												
Alberta (v41692327)													
2011	123.5	124.2	124.5	126.0	126.1	125.3	125.7	126.3	126.0	127.2	126.6	126.5	125.7
2012	127.1	126.6	126.6	127.0	126.6	126.9	126.8	127.6	127.8	128.0	127.3	126.5	127.1
2013	126.5	127.7	128.1	128.7	129.5	129.8	129.6	129.4	129.5	129.3	129.5	129.1	128.9
2014	129.9	130.8	133.1	132.2	132.8	132.3	132.9	132.7	132.9	133.2	132.1	131.5	132.2
2015	131.0	132.0	133.0	133.1	133.6	134.5	134.6	135.0	134.6	135.1	134.7	133.5	133.7
2016	133.7	133.8	135.0	135.1	135.6	136.3	135.6	135.9	135.3	135.8	..	..	..
British Columbia (v41692462)													
2011	114.8	115.2	116.1	116.3	117.1	116.5	116.6	116.9	117.3	117.4	117.5	116.5	116.5
2012	116.8	117.2	117.9	118.2	118.6	118.2	117.9	118.1	118.1	118.0	117.6	117.0	117.8
2013	117.1	118.3	118.5	117.2	117.9	117.6	117.9	118.0	118.1	117.7	117.4	117.0	117.7
2014	117.1	118.0	118.6	119.0	119.7	119.8	119.6	119.6	119.5	119.0	118.8	118.1	118.9
2015	118.0	118.9	119.8	119.6	120.6	120.7	120.8	121.0	121.0	120.6	120.8	120.4	120.2
2016	120.7	120.8	121.8	121.8	122.7	123.1	123.3	123.4	123.2	123.1	..	..	..
Whitehorse, Yukon (v41692598)													
2011	115.9	115.9	117.0	117.3	118.4	118.6	118.7	118.6	119.0	119.1	119.4	118.8	118.1
2012	118.8	119.0	120.1	120.7	121.5	121.3	121.4	121.5	121.4	121.6	121.6	121.1	120.8
2013	120.8	121.2	121.5	121.6	122.6	124.1	124.0	124.1	124.0	123.6	123.0	123.2	122.8
2014	123.4	124.0	124.3	124.4	125.1	125.3	125.2	125.1	124.9	124.3	123.9	123.1	124.4
2015	121.8	122.1	123.0	123.5	124.4	125.1	125.4	126.0	125.6	124.5	124.0	124.1	124.1
2016	124.1	123.7	124.2	124.4	125.2	126.6	126.4	126.4	125.9	126.1	..	..	..
Yellowknife, Northwest Territories (v41692722)													
2011	119.3	119.2	120.5	120.9	121.6	121.6	122.0	122.0	122.3	122.6	123.4	123.4	121.6
2012	124.1	123.1	123.6	125.1	124.9	124.5	124.3	124.3	123.9	124.4	124.9	124.8	124.3
2013	125.1	125.4	125.6	126.0	126.1	126.5	126.5	126.6	126.4	126.4	126.6	126.6	126.2
2014	127.0	127.9	128.0	127.7	128.7	128.8	128.7	129.0	128.7	129.0	129.0	128.7	128.4
2015	128.1	128.4	129.4	129.8	130.6	131.4	131.3	131.6	131.2	131.6	131.0	130.6	130.4
2016	130.7	131.0	131.6	131.9	131.9	132.6	132.4	132.1	131.8	132.7	..	..	..
Iqaluit, Nunavut (200212=100) (v41713432)													
2011	112.5	112.3	112.6	113.2	113.5	113.3	113.3	113.4	113.6	114.3	114.5	114.2	113.4
2012	114.2	114.4	114.4	114.9	115.9	116.1	116.1	115.9	115.9	115.2	115.3	115.1	115.3
2013	115.5	115.8	115.8	116.5	117.2	117.5	117.5	117.5	117.5	116.6	116.1	116.2	116.6
2014	116.7	117.2	117.3	117.7	118.1	118.7	118.9	119.0	118.8	118.4	118.1	117.9	118.1
2015	118.2	118.9	119.1	120.0	120.4	121.0	121.2	121.3	121.7	121.1	121.0	120.8	120.4
2016	121.0	121.7	122.1	122.8	123.1	123.7	125.0	124.9	124.5	123.8	..	..	..

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

The Consumer Price Index – October 2016

Table 11
The Consumer Price Index and selected sub-groups, by city, ¹ not seasonally adjusted

	CANSIM vector number	Indexes			Percentage change	
		October 2015	September 2016	October 2016	September 2016 to October 2016	October 2015 to October 2016
		2002=100			%	
St. John's, Newfoundland and Labrador						
All-items	(v41692846)	129.3	134.1	134.6	0.4	4.1
Shelter	(v41692847)	148.6	149.7	151.6	1.3	2.0
Rented accommodation	(v41692848)	129.6	129.6	129.9	0.2	0.2
Owned accommodation	(v41692849)	146.8	151.3	154.1	1.9	5.0
Water, fuel and electricity	(v41692850)	167.9	159.6	160.7	0.7	-4.3
All-items (1992=100)	(v41713405)	151.8	157.4	157.9	0.3	4.0
Charlottetown and Summerside, Prince Edward Island						
All-items	(v41692852)	128.9	130.1	131.3	0.9	1.9
Shelter	(v41692853)	128.9	128.1	129.6	1.1	0.5
Rented accommodation	(v41692854)	118.0	118.0	118.3	0.3	0.3
Owned accommodation	(v41692855)	117.4	118.1	119.0	0.8	1.4
Water, fuel and electricity	(v41692856)	173.1	166.2	171.6	3.2	-0.9
All-items (1992=100)	(v41713407)	151.0	152.4	153.8	0.9	1.9
Halifax, Nova Scotia						
All-items	(v41692858)	128.8	130.6	130.5	-0.1	1.3
Shelter	(v41692859)	135.0	135.2	135.3	0.1	0.2
Rented accommodation	(v41692860)	116.4	117.4	117.5	0.1	0.9
Owned accommodation	(v41692861)	132.9	133.1	133.5	0.3	0.5
Water, fuel and electricity	(v41692862)	166.4	165.2	164.3	-0.5	-1.3
All-items (1992=100)	(v41713409)	153.4	155.5	155.4	-0.1	1.3
Saint John, New Brunswick						
All-items	(v41692864)	125.7	129.3	129.2	-0.1	2.8
Shelter	(v41692865)	132.8	134.9	135.7	0.6	2.2
Rented accommodation	(v41692866)	117.7	118.6	118.7	0.1	0.8
Owned accommodation	(v41692867)	126.2	128.0	128.8	0.6	2.1
Water, fuel and electricity	(v41692868)	164.8	169.3	170.7	0.8	3.6
All-items (1992=100)	(v41713411)	148.6	152.8	152.8	0.0	2.8
Québec, Quebec						
All-items	(v41692870)	125.2	125.7	125.9	0.2	0.6
Shelter	(v41692871)	129.6	130.3	131.0	0.5	1.1
Rented accommodation	(v41692872)	122.4	123.6	123.7	0.1	1.1
Owned accommodation	(v41692873)	132.8	133.4	134.7	1.0	1.4
Water, fuel and electricity	(v41692874)	129.1	128.8	129.2	0.3	0.1
All-items (1992=100)	(v41713413)	145.4	146.1	146.3	0.1	0.6
Montréal, Quebec						
All-items	(v41692876)	125.6	126.4	126.3	-0.1	0.6
Shelter	(v41692877)	127.8	128.8	129.4	0.5	1.3
Rented accommodation	(v41692878)	118.0	119.0	119.1	0.1	0.9
Owned accommodation	(v41692879)	132.6	133.8	134.7	0.7	1.6
Water, fuel and electricity	(v41692880)	130.3	130.2	131.1	0.7	0.6
All-items (1992=100)	(v41713414)	145.3	146.2	146.1	-0.1	0.6
Ottawa-Gatineau, Ontario part, Ontario/Quebec ²						
All-items	(v41692882)	126.8	128.4	128.8	0.3	1.6
Shelter	(v41692883)	133.9	135.2	135.4	0.1	1.1
Rented accommodation	(v41692884)	116.7	117.3	117.4	0.1	0.6
Owned accommodation	(v41692885)	136.4	136.3	137.1	0.6	0.5
Water, fuel and electricity	(v41692886)	160.6	170.3	167.9	-1.4	4.5
All-items (1992=100)	(v41713416)	154.5	156.4	156.9	0.3	1.6
Toronto, Ontario						
All-items	(v41692888)	129.0	131.7	132.0	0.2	2.3
Shelter	(v41692889)	135.9	141.2	141.6	0.3	4.2
Rented accommodation	(v41692890)	118.7	119.9	120.0	0.1	1.1
Owned accommodation	(v41692891)	138.6	144.0	145.1	0.8	4.7
Water, fuel and electricity	(v41692892)	161.5	175.6	172.4	-1.8	6.7
All-items (1992=100)	(v41713417)	155.5	158.7	159.1	0.3	2.3

The Consumer Price Index – October 2016

Table 11 – continued

The Consumer Price Index and selected sub-groups, by city, ¹ not seasonally adjusted

	CANSIM vector number	Indexes			Percentage change	
		October 2015	September 2016	October 2016	September 2016 to October 2016	October 2015 to October 2016
		2002=100			%	
Thunder Bay, Ontario						
All-items	(v41692894)	122.8	124.4	125.1	0.6	1.9
Shelter	(v41692895)	116.6	118.6	120.0	1.2	2.9
Rented accommodation	(v41692896)	111.9	112.6	112.7	0.1	0.7
Owned accommodation	(v41692897)	108.5	108.2	109.4	1.1	0.8
Water, fuel and electricity	(v41692898)	162.4	174.3	178.4	2.4	9.9
All-items (1992=100)	(v41713418)	146.5	148.4	149.2	0.5	1.8
Winnipeg, Manitoba						
All-items	(v41692900)	127.8	128.8	129.2	0.3	1.1
Shelter	(v41692901)	137.8	140.2	140.9	0.5	2.2
Rented accommodation	(v41692902)	129.4	130.7	130.9	0.2	1.2
Owned accommodation	(v41692903)	143.8	145.6	146.7	0.8	2.0
Water, fuel and electricity	(v41692904)	126.5	132.2	132.3	0.1	4.6
All-items (1992=100)	(v41713420)	157.5	158.8	159.3	0.3	1.1
Regina, Saskatchewan						
All-items	(v41692906)	132.4	133.1	133.4	0.2	0.8
Shelter	(v41692907)	161.0	161.4	161.9	0.3	0.6
Rented accommodation	(v41692908)	140.7	140.8	140.9	0.1	0.1
Owned accommodation	(v41692909)	173.1	172.8	173.7	0.5	0.3
Water, fuel and electricity	(v41692910)	149.0	152.2	152.3	0.1	2.2
All-items (1992=100)	(v41713422)	164.9	165.8	166.2	0.2	0.8
Saskatoon, Saskatchewan						
All-items	(v41692912)	132.0	132.8	133.1	0.2	0.8
Shelter	(v41692913)	158.8	159.3	159.9	0.4	0.7
Rented accommodation	(v41692914)	146.3	145.9	146.0	0.1	-0.2
Owned accommodation	(v41692915)	162.7	161.6	162.6	0.6	-0.1
Water, fuel and electricity	(v41692916)	160.6	167.0	167.1	0.1	4.0
All-items (1992=100)	(v41713423)	162.5	163.4	163.8	0.2	0.8
Edmonton, Alberta						
All-items	(v41692918)	134.8	135.2	135.7	0.4	0.7
Shelter	(v41692919)	163.1	162.0	163.1	0.7	0.0
Rented accommodation	(v41692920)	141.1	140.3	140.3	0.0	-0.6
Owned accommodation	(v41692921)	163.8	163.8	165.3	0.9	0.9
Water, fuel and electricity	(v41692922)	182.9	176.9	178.5	0.9	-2.4
All-items (1992=100)	(v41713425)	164.4	164.8	165.4	0.4	0.6
Calgary, Alberta						
All-items	(v41692924)	135.7	135.7	136.3	0.4	0.4
Shelter	(v41692925)	164.9	162.7	163.7	0.6	-0.7
Rented accommodation	(v41692926)	129.4	126.7	126.5	-0.2	-2.2
Owned accommodation	(v41692927)	182.7	182.3	184.2	1.0	0.8
Water, fuel and electricity	(v41692928)	141.1	134.2	133.8	-0.3	-5.2
All-items (1992=100)	(v41713426)	170.7	170.8	171.4	0.4	0.4
Vancouver, British Columbia						
All-items	(v41692930)	122.4	125.4	125.4	0.0	2.5
Shelter	(v41692931)	118.5	120.3	121.4	0.9	2.4
Rented accommodation	(v41692932)	117.9	119.4	119.6	0.2	1.4
Owned accommodation	(v41692933)	115.8	118.2	119.3	0.9	3.0
Water, fuel and electricity	(v41692934)	136.0	134.4	138.1	2.8	1.5
All-items (1992=100)	(v41713428)	145.3	148.8	148.8	0.0	2.4
Victoria, British Columbia						
All-items	(v41692936)	119.0	121.5	121.3	-0.2	1.9
Shelter	(v41692937)	110.1	111.4	112.1	0.6	1.8
Rented accommodation	(v41692938)	116.2	117.3	117.6	0.3	1.2
Owned accommodation	(v41692939)	99.0	100.5	101.2	0.7	2.2
Water, fuel and electricity	(v41692940)	176.9	178.1	179.7	0.9	1.6
All-items (1992=100)	(v41713429)	139.8	142.6	142.4	-0.1	1.9

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

The Consumer Price Index – October 2016

Table 12
The All-items Consumer Price Index by city, ¹ not seasonally adjusted, historical data

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual average ²
2002=100													
St. John's, Newfoundland and Labrador (v41692846)													
2011	119.1	119.7	120.7	121.3	121.5	120.8	121.5	121.9	122.1	122.1	122.7	121.9	121.3
2012	122.4	122.9	123.7	125.0	124.4	123.3	123.4	123.8	124.3	124.6	124.1	123.4	123.8
2013	123.4	125.5	125.6	125.6	125.6	125.8	125.8	125.8	126.4	126.5	126.8	126.4	125.8
2014	126.5	127.4	128.2	128.6	129.0	128.8	128.7	128.9	128.8	128.8	127.6	126.6	128.2
2015	126.1	127.2	128.7	128.1	129.4	129.7	129.5	129.7	129.2	129.3	128.9	128.4	128.7
2016	128.9	129.3	129.9	130.6	131.2	132.7	133.8	133.5	134.1	134.6	..	..	..
Charlottetown and Summerside, Prince Edward Island (v41692852)													
2011	119.7	120.6	121.7	122.7	123.3	122.7	122.7	123.2	123.1	123.3	123.4	122.7	122.4
2012	122.9	124.1	124.8	125.5	125.1	124.5	124.5	124.9	125.5	125.7	125.2	124.2	124.7
2013	124.4	125.9	126.3	127.8	127.1	127.1	127.4	127.8	128.3	128.3	128.5	127.8	127.2
2014	128.4	129.2	130.0	129.6	129.7	129.6	129.6	129.4	129.7	129.8	128.6	127.5	129.3
2015	126.3	127.7	129.2	128.4	129.1	129.7	129.7	129.6	128.9	128.9	129.1	128.7	128.8
2016	128.6	129.2	129.8	130.6	130.8	131.2	130.6	130.1	130.1	131.3	..	..	..
Halifax, Nova Scotia (v41692858)													
2011	119.5	120.0	121.3	121.9	122.1	121.5	121.8	122.2	122.8	122.9	122.9	121.6	121.7
2012	122.4	123.0	124.0	124.8	124.2	123.5	123.3	123.8	124.5	124.4	124.3	123.7	123.8
2013	124.1	125.2	125.3	125.4	125.1	125.0	125.1	125.2	126.0	125.4	125.5	125.4	125.2
2014	126.0	127.0	127.6	127.7	128.2	127.7	127.5	127.7	128.2	128.2	127.4	126.2	127.5
2015	125.8	126.9	128.4	128.3	128.9	128.9	128.9	128.8	128.4	128.8	128.1	127.7	128.2
2016	128.2	128.4	129.0	129.9	130.5	130.6	130.1	130.1	130.6	130.5	..	..	..
Saint John, New Brunswick (v41692864)													
2011	117.5	118.5	119.8	120.2	120.7	120.1	120.6	120.9	121.1	121.0	121.5	120.6	120.2
2012	121.0	121.4	122.4	123.2	122.8	121.8	121.6	122.0	122.8	122.6	122.1	121.4	122.1
2013	121.5	123.1	123.4	122.8	122.6	122.5	122.6	122.9	123.5	123.5	123.5	123.4	122.9
2014	123.4	124.4	125.2	125.0	125.3	124.8	124.7	124.7	125.1	125.4	124.7	123.9	124.7
2015	123.0	124.1	125.3	124.8	125.9	126.0	126.1	125.9	125.4	125.7	125.6	125.4	125.3
2016	125.9	126.3	126.8	127.6	127.9	128.3	129.2	128.9	129.3	129.2	..	..	..
Québec, Quebec (v41692870)													
2011	116.3	116.6	118.2	118.4	118.8	118.1	118.2	118.5	118.7	119.0	119.3	118.7	118.2
2012	119.8	120.4	120.8	121.3	121.2	120.6	120.6	121.0	121.1	121.4	121.3	120.6	120.8
2013	120.6	122.3	122.1	122.0	122.1	122.0	122.0	122.2	121.8	121.9	121.6	121.6	121.9
2014	121.9	122.7	123.0	123.6	123.9	124.0	123.8	124.0	124.1	124.5	123.9	122.9	123.5
2015	122.7	123.9	124.8	124.8	125.3	125.2	125.3	125.2	125.1	125.2	124.9	124.4	124.7
2016	124.5	125.0	125.5	125.9	126.2	125.9	125.5	125.3	125.7	125.9	..	..	..
Montréal, Quebec (v41692876)													
2011	116.3	116.5	118.1	118.3	118.6	117.9	118.0	118.2	118.4	118.8	119.0	118.4	118.0
2012	119.4	120.0	120.4	120.9	120.7	120.2	120.2	120.5	120.5	120.9	120.8	120.1	120.4
2013	120.1	121.7	121.4	121.4	121.6	121.4	121.5	121.5	121.5	121.4	121.6	121.2	121.4
2014	121.5	122.3	122.6	123.2	123.5	123.6	123.5	123.7	123.8	124.1	123.8	122.9	123.2
2015	122.9	124.1	124.8	124.9	125.4	125.3	125.3	125.3	125.3	125.6	125.1	124.7	124.9
2016	124.8	125.4	125.8	126.2	126.6	126.2	125.9	125.8	126.4	126.3	..	..	..
Ottawa-Gatineau, Ontario part, Ontario/Quebec (v41692882) ³													
2011	117.9	118.2	119.5	120.0	121.0	120.2	120.4	120.5	121.1	121.1	121.0	120.3	120.1
2012	120.6	121.4	122.0	122.4	122.3	121.4	121.3	121.7	121.9	122.1	121.9	121.2	121.7
2013	121.3	122.7	123.1	122.8	122.9	123.0	123.3	123.2	123.3	123.1	123.0	122.8	122.9
2014	123.0	124.2	124.7	125.3	125.9	126.3	125.9	125.9	126.1	126.1	125.5	124.7	125.3
2015	124.5	125.4	126.2	126.0	126.9	127.4	127.6	127.1	126.8	126.8	126.8	126.3	126.5
2016	126.5	126.8	127.5	128.1	128.7	128.8	128.7	128.2	128.4	128.8	..	..	..
Toronto, Ontario (v41692888)													
2011	117.5	117.9	119.4	119.8	120.8	120.2	120.4	120.5	121.2	121.1	120.9	120.2	120.0
2012	120.7	121.5	122.0	122.4	122.4	121.7	121.6	121.8	122.1	122.3	122.0	121.4	121.8
2013	121.5	122.9	123.3	123.1	123.2	123.4	123.6	123.7	123.8	123.7	123.6	123.4	123.3
2014	123.7	125.0	125.5	126.4	127.0	127.4	126.9	126.9	127.2	127.4	126.9	126.2	126.4
2015	126.3	127.2	127.9	127.7	128.5	128.8	129.2	128.7	129.0	129.0	129.1	128.7	128.3
2016	129.0	129.4	130.3	130.7	131.2	131.5	131.4	131.1	131.7	132.0	..	..	..

The Consumer Price Index – October 2016

Table 12 – continued

The All-items Consumer Price Index by city,¹ not seasonally adjusted, historical data

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual average ²
2002=100													
Thunder Bay, Ontario (v41692894)													
2011	114.2	114.2	115.5	116.3	117.3	116.5	116.7	116.8	117.5	117.4	117.2	116.4	116.3
2012	116.5	117.3	117.9	118.1	118.0	117.1	116.8	117.2	117.4	117.9	117.6	116.8	117.4
2013	116.8	118.4	118.6	118.1	118.3	118.5	118.7	118.7	118.6	118.8	118.9	118.8	118.4
2014	118.9	120.0	120.4	121.1	121.7	122.1	121.7	121.6	121.6	121.6	121.2	120.3	121.0
2015	120.2	121.1	122.0	121.6	122.6	123.2	123.3	122.8	122.5	122.8	122.9	122.5	122.3
2016	122.8	123.1	123.8	124.3	124.9	125.0	124.8	124.3	124.4	125.1	..	..	..
Winnipeg, Manitoba (v41692900)													
2011	116.3	116.7	117.6	117.9	119.1	118.3	117.9	118.0	118.8	119.0	119.3	118.3	118.1
2012	118.6	118.7	119.2	120.0	120.4	120.0	119.9	120.2	120.6	120.9	120.8	119.9	119.9
2013	120.0	121.3	121.9	122.2	122.6	123.1	123.4	123.4	123.6	123.6	123.7	122.4	122.6
2014	123.1	123.9	124.7	124.9	125.8	125.6	125.4	125.2	125.4	125.3	125.1	124.3	124.9
2015	124.2	125.0	126.5	126.3	126.6	127.0	126.8	127.6	127.2	127.8	127.4	126.2	126.6
2016	126.7	126.4	127.6	127.8	128.6	129.6	128.8	128.9	128.8	129.2	..	..	..
Regina, Saskatchewan (v41692906)													
2011	120.5	120.7	121.8	121.9	123.0	122.1	122.3	122.5	123.6	123.6	123.9	123.0	122.4
2012	123.5	123.3	124.2	124.8	125.1	124.7	124.6	124.9	125.2	125.6	125.3	124.1	124.6
2013	124.4	125.8	126.3	126.5	127.0	127.2	126.9	126.7	127.4	127.7	127.4	127.2	126.7
2014	127.4	128.7	129.7	129.9	130.2	129.9	129.9	130.1	130.2	130.9	129.9	129.2	129.7
2015	128.9	130.1	131.4	131.4	131.9	132.4	132.2	132.4	131.7	132.4	132.4	131.3	131.5
2016	131.5	131.6	132.9	133.1	133.5	134.2	133.5	133.2	133.1	133.4	..	..	..
Saskatoon, Saskatchewan (v41692912)													
2011	120.9	121.1	122.1	122.2	123.3	122.3	122.5	122.7	123.5	123.6	123.9	122.9	122.6
2012	123.4	123.2	124.0	124.6	125.0	124.6	124.4	124.6	124.9	125.2	125.0	123.7	124.4
2013	123.8	125.0	125.3	125.4	126.0	126.1	125.9	125.7	126.4	126.6	126.2	126.0	125.7
2014	126.4	127.7	128.6	128.6	129.0	128.8	128.8	129.0	129.1	129.9	129.1	128.5	128.6
2015	128.5	129.6	130.7	130.7	131.3	131.7	131.6	131.8	131.4	132.0	132.0	131.0	131.0
2016	131.5	131.6	132.7	132.7	133.1	133.6	133.1	132.9	132.8	133.1	..	..	..
Edmonton, Alberta (v41692918)													
2011	123.9	124.3	124.8	126.2	126.5	126.6	125.9	126.6	126.4	127.6	126.9	126.7	126.0
2012	127.3	126.9	127.0	127.4	127.0	127.2	127.1	127.9	128.1	128.5	127.7	127.0	127.4
2013	126.8	128.0	128.3	129.0	129.7	130.0	129.5	129.4	129.5	129.2	129.3	128.9	129.0
2014	129.6	130.4	132.5	131.9	132.1	132.1	132.4	132.2	132.3	132.8	131.9	131.1	131.8
2015	130.5	131.6	132.6	132.8	133.3	134.1	134.1	134.7	134.4	134.8	134.5	133.2	133.4
2016	133.4	133.3	134.7	135.0	135.4	136.2	135.3	135.6	135.2	135.7	..	..	..
Calgary, Alberta (v41692924)													
2011	123.3	124.2	124.3	125.6	125.8	124.9	125.5	125.9	125.7	126.9	126.3	126.2	125.4
2012	126.7	126.3	126.3	126.7	126.2	126.5	126.4	127.2	127.5	127.5	126.9	126.0	126.7
2013	126.3	127.5	127.9	128.5	129.3	129.7	129.6	129.3	129.5	129.4	129.6	129.3	128.8
2014	130.2	131.2	133.8	132.6	133.5	132.8	133.4	133.4	133.6	133.7	132.6	132.1	132.7
2015	131.7	132.6	133.6	133.6	134.1	135.0	135.1	135.5	135.1	135.7	135.3	134.1	134.3
2016	134.3	134.4	135.5	135.5	135.9	136.6	135.9	136.3	135.7	136.3	..	..	..
Vancouver, British Columbia (v41692930)													
2011	115.8	116.0	117.0	117.2	118.0	117.5	117.5	117.7	118.3	118.5	118.7	117.7	117.5
2012	117.9	118.4	119.1	119.4	119.8	119.5	119.2	119.4	119.3	119.3	118.9	118.3	119.0
2013	118.5	119.8	120.0	118.5	119.3	119.0	119.3	119.5	119.6	119.3	119.0	118.5	119.2
2014	118.7	119.5	120.3	120.7	121.2	121.4	121.2	121.2	121.2	120.6	120.5	119.6	120.5
2015	119.7	120.6	121.5	121.3	122.4	122.4	122.5	122.7	122.7	122.4	122.7	122.4	121.9
2016	122.7	122.8	124.0	124.0	124.9	125.3	125.7	125.6	125.4	125.4	..	..	..
Victoria, British Columbia (v41692936)													
2011	114.0	114.3	115.2	115.4	116.2	115.5	115.5	115.8	116.2	116.4	116.5	115.4	115.5
2012	115.7	116.1	116.9	117.3	117.6	117.1	116.7	116.9	116.8	116.8	116.8	115.6	116.7
2013	115.8	116.9	117.1	115.8	116.5	116.2	116.4	116.5	116.5	116.2	116.0	115.6	116.3
2014	115.7	116.5	117.0	117.3	118.0	118.1	118.0	118.0	117.9	117.5	117.4	116.7	117.3
2015	116.7	117.4	118.2	118.1	119.0	119.2	119.3	119.4	119.5	119.0	119.0	118.7	118.6
2016	118.9	119.1	120.0	120.0	121.0	121.3	121.7	121.8	121.5	121.3	..	..	..

Note(s): The all-items index for Whitehorse and Yellowknife are available from table 10.
See "Data quality, concepts and methodology — Explanatory notes for tables" section.

The Consumer Price Index – October 2016

Table 13
Average retail prices for gasoline and fuel oil, by city

	St. John's, N.L.	Charlottetown and Summerside, P.E.I.	Halifax, N.S.	Saint John, N.B.	Québec, Que.	Montréal, Que.	Ottawa, Ont.	Toronto, Ont.	Thunder Bay, Ont.	Winnipeg, Man.
	cents per litre									
Regular unleaded gasoline at self service filling stations										
October 2015	103.2	100.2	98.3	97.6	103.7	111.8	98.2	100.8	118.6	103.6
November 2015	103.1	98.0	99.1	97.8	104.5	110.9	100.5	103.0	116.8	98.4
December 2015	98.0	97.5	96.9	97.0	102.3	109.0	96.0	100.4	108.6	86.6
January 2016	93.0	93.1	93.6	92.6	97.9	102.4	86.9	95.7	98.0	83.2
February 2016	89.7	86.7	86.2	86.9	90.1	98.1	85.1	89.8	87.1	74.7
March 2016	89.3	88.2	87.3	86.2	96.4	97.7	90.6	92.5	96.9	85.0
April 2016	101.5	99.9	100.3	96.8	101.7	109.4	99.8	102.3	103.6	90.3
May 2016	104.3	103.2	102.7	100.3	103.9	111.6	104.5	106.1	108.8	94.8
June 2016	126.2	104.7	106.0	104.9	107.0	110.8	104.9	106.1	123.5	112.7
July 2016	121.7	98.4	97.0	98.7	99.9	106.2	100.9	102.4	118.6	95.5
August 2016	122.8	96.4	95.9	97.2	101.2	108.2	99.3	101.1	115.0	95.0
September 2016	127.4	100.4	102.1	102.3	103.5	111.0	98.8	100.9	110.4	94.8
October 2016	130.7	105.6	105.3	104.8	106.1	115.8	103.7	105.4	108.2	99.2
Premium unleaded gasoline at self service filling stations										
October 2015	109.5	108.1	106.9	105.5	117.0	126.1	114.4	118.0	133.1	119.6
November 2015	109.3	105.9	107.0	105.4	118.2	124.8	117.2	120.0	131.5	113.9
December 2015	105.1	105.2	105.5	104.4	115.9	122.8	113.9	117.9	123.2	102.5
January 2016	99.9	100.2	101.7	99.9	111.9	116.7	103.2	113.2	113.3	99.3
February 2016	96.4	94.4	94.7	94.2	104.1	112.4	102.2	107.1	103.1	90.0
March 2016	95.6	95.9	95.7	93.5	110.2	112.4	107.2	110.1	114.7	101.8
April 2016	107.6	107.6	108.9	104.8	116.0	122.7	116.6	119.5	119.3	107.7
May 2016	110.8	111.0	111.1	108.1	118.1	124.6	121.5	123.5	124.5	112.2
June 2016	132.4	112.8	113.9	111.0	121.4	125.6	121.9	123.4	139.2	129.8
July 2016	128.6	106.0	105.6	106.4	114.4	121.1	117.6	119.5	134.4	112.8
August 2016	129.1	104.2	103.9	104.6	116.1	123.0	116.2	118.8	130.9	112.4
September 2016	134.1	108.2	110.1	109.9	117.7	126.1	115.6	117.9	126.5	112.3
October 2016	136.0	113.5	113.3	112.2	119.6	130.7	119.7	122.5	124.2	116.3
Household heating fuel										
October 2015	82.7	83.9	93.0	97.9	85.8	86.7	95.3	103.2	109.0	100.6
November 2015	81.7	83.9	90.4	100.2	91.9	90.1	104.1	109.7	109.0	99.7
December 2015	80.4	81.9	88.3	96.2	85.4	91.6	106.7	108.4	108.5	87.3
January 2016	70.4	74.1	84.1	88.8	82.0	83.7	102.8	99.8	100.2	79.6
February 2016	67.6	73.1	81.5	84.2	77.4	80.9	98.6	96.4	92.4	75.6
March 2016	66.7	73.1	81.6	81.8	77.0	82.0	99.0	97.1	94.4	81.3
April 2016	67.7	76.3	84.8	77.1	71.6	80.3	99.0	96.6	91.1	80.3
May 2016	76.0	71.1	87.4	83.3	69.7	81.4	99.0	97.3	95.6	83.5
June 2016	82.6	74.8	88.3	89.9	81.2	87.1	92.6	99.8	102.0	89.3
July 2016	82.8	74.8	88.8	90.3	82.0	85.9	92.6	99.8	101.2	90.7
August 2016	74.8	70.0	88.8	82.6	76.2	83.3	92.6	96.4	99.0	87.9
September 2016	79.8	73.7	89.3	90.4	79.7	81.4	92.6	94.8	99.5	90.8
October 2016	82.7	79.1	87.7	99.0	85.0	86.6	94.3	98.6	106.3	97.1

The Consumer Price Index – October 2016

Table 13 – continued

Average retail prices for gasoline and fuel oil, by city

	Regina, Sask.	Saskatoon, Sask.	Edmonton, Alta.	Calgary, Alta.	Vancouver, B.C.	Victoria, B.C.	Whitehorse, Y.T.	Yellowknife, N.W.T.
cents per litre								
Regular unleaded gasoline at self service filling stations								
October 2015	103.7	104.1	98.0	104.8	116.6	108.7	119.8	127.2
November 2015	101.3	99.7	89.1	99.7	124.7	116.3	114.3	119.7
December 2015	88.5	87.6	81.5	86.2	122.9	113.9	101.2	112.4
January 2016	80.5	77.7	73.3	80.3	110.7	103.7	98.2	107.3
February 2016	72.5	74.0	63.1	73.5	105.9	98.1	90.8	96.5
March 2016	86.9	84.4	78.1	84.6	112.9	105.9	94.7	104.4
April 2016	88.2	90.4	83.7	90.4	114.7	105.9	98.8	108.4
May 2016	94.6	95.3	90.0	95.7	120.0	112.6	107.2	113.4
June 2016	109.7	107.8	102.4	105.6	121.6	114.9	121.6	122.9
July 2016	94.4	91.8	86.1	92.8	124.1	113.9	117.3	119.4
August 2016	96.6	96.8	89.4	96.3	119.7	112.6	115.9	118.2
September 2016	95.0	97.3	87.6	92.7	125.6	116.3	115.9	116.5
October 2016	97.1	98.1	94.1	95.4	128.3	119.5	115.9	118.2
Premium unleaded gasoline at self service filling stations								
October 2015	119.5	119.3	115.9	122.4	133.1	125.2	130.9	142.9
November 2015	117.0	115.2	107.0	116.8	141.3	132.8	125.0	136.7
December 2015	104.1	103.4	99.3	104.1	139.5	130.4	113.6	135.0
January 2016	95.4	93.6	91.2	97.7	127.3	120.1	109.2	126.8
February 2016	88.4	89.5	80.4	91.3	122.7	114.8	105.4	112.7
March 2016	102.5	100.4	96.4	103.4	129.6	123.0	107.3	115.0
April 2016	104.4	105.6	102.1	108.8	131.8	122.6	111.7	118.0
May 2016	111.3	111.2	109.0	114.3	136.5	126.0	119.3	119.8
June 2016	123.9	124.3	121.2	123.3	138.7	131.7	131.7	130.9
July 2016	110.2	108.2	105.0	111.5	141.2	131.4	128.5	129.9
August 2016	113.0	112.6	107.9	114.7	137.6	130.6	126.3	128.7
September 2016	111.3	113.5	105.8	110.0	143.8	136.2	126.5	128.2
October 2016	113.2	114.5	111.0	113.6	146.6	137.7	126.5	128.5
Household heating fuel								
October 2015	98.6	98.2	.	.	102.5	113.1	104.7	100.3
November 2015	94.1	95.2	.	.	104.2	113.2	106.1	99.4
December 2015	91.6	87.1	.	.	93.0	109.2	103.6	94.5
January 2016	83.0	78.8	.	.	83.6	103.9	101.2	90.0
February 2016	78.1	74.1	.	.	81.2	101.1	88.6	84.7
March 2016	81.1	79.2	.	.	84.7	102.1	89.6	82.1
April 2016	81.6	77.4	.	.	85.3	104.2	89.3	84.4
May 2016	84.5	83.4	.	.	94.5	104.2	90.0	84.4
June 2016	90.0	91.7	.	.	105.0	106.7	91.0	89.3
July 2016	89.1	89.3	.	.	108.1	106.7	90.3	92.1
August 2016	86.2	88.6	.	.	103.0	106.7	89.6	92.1
September 2016	88.8	89.1	.	.	104.1	106.7	95.6	92.1
October 2016	95.7	99.9	.	.	108.8	110.1	101.5	99.4

Note(s): See Table A for complete list of vector numbers.

The Consumer Price Index – October 2016

Table 14
Average retail prices, monthly, Canada

	CANSIM vector number	August 2016	September 2016	October 2016
		dollars ¹		
Round steak, 1 kilogram	(v735165)	18.32	17.85	18.08
Sirloin steak, 1 kilogram	(v735176)	23.75	23.99	23.74
Prime rib roast, 1 kilogram	(v735187)	31.24	31.36	30.52
Blade roast, 1 kilogram	(v735198)	16.30	15.85	16.13
Stewing beef, 1 kilogram	(v735209)	16.53	16.10	16.17
Ground beef, regular, 1 kilogram	(v735220)	12.19	12.40	12.36
Pork chops, 1 kilogram	(v735221)	12.60	12.55	12.29
Chicken, 1 kilogram	(v735223)	7.49	7.46	7.53
Bacon, 500 grams	(v735166)	6.91	6.86	6.58
Wieners, 450 grams	(v735167)	4.10	4.31	4.48
Canned sockeye salmon, 213 grams	(v735168)	4.42	4.37	4.23
Homogenized milk, 1 litre	(v735169)	2.45	2.46	2.47
Partly skimmed milk, 1 litre	(v735170)	2.30	2.31	2.30
Butter, 454 grams	(v735171)	4.92	4.83	4.66
Processed cheese food slices, 250 grams	(v735172)	2.67	2.69	2.83
Evaporated milk, 385 millilitres	(v735173)	1.92	1.86	1.87
Eggs, 1 dozen	(v735174)	3.35	3.37	3.08
Bread, 675 grams	(v735175)	2.99	2.92	2.86
Soda crackers, 450 grams	(v735177)	3.20	3.09	3.12
Macaroni, 500 grams	(v735178)	1.57	1.50	1.46
Flour, 2.5 kilograms	(v735179)	5.06	4.88	4.72
Corn flakes, 675 grams	(v735180)	5.03	4.79	4.71
Apples, 1 kilogram	(v735181)	4.48	4.38	3.99
Bananas, 1 kilogram	(v735182)	1.62	1.59	1.60
Grapefruits, 1 kilogram	(v735183)	3.76	3.88	4.24
Oranges, 1 kilogram	(v735184)	3.43	3.40	3.40
Apple juice, canned, 1.36 litres	(v735185)	2.12	2.06	2.04
Orange juice, tetra-brick, 1 litre	(v735186)	4.08	4.01	3.83
Carrots, 1 kilogram	(v735189)	2.22	1.96	1.77
Celery, 1 kilogram	(v735190)	2.26	2.16	2.08
Mushrooms, 1 kilogram	(v735191)	8.71	8.64	8.75
Onions, 1 kilogram	(v735192)	2.70	2.12	1.83
Potatoes, 4.54 kilograms	(v735193)	7.13	6.44	6.17
French fried potatoes, frozen, 1 kilogram	(v735194)	2.69	2.58	2.62
Baked beans, canned, 398 millilitres	(v735195)	1.31	1.27	1.36
Tomatoes, canned, 796 millilitres	(v735196)	1.59	1.58	1.56
Tomato juice, canned, 1.36 litres	(v735197)	2.50	2.47	2.34
Ketchup, 1 litre	(v735199)	3.43	3.31	3.31
Sugar, white, 2 kilograms	(v735200)	2.88	2.80	2.72
Coffee, roasted, 300 grams	(v735201)	6.33	6.21	6.23
Coffee, instant, 200 grams	(v735202)	6.93	6.68	6.83
Tea (72 bags)	(v735203)	4.68	4.46	4.51
Cooking or salad oil, 1 litre	(v735204)	4.18	3.96	3.94
Soup, canned, 284 millilitres	(v735205)	1.15	1.11	1.11
Baby food, 128 millilitres	(v735206)	0.95	0.95	0.95
Peanut butter, 500 grams	(v735207)	3.56	3.42	3.42
Fruit flavoured crystals, 2.25 litres	(v735208)	1.98	1.90	1.87
Soft drinks, cola type, 2 litres	(v735210)	2.08	2.04	2.02
Soft drinks, lemon-lime type, 2 litres	(v735211)	1.96	1.92	1.88
Paper towels (2 rolls)	(v735213)	2.66	2.63	2.65
Facial tissue (200 tissues)	(v735214)	2.77	2.75	2.78
Bathroom tissue (4 rolls)	(v735215)	2.67	2.53	2.59
Shampoo, 300 millilitres	(v735216)	3.86	3.87	3.81
Deodorant, 60 grams	(v735217)	4.55	4.49	4.57
Toothpaste, 100 millilitres	(v735218)	2.61	2.68	2.75
Cigarettes (200)	(v735219)	101.37	101.78	102.48
Regular, unleaded gasoline at self-service stations, cents per litre	(v41838376)	101.9	102.8	106.7

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.

The Consumer Price Index – October 2016

Table 15
Inter-city indexes of price differentials, as of October 2015, of consumer goods and services

	Canada CPI weight ¹	St. John's, Newfoundland and Labrador	Charlottetown and Summerside, Prince Edward Island	Halifax, Nova Scotia	Saint John, New Brunswick	Montréal, Quebec
	%	combined city average=100				
All-items	100.0	98	95	101	95	94
Food	16.4	108	105	103	107	100
Food purchased from stores	.	107	109	106	109	101
Meat, poultry and fish	.	102	111	108	111	101
Dairy products and eggs	.	106	101	100	101	104
Bakery and other cereal products	.	99	105	102	105	102
Fruit and vegetables	.	119	117	110	118	99
Other food purchased from stores ²	.	105	106	104	103	98
Food purchased from restaurants	.	110	96	97	103	98
Shelter	26.8	91	82	98	77	85
Rented accommodation	.	76	65	83	59	81
Owned accommodation	.	85	72	89	70	88
Water, fuel and electricity	.	135	141	153	130	85
Household operations, furnishings and equipment	13.1	103	102	102	100	96
Household operations	.	103	102	104	101	94
Household furnishings and equipment	.	102	100	99	97	103
Clothing and footwear	6.1	101	101	102	101	102
Transportation	19.1	99	92	95	94	101
Private transportation	.	99	90	94	92	101
Purchase of passenger vehicles	.	101	102	103	101	103
Gasoline	.	99	98	95	94	107
Other private transportation	.	96	71	83	80	97
Public transportation	.	100	100	100	106	100
Health and personal care	4.7	96	99	103	99	99
Health care	.	97	100	105	96	98
Personal care	.	95	98	101	103	100
Recreation, education and reading	10.9	87	101	107	103	83
Recreation	.	103	100	104	100	99
Education and reading	.	60	102	112	109	56
Alcoholic beverages and tobacco products	2.9	110	113	114	106	95
Alcoholic beverages	.	107	106	108	104	99
Tobacco products and smokers' supplies	.	116	124	123	110	89

The Consumer Price Index – October 2016

Table 15 – continued

Inter-city indexes of price differentials, as of October 2015, of consumer goods and services

	Canada CPI weight ¹	Ottawa, Ontario	Toronto, Ontario	Winnipeg, Manitoba	Regina, Saskatchewan	Edmonton, Alberta	Vancouver, British Columbia
	%	combined city average=100					
All-items	100.0	103	109	95	99	101	104
Food	16.4	101	101	101	101	98	101
Food purchased from stores	.	103	100	99	102	98	101
Meat, poultry and fish	.	104	99	96	103	100	99
Dairy products and eggs	.	104	102	95	100	95	98
Bakery and other cereal products	.	98	97	102	103	101	103
Fruit and vegetables	.	103	97	101	105	100	105
Other food purchased from stores ²	.	104	102	102	99	95	101
Food purchased from restaurants	.	97	103	105	99	96	101
Shelter	26.8	108	119	89	100	111	114
Rented accommodation	.	103	117	84	88	109	118
Owned accommodation	.	106	114	93	96	113	116
Water, fuel and electricity	.	121	136	88	130	110	98
Household operations, furnishings and equipment	13.1	105	107	95	94	99	105
Household operations	.	107	109	94	93	101	106
Household furnishings and equipment	.	100	101	100	98	92	100
Clothing and footwear	6.1	101	100	100	98	95	100
Transportation	19.1	97	107	97	95	97	96
Private transportation	.	95	107	97	94	96	97
Purchase of passenger vehicles	.	101	101	100	98	93	100
Gasoline	.	83	96	99	98	94	110
Other private transportation	.	87	121	91	88	102	85
Public transportation	.	109	109	100	98	98	89
Health and personal care	4.7	104	104	99	103	98	99
Health care	.	104	104	96	107	103	98
Personal care	.	103	104	101	99	92	99
Recreation, education and reading	10.9	106	112	88	105	99	103
Recreation	.	100	103	97	101	96	103
Education and reading	.	115	128	74	113	105	104
Alcoholic beverages and tobacco products	2.9	97	97	115	112	108	101
Alcoholic beverages	.	98	98	106	106	107	100
Tobacco products and smokers' supplies	.	95	97	130	122	110	102

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" and "User information - Note to users" sections and Table B for complete list of vector numbers.

Explanatory notes for tables

Table 1 The Consumer Price Index, major components and special aggregates, Canada, not seasonally adjusted

1. 2013 Consumer Price Index (CPI) basket weights at December 2014 prices, Canada.
2. Figures may not add to 100% due to rounding.
3. The Bank of Canada's core index excludes eight of the Consumer Price Index's most volatile components (fruit, fruit preparations and nuts; vegetables and vegetable preparations; mortgage interest cost; natural gas; fuel oil and other fuels; gasoline; inter-city transportation; and tobacco products and smokers' supplies) as well as the effects of changes in indirect taxes on the remaining components. For additional information on the core index, please consult the Bank of Canada website: www.bankofcanada.ca/rates/indicators/key-variables/inflation-control-target/.

Table 2 The Consumer Price Index, major components and special aggregates, Canada, seasonally adjusted

1. 2013 Consumer Price Index (CPI) basket weights at December 2014 prices, Canada.
2. A seasonally adjusted series is one from which seasonal movements have been eliminated. Each month, the previous month's seasonally adjusted index is subject to revision. On an annual basis, the seasonally adjusted values for the last three years are revised with the January data release. Users employing Consumer Price Index data for indexation purposes are advised to use the unadjusted indexes. For more information on the availability and uses of seasonally adjusted CPI data, please see the *Definitions, data sources and methods* section of survey 2301.
3. The Bank of Canada's core index excludes eight of the Consumer Price Index's most volatile components (fruit, fruit preparations and nuts; vegetables and vegetable preparations; mortgage interest cost; natural gas; fuel oil and other fuels; gasoline; inter-city transportation; and tobacco products and smokers' supplies) as well as the effects of changes in indirect taxes on the remaining components. For additional information on the core index, please consult the Bank of Canada website: www.bankofcanada.ca/rates/indicators/key-variables/inflation-control-target/.

Table 3 The Consumer Price Index, provinces, Whitehorse, Yellowknife and Iqaluit, not seasonally adjusted

1. Data for Iqaluit are on a December 2002=100 base (200212=100) and the Standard Geographical Classification (SGC) 2001. Previous to April 1, 1999, the town of Iqaluit formed part of the Northwest Territories. On April 1, 1999, the town of Iqaluit formed part of the newly-created territory of Nunavut.

Table 4 The Consumer Price Index, major components and selected sub-groups, Canada, not seasonally adjusted

Table 4-7

1. From April 2006, Statistics Canada changed its implementation of the price index formula used for traveller accommodation. As a result, data from April 2006 are not strictly comparable to earlier time periods.

Table 5 The Consumer Price Index for Canada, All-items CPI, not seasonally adjusted, historical data

1. The annual average index is calculated as the average of the published 12 individual monthly indexes, rounded to one decimal place. Percentage changes between the annual average indexes are calculated based on these published rounded numbers. Between May 2007 and September 2007, the annual average percentage changes in Table 5 were calculated based on annual average indexes that were not rounded. As a result, some percentage changes were different by +/- 0.1 from the official percentage change. This problem only affected the annual average column of Table 5.

Table 6 The Bank of Canada's core index, not seasonally adjusted, historical data

1. The Bank of Canada's core index excludes eight of the Consumer Price Index's most volatile components (fruit, fruit preparations and nuts; vegetables and vegetable preparations; mortgage interest cost; natural gas; fuel oil and other fuels; gasoline; inter-city transportation; and tobacco products and smokers' supplies) as well as the effects of changes in indirect taxes on the remaining components. For additional information on the core index, please consult the Bank of Canada website: www.bankofcanada.ca/rates/indicators/key-variables/inflation-control-target/.
2. The annual average index is calculated as the average of the published 12 individual monthly indexes, rounded to one decimal place. Percentage changes between the annual average indexes are calculated based on these published rounded numbers.

Table 7 The Consumer Price Index for Canada, major components and special aggregates, not seasonally adjusted, historical data

1. Goods are physical or tangible commodities usually classified according to their life span into non-durable goods, semi-durable goods and durable goods. Non-durable goods are those goods that can be used up entirely in less than a year, assuming normal usage. For example, fresh food products, disposable cameras and gasoline are non-durable goods. Semi-durable goods are those goods that may last less than 12 months or greater than 12 months depending on the purpose to which they are put. For example, clothing, footwear and household textiles are semi-durable goods. Durable goods are those goods which may be used repeatedly or continuously over more than a year, assuming normal usage. For example, cars, audio and video equipment and furniture are durable goods.
2. A service in the Consumer Price Index (CPI) is characterized by valuable work performed by an individual or organization on behalf of a consumer, for example, car tune-ups, haircuts and city public transportation. Transactions classified as a service may include the cost of goods by their nature. Examples include food in restaurant food services and materials in clothing repair services.
3. The special aggregate "energy" includes: "electricity", "natural gas", "fuel oil and other fuels", "gasoline", and "fuel, parts and accessories for recreational vehicles".
4. The annual index level is the average of the 12 individual monthly indexes.

Table 8 Annual average percentage changes for the Consumer Price Index

Table 8-1

1. The annual index level is the average of the 12 individual monthly indexes. The percentage change for a given calendar year is calculated using the annual average indexes.

Table 8-2

1. The annual index level is the average of the 12 individual monthly indexes. The percentage change for a given calendar year is calculated using the annual average indexes.
2. Data for Iqaluit are on a December 2002=100 base (200212=100) and the Standard Geographical Classification (SGC) 2001. Previous to April 1, 1999, the town of Iqaluit formed part of the Northwest Territories. On April 1, 1999, the town of Iqaluit formed part of the newly-created territory of Nunavut.

Table 9 The Consumer Price Index, major components, selected sub-groups and special aggregates, provinces, Whitehorse and Yellowknife, not seasonally adjusted

Tables 9-1, 9-2, 9-3, 9-4, 9-5, 9-6, 9-7, 9-8, 9-9, 9-10 and 9-11

1. The special aggregate "energy" includes: "electricity", "natural gas", "fuel oil and other fuels", "gasoline", and "fuel, parts and accessories for recreational vehicles".

Table 9-12

1. The special aggregate "energy" includes: "electricity", "natural gas", "fuel oil and other fuels", "gasoline", and "fuel, parts and accessories for recreational vehicles".
2. Part of the increase first recorded in the shelter index for Yellowknife for December 2004 inadvertently reflected rent increases that actually occurred earlier. As a result, the change in the shelter index was overstated in December 2004, and was understated in the previous two years. The shelter index series for Yellowknife has been corrected from December 2002. In addition, the Yellowknife All-items Consumer Price Index (CPI) and some Yellowknife special aggregate index series have also changed. Data for Canada and all other provinces and territories were not affected.

Table 10 The All-items Consumer Price Index, provinces, Whitehorse, Yellowknife and Iqaluit, not seasonally adjusted, historical data

1. Data for Iqaluit are on a December 2002=100 base (200212=100) and the Standard Geographical Classification (SGC) 2001. Previous to April 1, 1999, the town of Iqaluit formed part of the Northwest Territories. On April 1, 1999, the town of Iqaluit formed part of the newly-created territory of Nunavut.
2. The annual index level is the average of the 12 individual monthly indexes.

Table 11 The Consumer Price Index and selected sub-groups, by city, not seasonally adjusted

1. With the introduction of the 1992 basket in January 1995, emphasis was shifted from city data to provincial data. City all-items series were continued since many users had come to rely on this service, but the method of calculation was changed. Shelter indexes are calculated for each city. This recognizes the importance of shelter in the basket, the significant and persistent differences in price movements between cities, and the availability of local data. For the other seven major components, the movement of the provincial counterpart is used except in the cases of Montréal, Toronto, and Vancouver, where a sub-provincial counterpart is used. The major components are aggregated using the city's expenditure pattern to arrive at each city's all-items index.
2. Formerly Ottawa (Ottawa-Gatineau, Ontario part), represents Ottawa only.

Table 12 The All-items Consumer Price Index by city, not seasonally adjusted, historical data

1. With the introduction of the 1992 basket in January 1995, emphasis was shifted from city data to provincial data. City all-items series were continued since many users had come to rely on this service, but the method of calculation was changed. Shelter indexes are calculated for each city. This recognizes the importance of shelter in the basket, the significant and persistent differences in price movements between cities, and the availability of local data. For the other seven major components, the movement of the provincial counterpart is used except in the cases of Montréal, Toronto, and Vancouver, where a sub-provincial counterpart is used. The major components are aggregated using the city's expenditure pattern to arrive at each city's all-items index.
2. The annual index level is the average of the 12 individual monthly indexes.
3. Formerly Ottawa (Ottawa-Gatineau, Ontario part), represents Ottawa only.

Table 14 Average retail prices, monthly, Canada

1. Prices are expressed in dollars, except for the price of gasoline which is expressed in cents per litre.

Average retail prices for food, household supplies, personal care items, cigarettes and gasoline

Table 14 shows, for the current month and the two previous months, average prices for selected food, household supplies, personal care items, cigarettes and for gasoline.

Prices for these items are collected as part of the regular monthly Consumer Price Index (CPI) survey. Prices for the selected food, household supply and personal care items are observed in food supermarkets and drug stores, while prices for cigarettes are collected in supermarkets, department stores, drug stores and tobacco shops. Prices for regular unleaded self-serve gasoline are collected at gas stations. In each geographic area defined for pricing purposes, the average prices of each product are weighted by the population of the area in question to calculate the average Canadian retail price of each product. For regular unleaded self-serve gasoline, average city prices are weighted by provincial volume supplied and cities' population to calculate the Canada average retail price.

Products that are priced can vary in quality between outlets or between geographic areas. Brands and outlets can also vary from month to month. Therefore, average prices may not necessarily be fully comparable from one month to another and should not be used as an appropriate measure of pure price change through time. A matched product and outlet sample is used for the CPI to determine the pure price movement of products through time.

Table 15 Inter-city indexes of price differentials, as of October 2015, of consumer goods and services**Purpose and Scope**

Table 15 shows estimates of price differences between 11 Canadian cities in all 10 provinces, as of October 2015. These estimates are based on a selection of products (goods and services) purchased by consumers in each of the 11 cities.

These estimates should not be interpreted as a measure of differences in the cost-of-living between cities. The indexes provide price comparisons for a selection of products only, and are not meant to give an exhaustive comparison of all goods and services purchased by consumers. Additionally, the shelter price concept used for these indexes is not conducive to making cost-of-living type comparisons between cities (see below).

Methodology

In order to produce optimal Inter-city indexes, product comparisons were initially made by pairing cities that are in close geographic proximity. The resulting price level comparisons were then extended to include comparisons between all of the cities, using a chaining procedure. The following initial pairings were used:

St. John's	Halifax
Charlottetown-Summerside	Halifax
Saint John	Halifax
Halifax	Ottawa
Montréal	Toronto
Ottawa	Toronto
Toronto	Winnipeg
Regina	Winnipeg
Edmonton	Winnipeg
Vancouver	Edmonton

Reliable Inter-city price comparisons require that the selected products be very similar across cities. This ensures that the variation in index levels between cities is due to pure price differences and not to differences in the attributes of the products, such as size and/or quality.

Within each city pair, product price quotes were matched on the basis of detailed descriptions. Whenever possible, products were matched by brand, quantity and with some regard for the comparability of retail outlets from which they were selected.

Additionally, the target prices for this study are final prices and as such, include all sales taxes and levies applied to consumer products within a city. This can be an important source of variation when explaining differences in inter-city price levels.

It should be noted that price data for the Inter-city indexes is drawn from the sample of monthly price data collected for the Consumer Price Index (CPI). Given that the CPI sample is optimized to produce accurate price comparisons through time, and not across regions, the number of matched price quotes between cities can be small. It should also be noted that, especially in periods when prices are highly volatile, the timing of the product price comparison can significantly affect city-to-city price relationships.

The weights used to aggregate the different product indexes within a city are based on the combined consumption expenditures of households living in the 11 cities tracked. As such, one set of weights is used for all 11 cities. Currently, 2013 expenditures are used to derive the weights. These expenditures are expressed in October 2015 prices.

The Inter-city index for a particular city is compared to the weighted average of all 11 cities, which is equal to 100. For example, an index value of 102 for a particular city means that prices for the measured commodities are 2% higher than the weighted, combined city average.

Additional Information on Shelter

Shelter prices were absent from the Inter-city index program prior to 1999 because of methodological and conceptual issues associated with their measurement. The diverse nature of shelter means that accurate matches between cities are often difficult to make.

To account for some of these difficulties, a rental equivalence approach is used to construct the Inter-city price indexes for owned accommodation. Such an approach uses market rents as an approximation to the cost of the shelter services consumed by homeowners in each city. It is important to note that this approach may not be suitable for the needs of all users. For instance, since the rental equivalence approach does not represent an out-of-pocket expenditure, the indexes should not be used for measuring differences in the purchasing power of homeowners across cities.

Footnotes for Table 15

1. The weights shown are rounded 2013 basket weights at December 2014 prices for Canada. They are provided for illustration only; the weights actually used are combined city weights with adjustments for price changes up until October 2015.
2. Includes the following subgroups: sugar and syrup, confectionery items, margarine, other edible fat and oil items, coffee, tea, condiments, spices and vinegar, soup, infant and junior foods, pre-cooked frozen food preparations, non-alcoholic beverages and all other food preparations.

Data quality, concepts and methodology

Definition

The Consumer Price Index (CPI) is an indicator of the changes in consumer prices experienced by the target population. The CPI measures price change by comparing, through time, the cost of a fixed basket of goods and services. The CPI basket is based on the expenditures of the target population in a certain reference period. A list of baskets and reference months is available in **The Canadian Consumer Price Index Reference Paper**, catalogue no. 62-553-X. Since a basket contains goods and services of unchanging or equivalent quantity and quality, the index reflects only pure price movements.

Separate CPIs are published for Canada, the ten provinces, Whitehorse, Yellowknife and Iqaluit. Some CPI information is also available for an additional sixteen urban centres. Since the CPI is a measure of price change from one time period to another, it cannot be used to indicate differences in price levels between provinces or urban centres.

Population coverage

The population targeted by the CPI consists of families and individuals living in urban and rural private households. For practical reasons, residents of the Territories outside Whitehorse, Yellowknife and Iqaluit are not represented by the index. Prior to January 1995, the target population consisted of private households in Canadian urban centres with a population of 30,000 or more.

Time base

The CPI compares, in percentage terms, prices in any given time period to prices in the official base period which, at present, is 2002=100. The official time base was changed from 1992=100 to 2002=100 starting with the CPI for May 2007. The change is strictly an arithmetic conversion which alters the index levels but leaves the percentage changes between any two periods intact, except for differences in rounding.

Percent versus index point changes

The movements of the indexes from one month to another are expressed as percent changes rather than changes in index points. Index point changes are affected by the level of the index which, in turn, depends on the time base of the particular index. The percentage change between any two time periods can be readily calculated by dividing the index point difference between the two time periods by the index for the earlier period and multiplying the result by one hundred.

Price coverage

The prices used in the CPI calculation are final prices, inclusive of excise and other indirect taxes paid by consumers. In particular, they include the Goods and Services Tax (GST), as well as provincial retail sales taxes wherever applicable. In regions where the GST and provincial retail sales taxes have been combined, the Harmonized Sales Tax (HST) is included. It follows that the CPI can change as a result of modifications to any of these taxes.

The selection of products and the outlets from which prices are collected is judgmental, other than for rents and traveler accommodation. The number of prices required for a given good or service depends on the importance and the nature of the product. The samples are designed to represent volume selling goods and services and outlets. The principal objective of the sample design is to ensure an informative, reliable and impartial picture of consumer inflation at the national and provincial levels.

The prices of most of the goods and services surveyed for the CPI are usually collected in the first two weeks of the reference month. Food prices are collected in the first three weeks, while gasoline prices are collected in four weeks of each month. Although prices for most CPI goods and services are collected monthly, prices for products having less frequent price changes (e.g. property taxes and electricity rates) are collected at intervals longer than one month. Special pricings are carried out where there is evidence that significant price changes have occurred between scheduled pricing periods.

Weights and linking

The CPI maintains fixed quantitative proportions (weights) between goods and services during the life of a given basket. The baskets are updated periodically to take into account changes in consumer expenditure patterns. In February 2015, with the release of the January 2015 CPI, the basket reflecting the 2013 expenditure patterns replaced the 2011 basket. The continuity of the CPI series is maintained by "linking" the corresponding indexes obtained from consecutive baskets.

The CPI is calculated as a weighted average of specified goods and services price indexes. The weights are derived from Survey of Household Spending data.

When reconstructing or re-aggregating published CPI series, the changes in weights and the linking procedures must be taken into account. For a description of the methodology required to reconstruct or re-aggregate CPI series, see *The Canadian Consumer Price Index Reference Paper*, catalogue no. 62-553-X (Occasional), or contact Consumer Prices Division.

Bank of Canada's core index

Starting with the October 2006 Consumer Price Index (CPI), Statistics Canada produces and disseminates the Bank of Canada's core index as defined by the Bank of Canada.

The Bank of Canada's core index excludes eight of the Consumer Price Index's most volatile components (fruit, fruit preparations and nuts; vegetables and vegetable preparations; mortgage interest cost; natural gas; fuel oil and other fuels; gasoline; inter-city transportation; and tobacco products and smokers' supplies) as well as the effects of changes in indirect taxes on the remaining components. For additional information on the core index, please consult the Bank of Canada website: www.bankofcanada.ca/rates/indicators/key-variables/inflation-control-target/.

Statistics Canada also calculates, on behalf of the Bank of Canada, a seasonally adjusted core index. This series is available through *CANSIM*, Statistics Canada's official database, or by contacting us through the means mentioned on the inside cover of this publication.

Whitehorse, Yellowknife and Iqaluit indexes

The relatively small size of the housing market in these three cities makes it difficult to construct reliable price indexes for new houses. To compensate, the price movements of rental accommodation are used to approximate the price movements of new houses. The rent information itself is collected using different pricing frequencies and collection methods than in the rest of the country. Because of these problems, the indexes for Rented Accommodation and Owned Accommodation are not published for these three cities. Further, the all-items indexes published for these three cities are not strictly comparable with the same indexes for the provinces or the other sixteen cities.

Calculation of city indexes

With the introduction of the 1992 basket, emphasis was shifted from city data to provincial data. City all-items series were continued since many users had come to rely on this service, but the method of calculation was changed. Shelter indexes are calculated for each city. This recognizes the importance of Shelter in the basket, the significant and persistent differences in price movements between cities, and the availability of local data. For the other seven major components, the movement of the provincial counterpart (or, in the cases of Montréal, Toronto, and Vancouver, a sub-provincial counterpart) is used. The major components are aggregated using the city's expenditure pattern to arrive at each city's all-items index.

Seasonal adjustment

A seasonally adjusted series is one from which seasonal movements have been eliminated. Seasonal movements are defined as those which are caused by regular annual events such as variations in climate and regular institutional events such as vacations and statutory holidays. Seasonally adjusted series are calculated using Statistics Canada's X-12 ARIMA program. Time series with no detectable seasonal movements remain unchanged from the official series. The official unadjusted series for the all-items index, the Bank of Canada's core index, each of the eight major component indexes and three special aggregates (all-items excluding food, all-items excluding food and energy and all-items excluding eight of the most volatile components [Bank of Canada definition]) are seasonally adjusted independently.

Each month, the previous month's seasonally adjusted index is subject to revision. On an annual basis, the seasonally adjusted values for the last three years are revised with the January data release. Since these revisions can lead to changes in both the levels and movements of the indexes, users employing the CPI for indexation purposes are advised to use the unadjusted indexes.

Appendix I

Concordance tables

Table A

Vector numbers for the average retail prices for gasoline and fuel oil, by urban centre

	St. John's, N.L.	Charlottetown and Summerside, P.E.I.	Halifax, N.S.	Saint John, N.B.	Québec, Que.	Montréal, Que.	Ottawa, Ont.	Toronto, Ont.	Thunder Bay, Ont.	Winnipeg, Man.
Regular unleaded gasoline at self service filling stations	(v735082)	(v735092)	(v735093)	(v735094)	(v735095)	(v735096)	(v735097)	(v735098)	(v735099)	(v735083)
Premium unleaded gasoline at self service filling stations	(v735100)	(v735110)	(v735111)	(v735112)	(v735113)	(v735114)	(v735115)	(v735116)	(v735117)	(v735101)
Household heating fuel	(v735149)	(v735157)	(v735158)	(v735159)	(v735160)	(v735161)	(v735162)	(v735163)	(v735164)	(v735150)
	Regina, Sask.	Saskatoon, Sask.	Edmonton, Alta.	Calgary, Alta.	Vancouver, B.C.	Victoria, B.C.	Whitehorse, Y.T.	Yellowknife, N.W.T.		
Regular unleaded gasoline at self service filling stations	(v735084)	(v735085)	(v735086)	(v735087)	(v735088)	(v735089)	(v735090)	(v735091)		
Premium unleaded gasoline at self service filling stations	(v735102)	(v735103)	(v735104)	(v735105)	(v735106)	(v735107)	(v735108)	(v735109)		
Household heating fuel	(v735151)	(v735152)			(v735153)	(v735154)	(v735155)	(v735156)		

Table B
Vector numbers of the inter-city indexes of price differentials of consumer goods and services

	St. John's, Newfoundland and Labrador	Charlottetown and Summerside, Prince Edward Island	Halifax, Nova Scotia	Saint John, New Brunswick	Montréal, Quebec
All-items	(v15939841)	(v15939869)	(v15939897)	(v15939925)	(v15939953)
Food	(v15939842)	(v15939870)	(v15939898)	(v15939926)	(v15939954)
Food purchased from stores	(v15939843)	(v15939871)	(v15939899)	(v15939927)	(v15939955)
Meat, poultry and fish	(v15939844)	(v15939872)	(v15939900)	(v15939928)	(v15939956)
Dairy products and eggs	(v15939845)	(v15939873)	(v15939901)	(v15939929)	(v15939957)
Bakery and other cereal products	(v15939846)	(v15939874)	(v15939902)	(v15939930)	(v15939958)
Fruit and vegetables	(v15939847)	(v15939875)	(v15939903)	(v15939931)	(v15939959)
Other food purchased from stores	(v15939848)	(v15939876)	(v15939904)	(v15939932)	(v15939960)
Food purchased from restaurants	(v15939849)	(v15939877)	(v15939905)	(v15939933)	(v15939961)
Shelter	(v15939850)	(v15939878)	(v15939906)	(v15939934)	(v15939962)
Rented accommodation	(v21580949)	(v21580952)	(v21580955)	(v21580958)	(v21580961)
Owned accommodation	(v21580950)	(v21580953)	(v21580956)	(v21580959)	(v21580962)
Water, fuel and electricity	(v21580951)	(v21580954)	(v21580957)	(v21580960)	(v21580963)
Household operations, furnishings and equipment	(v15939851)	(v15939879)	(v15939907)	(v15939935)	(v15939963)
Household operations	(v15939852)	(v15939880)	(v15939908)	(v15939936)	(v15939964)
Household furnishings and equipment	(v15939853)	(v15939881)	(v15939909)	(v15939937)	(v15939965)
Clothing and footwear	(v15939854)	(v15939882)	(v15939910)	(v15939938)	(v15939966)
Transportation	(v15939855)	(v15939883)	(v15939911)	(v15939939)	(v15939967)
Private transportation	(v15939856)	(v15939884)	(v15939912)	(v15939940)	(v15939968)
Purchase of passenger vehicles	(v15939857)	(v15939885)	(v15939913)	(v15939941)	(v15939969)
Gasoline	(v15939858)	(v15939886)	(v15939914)	(v15939942)	(v15939970)
Other private transportation	(v15939859)	(v15939887)	(v15939915)	(v15939943)	(v15939971)
Public transportation	(v15939860)	(v15939888)	(v15939916)	(v15939944)	(v15939972)
Health and personal care	(v15939861)	(v15939889)	(v15939917)	(v15939945)	(v15939973)
Health care	(v15939862)	(v15939890)	(v15939918)	(v15939946)	(v15939974)
Personal care	(v43975161)	(v43975162)	(v43975163)	(v43975164)	(v43975165)
Recreation, education and reading	(v15939865)	(v15939893)	(v15939921)	(v15939949)	(v15939977)
Recreation	(v43975172)	(v43975173)	(v43975174)	(v43975175)	(v43975176)
Education and reading	(v43975183)	(v43975184)	(v43975185)	(v43975186)	(v43975187)
Alcoholic beverages and tobacco products	(v15939866)	(v15939894)	(v15939922)	(v15939950)	(v15939978)
Alcoholic beverages	(v15939867)	(v15939895)	(v15939923)	(v15939951)	(v15939979)
Tobacco products and smokers' supplies	(v15939868)	(v15939896)	(v15939924)	(v15939952)	(v15939980)

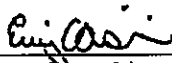
The Consumer Price Index – October 2016

Table B – continued

Vector numbers of the inter-city indexes of price differentials of consumer goods and services

	Ottawa, Ontario	Toronto, Ontario	Winnipeg, Manitoba	Regina, Saskatchewan	Edmonton, Alberta	Vancouver, British Columbia
All-Items	(v15939981)	(v15940009)	(v15940037)	(v15940065)	(v15940093)	(v15940121)
Food	(v15939982)	(v15940010)	(v15940038)	(v15940066)	(v15940094)	(v15940122)
Food purchased from stores	(v15939983)	(v15940011)	(v15940039)	(v15940067)	(v15940095)	(v15940123)
Meat, poultry and fish	(v15939984)	(v15940012)	(v15940040)	(v15940068)	(v15940096)	(v15940124)
Dairy products and eggs	(v15939985)	(v15940013)	(v15940041)	(v15940069)	(v15940097)	(v15940125)
Bakery and other cereal products	(v15939986)	(v15940014)	(v15940042)	(v15940070)	(v15940098)	(v15940126)
Fruit and vegetables	(v15939987)	(v15940015)	(v15940043)	(v15940071)	(v15940099)	(v15940127)
Other food purchased from stores	(v15939988)	(v15940016)	(v15940044)	(v15940072)	(v15940100)	(v15940128)
Food purchased from restaurants	(v15939989)	(v15940017)	(v15940045)	(v15940073)	(v15940101)	(v15940129)
Shelter	(v15939990)	(v15940018)	(v15940046)	(v15940074)	(v15940102)	(v15940130)
Rented accommodation	(v21580964)	(v21580967)	(v21580970)	(v21580973)	(v21580976)	(v21580979)
Owned accommodation	(v21580965)	(v21580968)	(v21580971)	(v21580974)	(v21580977)	(v21580980)
Water, fuel and electricity	(v21580966)	(v21580969)	(v21580972)	(v21580975)	(v21580978)	(v21580981)
Household operations, furnishings and equipment	(v15939991)	(v15940019)	(v15940047)	(v15940075)	(v15940103)	(v15940131)
Household operations	(v15939992)	(v15940020)	(v15940048)	(v15940076)	(v15940104)	(v15940132)
Household furnishings and equipment	(v15939993)	(v15940021)	(v15940049)	(v15940077)	(v15940105)	(v15940133)
Clothing and footwear	(v15939994)	(v15940022)	(v15940050)	(v15940078)	(v15940106)	(v15940134)
Transportation	(v15939995)	(v15940023)	(v15940051)	(v15940079)	(v15940107)	(v15940135)
Private transportation	(v15939996)	(v15940024)	(v15940052)	(v15940080)	(v15940108)	(v15940136)
Purchase of passenger vehicles	(v15939997)	(v15940025)	(v15940053)	(v15940081)	(v15940109)	(v15940137)
Gasoline	(v15939998)	(v15940026)	(v15940054)	(v15940082)	(v15940110)	(v15940138)
Other private transportation	(v15939999)	(v15940027)	(v15940055)	(v15940083)	(v15940111)	(v15940139)
Public transportation	(v15940000)	(v15940028)	(v15940056)	(v15940084)	(v15940112)	(v15940140)
Health and personal care	(v15940001)	(v15940029)	(v15940057)	(v15940085)	(v15940113)	(v15940141)
Health care	(v15940002)	(v15940030)	(v15940058)	(v15940086)	(v15940114)	(v15940142)
Personal care	(v43975186)	(v43975167)	(v43975168)	(v43975169)	(v43975170)	(v43975171)
Recreation, education and reading	(v15940005)	(v15940033)	(v15940061)	(v15940089)	(v15940117)	(v15940145)
Recreation	(v43975177)	(v43975178)	(v43975179)	(v43975180)	(v43975181)	(v43975182)
Education and reading	(v43975188)	(v43975189)	(v43975190)	(v43975191)	(v43975192)	(v43975193)
Alcoholic beverages and tobacco products	(v15940006)	(v15940034)	(v15940062)	(v15940090)	(v15940118)	(v15940146)
Alcoholic beverages	(v15940007)	(v15940035)	(v15940063)	(v15940091)	(v15940119)	(v15940147)
Tobacco products and smokers' supplies	(v15940008)	(v15940036)	(v15940064)	(v15940092)	(v15940120)	(v15940148)

This is Exhibit "C" referred to in the
Affidavit of Philip Cross
sworn before me, this 20th day of July, 2018.

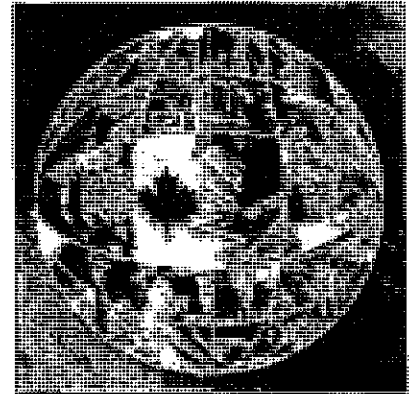


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Standard table symbols

The following symbols are used in Statistics Canada publications:

- not available for any reference period
- .. not available for a specific reference period
- ... not applicable
- 0 true zero or a value rounded to zero
- 0^a value rounded to 0 (zero) where there is a meaningful distinction between true zero and the value that was rounded
- ^P preliminary
- ^r revised
- x suppressed to meet the confidentiality requirements of the *Statistics Act*
- ^E use with caution
- ^F too unreliable to be published
- * significantly different from reference category ($p < 0.05$)

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Preface

This *Canadian Consumer Price Index (CPI) Reference Paper* provides an overview of the Canadian CPI. It is intended for a varied audience; ranging from users interested in general information to those requiring more technical or theoretical details. As such, it explains all the important aspects of the Canadian CPI: uses and interpretations, scope, classifications, sample strategy, price collection, index calculation, quality change, weights, basket updates, reliability and uncertainty, special cases and treatments and history.

The paper was written by Radu Chiru, Ning Huang, Mathieu Lequain, Phillip Smith and Amanda Wright of the Consumer Prices Division of Statistics Canada. Richard Evans provided key assistance in the preparation of this document. Appreciation also goes to Martin Beaulieu, Andrée Girard, Olfa Khazri, Michèle Lanoue, Gerry O'Donnell, Marc Prud'homme, Yannick Rancourt, Faouzi Tarkhani and Clément Yélou for their contributions and to the members of Statistics Canada's Price Measurement Advisory Committee for their comments.

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Reader's Guide

This volume explains the conceptual, structural and methodological basis of the Canadian Consumer Price Index (CPI). It should be regarded as the successor to the book *The Consumer Price Index Reference Paper*, published in 1995.¹ Much has happened since that earlier paper was released and fresh documentation is now required. Most recently, the statistical quality of the CPI has been greatly enhanced as the result of a multi-year project launched in 2010, aimed at improving the index.

The material in this reference paper is fairly technical and may not be of interest to all users of the CPI. For some purposes, the alternative document *Your Guide to the Consumer Price Index*² may be a more useful source of information. That paper provides a brief and straightforward explanation of: (i) the CPI itself and how it relates to Canadian consumers; (ii) how the relative importance of different goods and services is determined for purposes of the index; (iii) the means by which prices are collected, compiled and adjusted, when necessary, for changes in the quality of goods and services; (iv) the index reference period, which is currently 2002=100.0; (v) the mathematical formulas for calculating percentage changes; (vi) the ways in which the CPI is sometimes used to adjust or "index" payments of various kinds; and (vii) how the CPI can be used to compare dollar values over time.

The remainder of this Reference Paper provides a thorough explanation of the concepts and methodology underlying Canada's CPI. The first chapter provides an overview and summary of the entire document.

1. Statistics Canada (1995).
2. Statistics Canada (1996).

Chapter 1 Introduction to the Canadian Consumer Price Index

- 1.1 The Canadian Consumer Price Index (CPI) is an indicator of the change in consumer prices. It measures price change by comparing through time the cost of a fixed-basket of consumer goods and services. Since the basket contains products of unchanging or equivalent quantity and quality, the index reflects only “pure” price change.

Availability and Uses

- 1.2 The CPI is released every month, about three weeks after the price observation period. A variety of CPI time series statistics for different product classes and geographical areas are available without charge on the Statistics Canada Internet site by means of CANSIM, Statistics Canada's on-line database, and via analytical publications.³
- 1.3 The index is used for an assortment of different purposes by various users. One of its most important uses is by governments, businesses and individuals to adjust selected contractual or legislated payments in line with inflation.⁴ By linking a stream of future payments to the CPI, it is possible to ensure the purchasing power represented by those payments is unaffected by the average change in consumer prices that may occur.
- 1.4 For more than two decades the Bank of Canada has based its monetary policy approach on inflation targeting, aiming to hold the rate of inflation, as measured by the CPI, between one and three per cent. In addition, the federal and provincial finance ministries frame their fiscal policies in terms of the income and expenditure accounts which, in turn, are reliant for their calculation on the CPI, among other statistical data sources. The CPI is regularly and widely reported by the news media and is the standard measure of inflation used by most Canadians.
- 1.5 The CPI itself compares prices in the current month, *t*, to prices in the index reference period, where the index is set arbitrarily to 100. For many purposes it is also useful to calculate month-over-month changes or 12-month changes, comparing prices in the current month to those in the immediately previous month or the same month one year earlier. Contributions to percentage change are also useful because they provide the influence of changes in sub-aggregate indices to changes in aggregate indices. In Statistics Canada's CPI publications, all indices and percentage changes are rounded to one decimal place.
- 1.6 For more on the availability and uses of the Canadian CPI, and on the interpretation of percentage changes and contributions to change in the CPI and the effect of statistical rounding on the index, refer to Chapter 2.

Scope of the Index

- 1.7 The CPI does not purport to measure the average movement of prices for all products bought and sold in Canada. Rather, its scope is limited to the prices of goods and services purchased by households in Canada. Moreover, the purchases of most, but not all households are in scope. The few exceptions include soldiers on military bases, people living on First Nations reserves and institutionalized persons, such as prison inmates and persons in long-term care facilities. In addition, households living in the rural areas of the three northern territories, outside Yellowknife, Whitehorse and Iqaluit, are deemed out of scope due to the difficulty and cost of monitoring prices in those remote regions.
- 1.8 Many products are out of scope for the CPI. For example, the prices of raw materials and other intermediate products purchased by manufacturers as inputs to their production processes are not included. Nor are the prices paid by governments for office equipment, consulting services and other products. Likewise the prices paid by businesses in other countries for exported Canadian goods and services are excluded. The CPI is all about the prices paid by households for consumer goods and services.

3. The Statistics Canada Internet site is www.statcan.gc.ca. The main Consumer Price Index publication is The Consumer Price Index, Catalogue No. 62-001-X, Monthly.

4. Among the many such indexed payments are those from the Canada and Quebec Pension Plans, Old Age Security and the Guaranteed Income Supplement; real return federal and provincial bonds and a variety of private financial arrangements such as some spousal and child support allowances, negotiated wage agreements and longer-term rental contracts.

The Canadian Consumer Price Index Reference Paper

- 1.9 Financial products such as equities and bonds are not included either, even though they might be purchased by consumers, since they are considered financial investments rather than consumer goods or services. Nevertheless the prices of the services that facilitate the purchase of such financial assets, such as banking and brokerage charges, are in scope. Illegal products, such as non-prescription narcotic drugs, and a few legal products such as gambling services are also excluded, because of the practical or conceptual difficulties they present.
- 1.10 The CPI aims to measure average transaction prices throughout the entire reference month. Prices reflected in the index are those actually paid by Canadians to purchase consumer goods and services, including the impact of any discounts or sales and excise taxes that may apply, such as the Goods and Services Tax. Accordingly when tax rules or rates change, the index is affected. The index does not include personal income taxes because these are not associated with the purchase of any particular product.
- 1.11 Chapter 3 provides a more thorough explanation of the CPI scope.

Classifications

- 1.12 The CPI covers a wide range of goods and services and a large geographical area. It does this by using classifications of products and geography. The product classification contains 695 product classes that together account for all products in scope for the CPI calculation. The geographical classification has 19 area strata representing the ten provinces, with four in Ontario, three in Quebec, two in British Columbia and one in each of the others, plus the Primary Census Agglomeration (PCAs) of Yellowknife, Whitehorse and Iqaluit. The CPI is built up from price indices for elementary aggregates, which are pairings of product and geography classes from these two classifications. For more information about the product and geography classifications and the associated elementary aggregates, see Chapter 4 and Appendix B.

Sample Strategy

- 1.13 Households engage in millions of transactions every month. Most of the prices involved in these transactions are in scope for the CPI. However, since it is not practical to observe the prices in all transactions, a statistical sampling approach is required. That approach involves a general sampling strategy for most prices combined with more specialized strategies for some specific product classes.
- 1.14 General sampling for the CPI occurs in three stages. In the first stage, a set of representative geographical collection areas is selected, first in terms of census sub-divisions (which are essentially municipalities) and then in terms of specific census tracts within the chosen sub-divisions (which are like neighbourhoods within municipalities). The sampling of census sub-divisions (CSDs) and tracts is done with population counts serving as weights.
- 1.15 The second stage is the selection of representative outlets from the CPI outlet frame. The degree of "representativeness" of outlets is assessed using a variable such as annual sales revenue. In the third stage a set of representative products (RPs) from each of the product classes is chosen to characterize all the products in that class and to be collected in the outlets selected at the second stage. The product sample is not probabilistic because there is no comprehensive sampling frame for all consumer transactions.
- 1.16 At the outlet sampling stage, the goal is to identify sales by product class by type of outlet (large retail stores, small retail stores, Internet sales, and so on), in order to identify which types of outlets account for the largest proportion of consumer purchases. That done, specific outlets can be selected in which to observe the prices of specific RPs. For a few product classes, where national or provincial pricing predominates, prices are collected via the Internet or through other means not involving direct collection in stores. However, in most instances prices are obtained locally in retail stores.

- 1.17 From each product class a small sample of RPs is chosen to characterize all the products in that class. Ideally the selection of RPs would be chosen probabilistically, with associated weights reflecting the relative importance of each product within the class. This would require a products “frame” – a comprehensive and up-to-date list of products with associated expenditure values – from which to select and weight the sample of collected prices. Frame information of this kind is available for a few selected product classes, but is presently unavailable for most product classes. For this reason, the selection of RPs for most product classes is done judgmentally, with emphasis on products that are known to be among the most popular with consumers.
- 1.18 For a few product classes, no sampling is required because it is possible to observe all transaction prices for the entire product class. This is substantially the case for passports, passenger vehicle permits and driver’s licenses. Cut-off sampling is used in some instances. The profiles method is used where the market normally prices product bundles instead of individual products and the bestsellers method is used for products where prices are based on the intangible characteristics, such as novelty of the content.
- 1.19 The sample size is limited by budgetary considerations. Given a particular sample size, the optimal allocation of sample across product/outlet pairs is a challenge. Key factors entering into decisions about this allocation are the volatility of the product price, the basket weight for the product class in question and the associated collection cost. The more volatile a product’s price, the greater its basket weight and the lower the marginal cost of price quote collection, the larger will be the price sample for that product category.
- 1.20 Chapter 5 provides more details on the sampling strategy for the CPI.

Price Collection

- 1.21 Most of the price quotes used to calculate the CPI are collected in the sampled outlets in various locations across the country. The collection is done by employees, known as interviewers, supervised by the Statistics Canada Regional Offices. Each month Statistics Canada headquarters sends a sample request to the interviewers, who collect the requested price quotes, record them in Computer-Assisted Personal Interview (CAPI) devices and transmit the data to headquarters in Ottawa for further processing.
- 1.22 Back at headquarters the observed prices are reviewed for conformity with the sample request, checked for unusual or ‘outlier’ values and corrected if necessary, adjusted for quality changes where appropriate (as explained in Chapter 7) and generally made ready for the CPI calculation.
- 1.23 For more about the price sample collection and processing procedures, see Chapters 5 and 7.

Calculation of the Consumer Price Index

- 1.24 The calculation of the CPI is done in two steps. The first, termed the lower level calculation, involves calculating price relatives, using a matched-model approach, and then averaging them together to obtain elementary price indices. The second step, referred to as the upper level calculation, involves the estimation of aggregate price indices as weighted averages of the elementary price indices.
- 1.25 The lower level calculations are mostly done using an implicitly weighted geometric mean equation, referred to as the Jevons formula. There are some exceptional cases, however, where alternative formulas are used. Some of the more significant among these special cases are the elementary product classes for mortgage interest charges (explained in Chapter 10), dwelling rents, property and automobile insurance, banking services and post-secondary education services. (see Chapter 6 and Appendix B).
- 1.26 The upper level calculations are done using a fixed-basket Lowe formula, which applies fixed quantity weights to the elementary price indices in order to aggregate them. The basket weights determine the relative importance of different product classes and geographical regions in the All-items CPI.

- 1.27 The structure and methodology of the CPI are technically complex and the summary just given omits many details. A fuller description is provided in Chapter 6. In addition, the mathematical formulas for the aggregation of the CPI are listed in Appendix A.

Quality Change and Adjustment

- 1.28 The CPI aims to measure 'pure' price change and it does this via the 'matched-model' approach to sampling. However, what happens when a given sampled product is no longer carried by a particular outlet, or when the outlet in which the product's price is collected has closed its doors? In this kind of situation a substitute product or a replacement outlet must be chosen and price change in the affected month must be adjusted for any quality difference that may exist between the new and the old products.
- 1.29 Adjustments for quality change are often fraught with difficulty and pose a demanding challenge for index compilers. A variety of different methods are employed depending on the circumstances.
- 1.30 For some products there is no significant possibility of quality change and for these, no adjustments are needed. Examples include products like electricity, natural gas, motor gasoline and refined sugar and flour. For some packaged products, the quality is unlikely to change significantly but the quantity in the container may increase or decrease. When this happens, the observed price change is adjusted to standardize for quantity. Examples of this standardization treatment include cereals, laundry detergents and candy bars. The more difficult cases of quality adjustment involve such products as automobiles, high-tech goods, items of clothing and many types of services. These products involve more substantial changes in the inherent quality of the product over time as a result of technological innovation, changes in fashion or other factors.
- 1.31 A thorough discussion of how quality change is dealt with in the CPI is provided in Chapter 7. As explained there, a variety of methods are used for the various product classes. Among these are implicit techniques, such as direct price comparison, overlap pricing, overall mean imputation, and link-to-show-no-change. Where implicit adjustment is not feasible, various explicit quality adjustment methods, including hedonic modeling, the option cost method or expert judgment are used. The table in Appendix B includes a column showing the quality adjustment method used for each published product class.

Weights and Basket Updates

- 1.32 The product and geographical classifications, discussed in Chapter 4, are important to many aspects of the CPI. They offer users of the index considerable detail that is helpful in analyzing inflationary trends. They provide a foundation for the price sampling strategy, as discussed in Chapter 5. In addition, they are central to the "fixed basket" concept that underlies the CPI upper level calculation.
- 1.33 To grasp the fixed basket concept consider the following story. A person enters a store, fills a shopping basket with various products and pays for these items at the cash register. The following month the person goes back to that store and buys the exact same quantities of the same goods and services. In other words, the person buys a "fixed basket" of goods and services. The cost of the products bought in the second month divided by the cost of the identical items purchased in the first month is an aggregate price relative. Defining a price index starting value of 100 in the first month, the price index will change in the second month to 100 multiplied by the aggregate price relative just computed. This is what is meant by a fixed basket concept. The CPI is essentially a fixed basket index of this type, except that the CPI "basket" contains not just a few specific products, but rather all the in-scope goods and services purchased by households in Canada.
- 1.34 Each of the elementary classes has a fixed quantity weight that is used as part of the CPI aggregation process – that is, to combine the elementary price indices into the All-items CPI. However, data on consumer expenditures is much easier to obtain than data on quantities purchased. Since the Lowe formula can be expressed in terms of quantities, expenditures or expenditure shares, the aggregate expenditures for each elementary class are used. These expenditures are a product of the unobserved quantities and the observed prices. In order to maintain the fixed quantity nature of the index, the expenditures used in the calculation have to be price-updated according to observed price changes.

- 1.35 The CPI expenditure weights are estimated primarily from data taken from Statistics Canada's Survey of Household Spending (SHS), which is conducted annually and yields statistical estimates of household expenditure by product class and region, about eleven months after the reference year. Of course, household expenditure patterns are in constant flux in response to demographic change, the economic cycle, shifting relative prices and other factors. The current practice is to measure the household expenditure weights comprehensively for a 12-month period, and to refresh these estimates every two years. When the weights are recalculated in this way, the process is referred to as a "basket update".
- 1.36 The CPI is a sequence of fixed basket indices, each with its own unique classification structures and basket weights, which have been chain linked together. At present the basket updates occur every two years or so, but in the past they were carried out less frequently. Appendix C provides a detailed chronology of the various baskets implemented since the CPI began in 1913. The 100-year time series for the CPI, which is available on CANSIM, is really a chain-linked series of many CPIs.
- 1.37 It is important to distinguish between the weight reference period, the index reference period and the price reference period. The first of these is the period from which the CPI expenditure weights are taken. The index reference period is the period in which the index is arbitrarily scaled to equal 100. Currently, for the Canadian CPI this is 2002. The choice of index reference period has no effect on percentage changes in the index. Users can easily change the index reference period by simply rescaling the index accordingly. Statistics Canada also maintains a few alternative CPI series on CANSIM with different index reference periods, for the convenience of users. Finally, the price reference period is the period that prices are being compared with. It appears in the denominator of price ratios and is typically designated as period 0.
- 1.38 Chapter 4 provides a more thorough discussion of the CPI classification systems, while Chapter 8 focuses on the weights and basket updates as well as the index base period.

Reliability and Uncertainty

- 1.39 Statistical error is, of course, the difference between the unknown "true" value and the measured value. The CPI is a sample-based statistic and like all such statistics, is subject to several types of error. The error can occur either during the lower level calculations or as part of the upper level calculations.
- 1.40 Statistical bias arises when the expected average result over many samples differs from the "true" value. In the case of the CPI, bias can occur for several reasons. When statisticians need to replace one product with another and they make an associated quality adjustment, statistical bias might be introduced if the method for doing so had a persistent tendency either to underestimate or to overestimate the true extent of quality change. Bias might also be inherent in some editing procedures, although of course Statistics Canada strives to avoid any such bias.
- 1.41 Sources of potential bias are associated with new product introductions and outlet substitutions. New product introduction bias occurs when innovative products appear on the market and are not reflected in the CPI product sample in a timely manner. A number of steps are taken to guard against this bias, but it is difficult to avoid entirely, especially given the CPI's matched-model pricing methodology. Outlet substitution bias occurs when new stores enter the market offering lower prices and thereby inducing consumers to switch outlets. Again this is a difficult source of potential bias to avoid completely, but efforts are made to refresh the outlet sample periodically to minimize this kind of bias.
- 1.42 Sampling variance is an error characteristic that is very different from statistical bias. It refers to the extent of dispersion of estimates, over many samples, around the "true" value. In a statistical context, larger samples will yield lower variance. Efficient statistical estimation means minimal variance given the sample size. It is quite possible to have a zero bias and a positive variance. However, the only way to achieve a zero sampling variance is to measure the entire target population which, in the case of the CPI, is not possible.

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- 1.43** Most Statistics Canada surveys report numerical estimates of the size of the sampling variance. These provide users of the statistics with an indication of statistical reliability. Thus, when a particular statistical estimate is released, the variance might be used to calculate what the "true" value is expected to be within certain specific numerical boundaries 19 times out of 20. As explained in Chapter 5, however, this is not possible for the CPI because, since product sampling is almost always done judgmentally rather than randomly, sampling variances cannot be calculated.
- 1.44** The CPI may also be subject to non-sampling errors of various kinds. Clerical and transcription errors fall into this category, although there are a number of checks and balances in the CPI monthly production process that aim to detect and correct any such errors. Another source of non-sampling error is errors and omissions in the business frame (list) that is used in selecting the sample of outlets for price collection. Again, efforts are made to minimize such errors, but it is nearly impossible to keep the list of retail businesses constantly up to date and without error.
- 1.45** Another notable source of potential error in the CPI applies to the elementary aggregates that are estimated by imputation rather than by direct price measurement. There are several residual classes in the CPI product classification, typically containing a wide variety of distinct goods and services, yet having comparatively small basket weights. Price change for these elementary aggregates is estimated indirectly, by imputation, as a cost saving measure. The expense of direct price measurement in these cases would be unjustified given their small basket weights and heterogeneous character.
- 1.46** Prices change with the passage of time and as they do, consumers tend to substitute goods and services that have become relatively cheaper for ones that have become relatively more expensive. For example, if pork prices have risen less rapidly than beef prices, there is an incentive for consumers to buy more pork and less beef. This phenomenon tends to make the basket weights out of date as time goes by. It causes a problem called substitution bias that influences the CPI upper level calculation.
- 1.47** Ideally the basket weights would reflect purchasing patterns of consumers in both periods for which prices are being compared. In other words, if the index is comparing two particular months, the weights would reflect the purchasing patterns of consumers in those two months. This is not presently feasible. In fact, the weights come not from the two months where prices are compared, but from some period (typically a year) prior to the price reference period (0) and price observation period (t). This is the main source of substitution bias in the CPI. Normally the closer is the time period from which the weights are calculated to the two months being compared, the smaller will be this source of bias. When, in 2013, Statistics Canada increased the frequency with which the basket weights are updated from once every four years to once every two years, this reduced substitution bias.
- 1.48** In addition, the upper level calculations are affected by statistical error in the SHS, which is used to estimate the basket weights.
- 1.49** Chapter 9 gives a much fuller discussion of the CPI's reliability, error properties and statistical bias.

Treatment of Owned Accommodation

- 1.50 Owned accommodation is an important component of the CPI, with a large basket weight, which poses especially difficult conceptual and methodological issues. There is no international consensus on how best to define and measure the price of owned accommodation and countries have adopted a variety of approaches. This makes international comparisons of inflation challenging.
- 1.51 The difficulty in this case stems from the fact that owned accommodation can, for some purposes, be thought of as a capital good rather than consumption good. Like all capital goods, it provides a stream of services over a lengthy period of time. Statistics Canada's approach is to measure the impact of price changes on the costs incurred by homeowners while they own a home. These costs include mortgage interest, replacement cost (depreciation), property taxes, home and mortgage insurance, maintenance and repairs, and other expenses. The first three of these cost categories account for three quarters of the total owned accommodation basket weight.
- 1.52 The owned accommodation price index is explained in Chapter 10.

Seasonal Products

- 1.53 Some of the products whose prices are measured by the CPI are highly seasonal, both in terms of the quantities purchased each month by consumers and in terms of the prices retailers charge at different times during the year. This is true for fresh fruit and vegetables, some kinds of clothing and certain recreational services, for example.
- 1.54 The basket weights applicable to seasonal products are, just as for non-seasonal products, estimated using annual household expenditure statistics. They are, therefore, not seasonal even though the monthly purchases by consumers can vary considerably through the year. Indeed, for some products in some months consumer purchases are zero – Christmas trees in July, for example. Statistics Canada deals with such cases by imputing the price movement based on that of similar in-season products. The fact that actual purchases of seasonal products in a given month can be very different from the purchases that are reflected in the yearly basket weights is another source of statistical bias in the CPI. This bias is likely to average near zero for the year as a whole, but can be significant in month-over-month comparisons. Bias is discussed in Chapter 9.
- 1.55 A related matter is the fact that monthly changes can be substantially influenced by seasonal factors. For any given month-over-month percentage change, users of the index often find it advantageous to distinguish between the part that is attributable to normal seasonal causes and the remaining non-seasonal part. The seasonal part is predictable and, therefore, less interesting. The non-seasonal part reflects the underlying trend in prices as well as any special temporary factors, and is more noteworthy.
- 1.56 Seasonally adjusted indices reflect price change after seasonal fluctuations are removed. Statistics Canada provides seasonally adjusted versions for the All-items CPI, the eight major aggregates and four of the special aggregates. These indices are adjusted independently, which implies they are not consistent in aggregation, and these indices are also subject to revision over time, unlike the unadjusted indices which are not revised.
- 1.57 The influence of seasonality on the CPI is discussed in Chapter 10.

History of the Canadian Consumer Price Index

- 1.58 Canada's CPI has a century-long history. Not surprisingly, the index has been improved greatly over that lengthy period. The interval between basket changes was reduced in several steps, from 13 years the first time the basket was updated in 1926 to just 2 years currently. The estimates of the basket weights were much enhanced by the introduction of the Family Expenditure Survey for the year 1938. The scope of the index has been broadened several times, in a number of ways. The sample size has risen, fallen and risen again, reflecting changing budgetary priorities. In addition, while the index was often revised during its first few decades, starting with the postwar period, the policy has been to eschew statistical revisions of the unadjusted statistics, as a convenience to users.
- 1.59 For more on the history of Canada's CPI, see Chapter 11 and Appendix C.

Chapter 2 Availability and Uses

Availability of Information

- 2.1 The All-items Consumer Price Index (CPI), various aggregate indices as well as special aggregate indices are produced and published each month for Canada, the provinces, Whitehorse and Yellowknife. Additionally, the All-items CPI and the Shelter price index are produced and published for sixteen cities.⁵ The All-items CPI is the only index published for Iqaluit.
- 2.2 The monthly CPI series for the eight major aggregates at the Canada level are also available seasonally adjusted. Each year with the release of the December CPI in January, annual average indices are produced for all of the published monthly indices. Annual average indices are calculated as the unweighted arithmetic average of the 12 monthly indices within the year. The monthly and annual average indices for the All-items CPI for Canada are available in chain-linked series back to 1914. Indices for other geographies and/or aggregates are available starting from various periods as they entered the CPI statistical program.
- 2.3 In addition to the monthly and annual CPI series, average retail prices (not price indices) for food and other selected items for Canada and average retail gasoline and fuel oil prices for eighteen cities⁶ are estimated and published monthly.
- 2.4 Inter-city indices of price differentials of consumer goods and services are produced and published once a year for eleven cities.⁷
- 2.5 All monthly CPI statistics are available at 8:30 am EST on the day of the release. The release is typically on the third Friday of the month following the price observation period. For example, the CPI for price observation period January 2014 was released on February 21st 2014.
- 2.6 At present, there are three main vehicles for the release of the CPI data:
- 2.6.1 The Canadian Socio-Economic Information Management System (CANSIM)⁸
 - 2.6.2 *The Daily*⁹
 - 2.6.3 The Consumer Price Index publication¹⁰
- 2.7 CANSIM is Statistics Canada's key socioeconomic database in which users can easily access a large range of statistics free of charge. CANSIM contains many more CPI series than either *The Daily* or the CPI publication.
- 2.8 *The Daily* is Statistics Canada's main release bulletin and the Agency's first line of communication with the media and the public. *The Daily* provides an overview of the monthly CPI statistics while focusing on the indices which had the most notable upward or downward contributions to the year-over-year (12-month) and monthly percentage changes in the CPI.
- 2.9 The CPI publication includes the same text and graphs contained in *The Daily* as well as a lengthy list of statistical tables and information on the quality, concepts and methodology of the CPI.
- 2.10 Once published, the official CPI statistics are not revised. Seasonally adjusted price indices are the only CPI series which are revised. Those data are revised one month after release and then each year with the January CPI, the past 36 months of seasonally adjusted data are revised.

5. The sixteen cities are: St. John's, Charlottetown-Summerside, Halifax, Saint John, Québec, Montréal, Ottawa, Toronto, Thunder Bay, Winnipeg, Regina, Saskatoon, Edmonton, Calgary, Vancouver and Victoria.

6. The eighteen cities include the previous sixteen cities plus Whitehorse and Yellowknife.

7. The eleven cities are: St. John's, Charlottetown-Summerside, Halifax, Saint John, Montréal, Ottawa, Toronto, Winnipeg, Regina, Edmonton and Vancouver.

8. Statistics Canada, CANSIM Tables 326-0009, 326-0012, 326-0015, 326-0020 and 326-0021.

9. Statistics Canada, *The Daily*, Catalogue No. 11-001E.

10. Statistics Canada, The Consumer Price Index, Catalogue No. 62-001-XWE, Monthly.

Interpreting Percentage Changes

- 2.11 The CPI is a composite price index, which compares prices for consumer products in various price observation periods (which can be months or years), to prices in the index base period (also referred to as the index reference period). The CPI is arbitrarily set to equal 100 in the index base period. Therefore, all index values express price change in percentage terms in comparison to the index base period. For example, if the index is 123.4, that means prices have increased 23.4% since the base period. The current index base period of the CPI is 2002.
- 2.12 The CPI base period can easily be changed by multiplying all CPI series by a constant conversion factor equal to 100, divided by the average index for another specific time period. This is known as rebasng an index. Period to period price change will not be impacted by rebasing an index.¹¹
- 2.13 Other common time comparisons that are made with the CPI include:
- 2.13.1 month-over-month percentage changes which compare price indices in a given month to price indices in the preceding month (e.g. November compared to October).
 - 2.13.2 year-over-year (12-month) percentage changes, which compare price indices in a given month to price indices in the same month of the preceding year (e.g. November 2012 compared to November 2011).
 - 2.13.3 annual average percentage changes, which compare two consecutive annual average price indices.
- 2.14 Special aggregate indices are calculated and published monthly and on an annual basis for Canada, the provinces, Whitehorse and Yellowknife.
- 2.15 Special aggregates are different combinations of the elementary aggregate indices. They often exclude certain product classes, in order to provide users with supplementary information on how consumer prices are changing. These indices provide alternative measures of consumer price inflation.
- 2.16 When a special aggregate index excludes certain product classes, their corresponding weights are removed from the total. As a result, the shares of the remaining goods and services increase in relative importance.

Contributions to Price Change

- 2.17 A fixed-basket composite price index for a given aggregate $I_A^{0,t}$ is made up of price indices $I_i^{0,t}$ and weights w_i^0 for the sub-aggregates that are contained in the given aggregate.¹² Therefore it is possible to explain a given aggregate's price change (month-over-month or 12-month) in terms of the influence exerted by its particular sub-aggregates. Analyses of this kind are referred to as contributions to percentage change. Contributions explain how many percentage points of the aggregate percentage change come from a given sub-aggregate. For example, the gasoline index (a sub-aggregate) contributed 0.5 percentage points to the 1.0 percent change in the All-items CPI.
- 2.18 The influence exerted by a given sub-aggregate on a composite price change depends on both its price change and on its importance in the basket, as measured by its weight. Calculating contributions to composite price change across chained baskets requires additional steps.¹³

11. However published percent changes may differ due to rounding.

12. The computation of fixed-basket composite price indices is discussed in paragraphs 6.25-6.36.

13. This is because chained indices are computed using several fixed-baskets; hence there can be no single expression of the importance (weight) of each sub-aggregate. The method for calculating contributions to index percentage change across baskets is discussed in paragraphs 8.22 to 8.24.

2.19 Any composite price index that relates to one fixed basket can be written as a weighted arithmetic average of the corresponding indices for all its constituent sub-aggregates. In other words, the aggregate index $I_A^{0:t}$ that expresses the change in prices between period 0 and t is a weighted mean of all the indices $I_i^{0:t}$ expressing the change in prices during the same period for all its constituting sub-aggregates.

$$I_A^{0:t} = \sum_{i=1}^n I_i^{0:t} \times w_i^{0b} \quad (2.1)$$

Where:

$$w_i^{0b} \equiv \frac{p_i^0 q_i^b}{\sum_{i=1}^n p_i^0 q_i^b} \text{ is the hybrid expenditure share,}^{14}$$

p_i^0 is the price for sub-aggregate i in period 0;

q_i^b is the quantity for sub-aggregate i in period b , and;

n is the number of sub-aggregates in the aggregate A .

2.20 Using (2.1), it is possible to decompose the monthly price change of the aggregate index between $t-1$ and t $\left(\frac{I_A^{0:t}}{I_A^{0:t-1}} - 1\right)$ in terms of the monthly change of its sub-aggregates.¹⁵ By construction, the weighted sum of all the sub-aggregates' monthly price changes will be equal to the monthly price change of the aggregate.

$$\left(\frac{I_A^{0:t}}{I_A^{0:t-1}} - 1\right) = \frac{I_A^{0:t} - I_A^{0:t-1}}{I_A^{0:t-1}} = \frac{\sum_{i=1}^n (I_i^{0:t} - I_i^{0:t-1}) w_i^0}{I_A^{0:t-1}} \quad (2.2)$$

Where:

$$\frac{(I_i^{0:t} - I_i^{0:t-1}) w_i^0}{I_A^{0:t-1}} \text{ represents the contribution of each sub-aggregate } i \text{ to the aggregate } A.$$

2.21 The share of the basket weight w_i^{0b} of the sub-aggregate index i , together with the size and direction of its price change will determine the size and direction of its contribution to the percentage change in the aggregate index A . An increase/decrease in a sub-aggregate index will most often translate into an upward/downward contribution to the aggregate index percentage change.¹⁶ The sum of the contributions of all sub-aggregates of the All-items CPI is equal to its overall rate of change (monthly or 12-month).

14. Hybrid expenditure shares are discussed in paragraphs 6.27 to 6.31.

15. The same exercise can be carried out when analysing the 12-month percent change.

16. The direction of a sub-aggregate's contribution to aggregate index percentage change may be different than the percent change of the sub-aggregate when the period of comparison spans two baskets. The method for calculating contributions to index percentage change across baskets is discussed in paragraphs 8.22 to 8.24.

- 2.22 The difference in contributions gives the impact of a sub-aggregate on the difference in the percentage change of its aggregate index. This is commonly referred to as acceleration or deceleration and is obtained by subtracting the contribution in period $t-1$ from the contribution in period t . For example, assuming that the gasoline index contributed 0.5 percentage points in period $t-1$ to the 1.0 percent change in the All-items CPI and in period t contributed 0.7 percentage points to the 1.4 percent change in the All-items CPI, it can be interpreted that the gasoline index contributed 0.2 percentage points ($0.7 - 0.5$) to the 0.4 percentage point acceleration ($1.4 - 1.0$) of the All-items CPI between periods $t-1$ and t .
- 2.23 The analysis provided by Statistics Canada in the various release items for the CPI is based on an understanding of the contributions of sub-aggregate indices to the monthly or 12-month percentage change in the All-items CPI or another aggregate index.

Rounding in the Consumer Price Index

- 2.24 During the different steps of their construction all CPI indices are calculated to several decimal places. However, consistent with international practice, indices are rounded to one decimal place when they are published. Percentage changes (monthly, 12-month and annual average) in Statistics Canada publications are always calculated with the published rounded indices. They are also rounded to one decimal place. That way, users can always replicate the published percentage changes.
- 2.25 As a result of these two stages of rounding, a small amount of accuracy in percentage changes may be lost. Therefore, small fluctuations (± 0.1) in the percentage changes of indices should be interpreted with discretion.
- 2.26 Another side effect of rounding indices is that at times there could appear to be inconsistencies between the percentage changes in aggregate indices and their sub-aggregate indices. For example, the rounded percentage change of an aggregate index may not be centered among the rounded percentage changes of its sub-aggregate indices.
- 2.27 The loss of precision due to rounding is amplified when indices are of small value. Therefore, rebasing an index, which generally results in smaller index values for the past, can reduce the precision of calculated percentage changes. For example, with an index base period of 1914=100, a 0.1 percent increase in the All-items CPI from 1914 to 1915 would translate to an index value of 100.100, rounded to 100.1. However, with an index base period of 2002=100, the rebased 1914 index value would be 6.0. The same 0.1 percent increase in the All-items CPI from 1914 to 1915 translates to an index value of 6.006, rounded to 6.0. Therefore, rounding indices reduces the precision for percentage changes for periods in the past. Loss of precision in historical figures should be considered when deciding to rebase an index.

Uses of the Consumer Price Index

- 2.28 The CPI, as a composite price index, is an official measure of consumer price change through time. It is of interest to governments, unions, business organizations, research institutions and very large segments of the general public. Undoubtedly, the CPI is one of the most widely-known, quoted and used statistical series in Canada. Its prominent profile, while indicative of wide acceptance, also poses problems because the CPI cannot serve all uses perfectly and equally well. Users are advised, therefore, to approach the CPI with discretion, especially when using it for purposes that lie outside of its main focus.

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2.29 The CPI is often used to adjust incomes, wages or other payments to maintain previous purchasing power in the face of changing consumer prices. In some cases, periodic changes to specific payments are made using a built-in adjustment factor, in which the CPI rate of change is applied either wholly or in part. This is currently the case, for example, for government payments resulting from such social programs as the Canada and Quebec Pension Plans, Old Age Security and the Guaranteed Income Supplement. Some labour-management contracts also contain cost-of-living adjustment clauses, by which wages and salaries are tied to the CPI in a variety of ways. Even more frequently, the CPI serves as a point of reference in wage and salary negotiations without being applied as a built-in adjustment factor. Many other financial arrangements make reference to the CPI in adjusting the terms of payment.¹⁷ Finally, it is likely that many Canadians monitor the CPI to judge how their incomes (or expenditures) are keeping pace with consumer price change.

2.30 As an adjustment factor, whether it is used automatically or as a point of reference, the CPI has come to affect most Canadians, and it plays an extremely important role in the economic and social affairs of the country. The CPI, for example, is a good indicator of changes in the purchasing power of the consumer dollar. However, the index does not dictate what the specific adjustments should be to wages and other forms of income. It is up to the contracting parties to determine the proportion of changes in purchasing power that should be compensated for. The following should be considered by those who use the CPI as an income adjustment factor.

2.30.1 The CPI is an indicator that relates, by definition, to a specified target population, may not reflect the experience of a particular group within this population. However, it is unlikely that the differences between the average change in consumer price indices for the target population and those for any other broad segment of the Canadian population would be large over the long run.¹⁸

2.30.2 The CPI, by construction, is not a Cost-of-living-Index (COLI) and while it may serve as a close approximation for one, it does not take into account some aspects or concepts which would typically be included in a COLI.¹⁹ For example, it does not include the effect of changes in the external environment, such as incidence of disease and natural disaster or crime levels, which may affect the demand for certain goods and services with little or no effect on prices. Additionally, as an asymmetrically weighted, fixed-basket index the CPI does not, in a timely manner, account for consumer substitutions among purchased products.²⁰

2.31 The CPI is often used as a general indicator of inflation in Canada. An analysis of the CPI, in conjunction with analyses of other statistical series, can reveal fundamental trends in the economy. The CPI therefore plays an important role in the formulation of policies and in economic forecasting. The comparison of current changes in the CPI to changes in the past, and to the behavior of similar indices in other countries, helps analysts to evaluate the effectiveness of many economic policy decisions. Although the CPI is often used as a general indicator of inflation, it is worth underlining some important limitations in this respect.

2.31.1 The CPI is not a comprehensive measure of price change at the final stage of economic transactions. This is because the index does not take into account some elements of the final use of goods and services in the country, such as the consumption of government services, capital formation or exports.

2.31.2 The mortgage interest cost index in the owned accommodation component of the CPI reflects not only current price changes, but also past changes by means of a moving weighted average of price changes over multi-year periods.²¹

17. A partial list includes: rental agreements, insurance coverage, private loans, spousal maintenance, child support allowances and Consumer Price Index-indexed bonds.

18. Taktek (1998) Chiru (2005).

19. For more information on the concepts of a Cost-of-living-index (COLI), see National Research Council (2002).

20. Substitution bias in the Consumer Price Index is discussed in paragraph 9.22.

21. Further explanation of the mortgage interest cost index can be found in paragraphs 10.13- 10.23.

- 2.32** The Implicit Price Index for domestic final expenditures in the Canadian System of National Accounts (CSNA), being free of the above limitations in addition to being calculated with a symmetrically weighted index formula, is a more comprehensive indicator of overall inflation. It is, however, released quarterly, two months after a given quarter, relates to non-market as well as market segments of the economy and relies on imputed prices for some important components, notably owner-occupied housing. It is also subject to revisions over several years as more statistical information becomes available.²²
- 2.33** The importance of the CPI as a general indicator of inflation has become more apparent since February 1991, when the Bank of Canada switched to an inflation targeting regime with the All-items CPI as its target indicator. While the CPI has always been a key statistical measure used by the Bank of Canada in determining its monetary policy, the adoption of an inflation targeting regime increased the attention given to the CPI as a general indicator of inflation.

22. For further information on the Chain Price Index used in the Canadian System of National Accounts, see Statistics Canada (2008).

Chapter 3 Scope of the Index

- 3.1 The scope of the Consumer Price Index (CPI) is defined to indicate what the CPI is intended to measure. Since there are many uses of the CPI, its scope has been defined to suit as many purposes as possible. However, the diverse uses of the CPI mean that it may not suit any one purpose perfectly and therefore awareness about the scope is necessary when using the CPI for a particular function.
- 3.2 The CPI indicates the average price change of a fixed basket of consumer products purchased by Canadian private households. Therefore, the scope consists of transactions, for the purpose of consumption, between households in Canada and establishments operating in Canada. Only those transactions for purposes of consumption are included in the CPI. Therefore, investment expenditures, that is, transactions made with the intention of acquiring some sort of future purchasing power for example, the purchase of stocks or bonds, are excluded from the CPI. The inclusion or exclusion of particular transactions will be discussed in more detail later in this chapter.
- 3.3 The scope of the CPI can be mapped to several dimensions, namely: Population coverage, geographical coverage, product coverage, prices and time. The scope is reflected in the product and geographical classifications for which basket weights, derived primarily from the Survey of Household Spending (SHS)²³, are assigned. The intention and ideal scenario is that each good or service in scope for the CPI be represented by observed transaction prices. However, operational constraints as well as the complexity of measuring the vast and continuously changing universe of consumer transactions make this impossible to achieve in practice. As for most statistical surveys, the CPI is based on a sample of collected prices.
- 3.4 Defining the scope of the CPI is both a conceptual and a practical exercise. The fundamental question regarding scope is: Does measuring the prices for a particular good or service fit the uses of the CPI? While there are many products for which prices could be collected, they may not necessarily suit the purposes of the index and therefore could be excluded from the scope. There are also some products which may be determined to be in scope for the CPI but for which it is too difficult to estimate consumer expenditures and/or price change. For these goods or services it is generally better to define them as out of scope than to include them without adequate measurement options.²⁴ The following sections of this chapter will discuss the conceptual and practical questions surrounding the scope of the CPI.

Population Coverage

- 3.5 The CPI target population is the group of people whose consumption expenditures are in the scope of the index. For the CPI, the target population consists of families and individuals living in urban and rural private households in Canada.²⁵
- 3.6 The definition of private households in the CPI is consistent with that used in the Canadian Census of Population.²⁶ Consumption expenditures made by people living in institutions or collective households (e.g. prisons or long term health care facilities), as well as members of the Canadian Forces living in military camps, are excluded from the CPI scope. Expenditures made by people living on First Nations reserves are also excluded from the CPI. The decision to exclude these expenditures is primarily based on the operational difficulty of collecting data applicable to these households.
- 3.7 The aim of the CPI is to measure domestic consumer price change, meaning that only transactions between the target population (private households in Canada) and establishments (businesses or governments) operating in Canada are in scope. Therefore, transactions made outside of the country (e.g., restaurant meals bought while on vacation in Brazil) or transactions made with online establishments that do not physically operate within the borders of Canada are not in scope for the CPI. However, online establishments that do have physical operations in the country (e.g. a shipping warehouse) are included in the CPI.

23. For information see the Statistics Canada Survey 3508.

24. Examples include gambling and life insurance.

25. All physical boundaries of Canada are not in scope for the Consumer Price Index. See sections 3.10-3.11 for more information on geographical coverage.

26. Statistics Canada, *Families Reference Guide, 2011 Census*, Catalogue No. 98-321-XWE201105.

- 3.8 In practice, the CPI does not strictly follow a 'domestic' approach because the weights used to compile the CPI basket, which are derived primarily from the SHS, follow the 'national' concept. This means they may include household expenditures made outside of the country. Additionally, the SHS does not include spending by foreigners while visiting Canada. While these expenditures are included in final domestic demand, it is not desirable to include them in the CPI given that the index's primary uses include determining domestic monetary policy and adjusting payments of wages of Canadian residents and businesses.
- 3.9 Having basket weights that follow a 'national' approach has a minimal impact on the CPI given that the proportion of consumer expenditures made outside of Canada relative to the expenditures made in the country is small. If data were available on the proportion of the consumer expenditures, by product, that were made out of the country, Statistics Canada could make efforts to remove this spending from the CPI basket. Alternatively, if the expenditure data were available efforts could be made to estimate the price change for the out-of-country transactions. However, the lack of data and the operational challenges in trying to estimate out-of-country price change make these options impractical. Moreover, including price change of out-of-country transactions is not suitable for the use of the index in guiding Canadian monetary policy.

Geographical Coverage

- 3.10 The CPI covers price change experienced by private households in the ten provinces as well as Yellowknife, Whitehorse and Iqaluit. Price change in all other areas of Yukon, the Northwest Territories and Nunavut are excluded from the scope of the CPI. While it would be desirable to include transactions made by private households in all areas within each Territory, from an operational perspective it is not practical to collect prices outside of Yellowknife, Whitehorse and Iqaluit. The decision to exclude areas outside of the main urban centres in Yukon, the Northwest Territories and Nunavut is based on the assumption that price change in the cities does not acceptably reflect price change in the remaining regions of the Territories. Therefore, the decision was made to limit the scope of the CPI to the three northern capital cities.
- 3.11 All areas within the ten provinces and the three northern capital cities are in scope for the CPI, meaning that movements in the indices represent price changes for the entire province or city specified. However, because of operational constraints having to do with price collection, generally prices are only collected in more heavily populated areas within each province. The rationale for only collecting prices in more populated areas is based on the fact that total consumer expenditures are greater in areas with more residents, so the basket weights for the less populated areas would be quite small. Additionally, there is an assumption that price changes in less populated areas generally follow similar trends to price changes in populated areas. In this context it is important to keep in mind that the CPI aims to measure price change not price levels.

Product Coverage

- 3.12 The CPI measures price change for consumer products, which are goods and services that are purchased for the purpose of consumption. For the most part, products included in the CPI must be associated with a transaction price, that is, with an amount of money that a consumer must pay to purchase a specific quantity and quality of a good or service.²⁷

27. Some areas of consumption, notably those within owned accommodation, do not have specific transaction prices associated with them and therefore must be imputed. These are included in the Consumer Price Index (CPI) despite the absence of specific transactions because they represent a significant proportion of consumer spending. The treatment of owned accommodation in the CPI is discussed in more detail in Chapter 10.

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- 3.13 Strictly speaking, long-lived assets are excluded from the CPI. This is because they are not purchased primarily for consumption in the near future. However, distinguishing between expenditures on products for consumption and expenditures on assets for investment purposes can be quite complex for many consumer product categories, the most challenging of which is housing. Housing is seen as an asset, a durable good which provides positive economic value over an extended period of time, so house prices are not directly included in the CPI. However, a house is also consumed gradually over time by the person living in it. This is why house prices enter indirectly into the measurement of the CPI component for owned accommodation. Separating the asset portion of the house from the consumption part of the house is not simple either in concept or in practice and this is why the treatment of owned accommodation is one of the most debatable issues surrounding the construction of CPIs around the world.²⁸
- 3.14 In addition to housing, there are various other product categories in which it is difficult to distinguish between consumption and investment. For this reason, a selective approach is employed in the CPI. For instance, in the category of insurance, premiums for homeowners' and tenants' property insurance as well as vehicle insurance are included in the CPI scope because their premiums are related to specific goods and services (the contract normally guarantees the replacement or restoration of specified goods). In contrast, life and disability insurance are excluded because the payments stipulated in the insurance contract may be interpreted as representing future purchasing power, which cannot be identified with the consumption of any specific good or service.
- 3.15 While investments are excluded from the scope of the CPI, additional costs associated with making an investment transaction such as commissions or fees paid to stock brokers are included in the CPI. These fees are associated with a service provided by a financial institution and are consumed by the purchaser.
- 3.16 Transfers are transactions where no specific goods or services are received in exchange for payments made. Income taxes are an example. Because transfers are not associated with the acquisition or consumption of specific products they are out of scope for the CPI.²⁹ Most goods and services financed through the public taxation system (e.g. public education, public health care) are considered transfers even though they are paid for through taxation, because a private household does not receive any specific good or service in exchange for the amount of taxes paid. Most public services are therefore excluded from the CPI.
- 3.17 However, not all goods or services that are publically provided are transfers. For instance some public goods and services have a direct user fee or cost of consumption associated with them, such as a passport, public transit, or health care charges for private hospital rooms or ambulance fees, and these are included in the CPI. Additionally, transactions made between private households and government-owned utilities or corporations, such as municipal water rates or postal services, are included in the CPI. While property taxes are classified as a transfer for many purposes, they are considered an integral part of the cost of owning and using a dwelling and thus are included in the calculation of the owned accommodation component of the CPI.³⁰ Other forms of transfers, including gifts, donations to charities, tips and gratuities are excluded from the CPI.³¹
- 3.18 From a conceptual standpoint, second hand or used goods are in scope for the CPI as long as there is a transaction between a private household and an establishment operating in Canada. However, in practice the prices for these products are usually not collected as part of the CPI sample because the associated consumption expenditures generally account for a very small proportion of overall consumer spending.
- 3.19 Interest that may be levied due to purchases made on credit, such as credit card or bank loan interest charges, is not included in the CPI. The issue of interest charges is very complex, raising both conceptual and practical challenges for which there is no consensus and no clear recommendation.³² The CPI does include interest paid on a mortgage, as it is deemed an integral part of consuming an owner-occupied dwelling.³³

28. The treatment of owned accommodation in the Consumer Price Index is discussed in more detail in Chapter 10.

29. International Labour Office (ILO) *et al.* (2004), paragraph 3.41.

30. The treatment of owned accommodation in the Consumer Price Index is discussed in more detail in Chapter 10.

31. ILO *et al.* (2004), paragraphs 3.45-3.46.

32. ILO *et al.* (2004), paragraphs 3.67-3.71.

33. The treatment of owned accommodation in the Consumer Price Index is discussed in more detail in Chapter 10.

- 3.20 Some but not all transactions involving the purchase of illegal or socially undesirable goods and services are in scope for a CPI.³⁴ The CPI takes a selective approach when deciding whether to include them or not. For example, tobacco products are included while illegal narcotics are deemed to be out of scope. Practical considerations in effectively measuring the prices involved in some of these transactions are a key factor.

Prices used in the Consumer Price Index

- 3.21 The prices included in the CPI are final prices, inclusive of all excise and other taxes paid by consumers. In particular, they include the Goods and Services Tax (GST), provincial retail sales taxes or Harmonized Sales Taxes (HST), as well as any environmental, liquor and tobacco taxes wherever applicable. It follows that the CPI could change as a result of changes in any of these types of taxes. In contrast, the CPI does not include changes in personal income taxes because as discussed above, these are transfers and are thus out of scope for the CPI.
- 3.22 Since the CPI includes only those transactions between private households in Canada and establishments operating in Canada, no foreign prices are included in the CPI. The prices of imported goods nevertheless have an important impact on the CPI because many of the products sold by resident establishments are either imported or have significant import content. As a result, changes in the exchange rate of the Canadian dollar against other currencies do have an impact on the CPI since they affect prices for imported goods which are then sold to domestic consumers.
- 3.23 Discounted prices are included in the CPI as long as they relate specifically to the product in question. That means the sale price cannot be tied to the purchase of another product (e.g. a consumer obtains a discount on a printer with the purchase of a computer). When discounts are offered in kind (e.g. free winter tires with the purchase of a new car) the purchase price is reduced by the monetary value of the product offered in kind.
- 3.24 The aim of the CPI is to measure the changes in prices paid by consumers and those prices sometimes differ from the associated sticker or list prices. However, data on transaction prices are not always observable for consumer products. Therefore, Statistics Canada collects Product Offers (POs) as proxies for transaction prices. For the CPI a PO is the presentation of a particular good or service, with an associated price, by a retailer to a purchaser. The POs used in the calculation of the CPI are determined by the sample.

Time Represented in the Consumer Price Index

- 3.25 The smallest unit of time represented in the CPI is one month. That is, the CPI represents price change from one month to another. While in practice, prices are observed at specific moments in time within a particular month, the published indices do not represent price change occurring at any time interval less than one month. Rather, the index measures the change in average prices in one month compared to average prices in another month.
- 3.26 There are three approaches which can guide decisions about when to collect and incorporate a given set of observed prices in the CPI. These approaches relate to the period in time when goods and services are paid for, acquired (that is, legally owned) or consumed (that is, used). The three need not coincide and would produce different CPIs. The 'payments approach' is taken when the prices relate to the period in which the expenditures for the product are made. The "acquisitions approach" involves observing prices at the time at which the good or service is obtained by the consumer (that is, when the legal ownership of the product passes to the consumer). The 'use approach' entails observing prices at the time when a product is consumed. These times of payment, acquisition and use might extend over more than one month. For many goods and services the difference between these three approaches is not significant, because the times when consumers pay, acquire and use goods and services are typically synchronized. However, for some products, particularly durable goods or large expenditure items, the timing of price observation can yield different results.

34. ILO *et al.* (2004), paragraphs 3.123-3.124.

- 3.27** For the majority of products, the CPI aims to follow the acquisitions approach, meaning that the observed prices relate to the transaction cost in the time period in which the legal ownership of the good passes to the consumer. The main reason for following the acquisitions approach is that it is consistent with an accrual accounting system³⁵ which is used in the Income and Expenditure Accounts in the Canadian System of National Accounts (CSNA).
- 3.28** There are also practical reasons for choosing the acquisitions approach. One, the data and information that would be required to measure the flow of service arising from the gradual consumption of various products generally makes the use approach an impractical one. Similarly, because many goods and services are purchased on credit, with multiple purchases frequently being amassed on one form of loan (e.g. a credit card whose balance is carried for many months), the consistent application of the payments approach across the CPI is not practical. Therefore, given the benefit of consistency with the accounting principles of the CSNA and Statistics Canada's practice of capturing price information from retailers' posted prices (POs), the acquisitions approach is the most suitable choice for the CPI.
- 3.29** There are special cases, either for conceptual or practical reasons, that the CPI may not strictly follow the acquisitions approach. A few examples include air fares, travel tours and traveller accommodation. While the observed prices relate to the period in which the consumer obtained ownership of the ticket, travel package or hotel reservation, the prices are applied to the index in the period in which the service is used. For example, if a consumer purchases a travel package in January for a holiday in March, the price is recorded in January (the time when the consumer obtained ownership of the service); however it will not enter the CPI calculation until March (the time when the service is used). In these cases, it is practical to apply a use approach because the exact period when the service is consumed is known with certainty.

35. An accrual accounting system reflects revenue and expenses in the period in which they are deemed to have been earned and incurred, whether or not they relate to cash receipts and disbursements in the same period. See Statistics Canada (2008).

Chapter 4 Classifications

- 4.1 The product and geographical classifications for the Consumer Price Index (CPI) are designed to meet three important criteria: 1) the classification reflects economic reality faced by consumers; 2) the classification meets the needs of index users, and 3) the classification is unambiguously mutually exclusive and exhaustive.³⁶
- 4.2 The product classification is a hierarchy of 695 elementary product classes up to the All-items CPI.³⁷ There are several intermediate aggregation stages that are relevant for different levels of analysis, including the eight major aggregates ("Food", "Shelter", "Household operations and furnishings", "Clothing and footwear", "Transportation", "Health and personal care", "Recreation, education and reading", and "Alcoholic beverages and tobacco products").
- 4.3 The geographical classification is a hierarchy of 19 geographical strata which aggregate to Canada. Most provinces and the three northern capital cities are represented by one stratum each. However, Quebec, Ontario and British Columbia are divided into three, four and two strata respectively. The allocation of strata within these provinces is based on Economic Regions defined by the Canadian Census of Population.³⁸ While indices are computed for each geographical stratum, indices are only published for Canada, the provinces, Yellowknife, Whitehorse and Iqaluit.
- 4.4 The intersections of the product and geographical classifications constitute the elementary aggregates of the CPI. Elementary aggregates are the lowest-level classes to which a set of fixed-quantity basket weights is assigned. For this reason, indices for elementary aggregates are the primary building blocks to construct all indices at higher aggregation levels. Additionally, they constitute the smallest elements by which it is possible to analyze and explain price movements at aggregate levels. Finally, elementary aggregates also serve as strata for price sampling with the purpose of enhancing the reliability and relevance of the indices that are derived from samples of collected prices.
- 4.5 Beyond these basic rules, the designation of elementary aggregates is a matter of compromises and balances between different, often contradictory, requirements. For example, creating many very detailed elementary aggregates could be advantageous as a guide for sampling. Narrowly defined groupings of goods and services and geographies are more likely to be homogeneous from the viewpoint of price changes, which would in turn enhance sampling efficiency. On the other hand, when elementary aggregates are looked at as building blocks of the CPI it becomes essential that the indices exhibit reasonable statistical reliability. This would be difficult to achieve for numerous detailed product and geography groupings without very large price samples.
- 4.6 With all of this in mind, in addition to the requirement of supporting the analysis of consumer price change by various users, effort is made to designate elementary aggregates as groupings of products and geographies that:
- 4.6.1 Have clear and economically meaningful content.
 - 4.6.2 Make possible the production of consumer price indices of acceptable statistical quality, given the available resources.
 - 4.6.3 Have a reasonable degree of homogeneity in the product and geographical dimensions.
- 4.7 The imperative characteristic of a classification, that it must be exhaustive (covering all goods and services and geographies within the scope of the CPI) as well as mutually exclusive (no product or geographical stratum can belong to more than one elementary aggregate), gives rise to the possibility of $695 \times 19 = 13,205$ elementary aggregates from the CPI classification. However, the number is smaller in practice due to lesser product detail in some geographical strata.

36. ILO *et al.* (2004), paragraph 3.14.

37. This is the number of elementary product classes based on the 2013 basket. See Statistics Canada Survey 2301.

38. The Consumer Price Index strata for Quebec, Ontario and British Columbia are based on Economic Regions (ERs) from the 2006 Canadian Census of Population.

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- 4.8 Elementary aggregates are the basis of the fixed-basket concept of the CPI. Indices for elementary aggregates (lower level) are the starting points of the CPI aggregation using the Lowe fixed-basket formula (upper level).³⁹
- 4.9 The Canadian CPI also makes use of basic classes, a chosen point in the classification in which the quantity weights are unchanged for the duration of the basket. This means that the quantities for elementary aggregates below the basic class level may be adjusted during the lifespan of a basket as long as the quantities at the basic class level are unchanged.⁴⁰
- 4.10 In many cases, basic classes are equal to elementary aggregates. For the CPI, basic classes are also the lowest level at which indices are published.
- 4.11 In an effort to further support the analysis of consumer price changes, many special aggregates are also produced. Special aggregates such as, "Goods", "Services", "All-items excluding Food and Energy", and "The Bank of Canada's Core Index",⁴¹ are constructed by aggregating different groups of elementary aggregate indices. These special aggregates are analytically helpful and are useful in understanding the contributions of certain elementary aggregates to overall price change.

39. The calculation of indices at the lower and upper levels is discussed in Chapter 6.

40. The Consumer Price Index basket weights and the process for updating them are discussed in Chapter 8.

41. The Bank of Canada's core index excludes eight of the Consumer Price Index's (CPI) most volatile components (fruit, fruit preparations and nuts; vegetables and vegetable preparations; mortgage interest cost; natural gas; fuel oil and other fuels; gasoline; inter-city transportation; and tobacco products and smokers' supplies) as well as the effects of changes in indirect taxes on the remaining components. For more information on the Core CPI please see the Bank of Canada's website www.bankofcanada.ca.

Chapter 5 Sample Strategy and Price Collection

- 5.1 The number and variety of transactions that consumers engage in is immense. It would be neither practical nor affordable to collect prices for all transactions of products sold in all outlets⁴² to compile the Consumer Price Index (CPI). Therefore a sample strategy is necessary.
- 5.2 The CPI has always had a policy of adopting the most appropriate measurement methodologies for each of its elementary indices. This has led to sometimes very divergent sampling practices in different parts of the CPI. This chapter will cover the range of sampling practices currently used in the CPI, first focusing on the general sampling approach which covers more than 50% of the CPI by basket weight.⁴³ The chapter will then discuss some of the more specific sampling approaches in other parts of the basket, including full universe price coverage, cut-off sampling and price modelling.
- 5.3 Not all elementary price indices are estimated with observed prices. For some elementary aggregates, particularly the "catch-all" classes with heterogeneous product mixes that typically represent more marginal consumer expenditures, price collection is not practical or necessary. In these cases, imputations are made whereby the price movement of the elementary aggregate is estimated via proxy, using the price movement of a donor class.

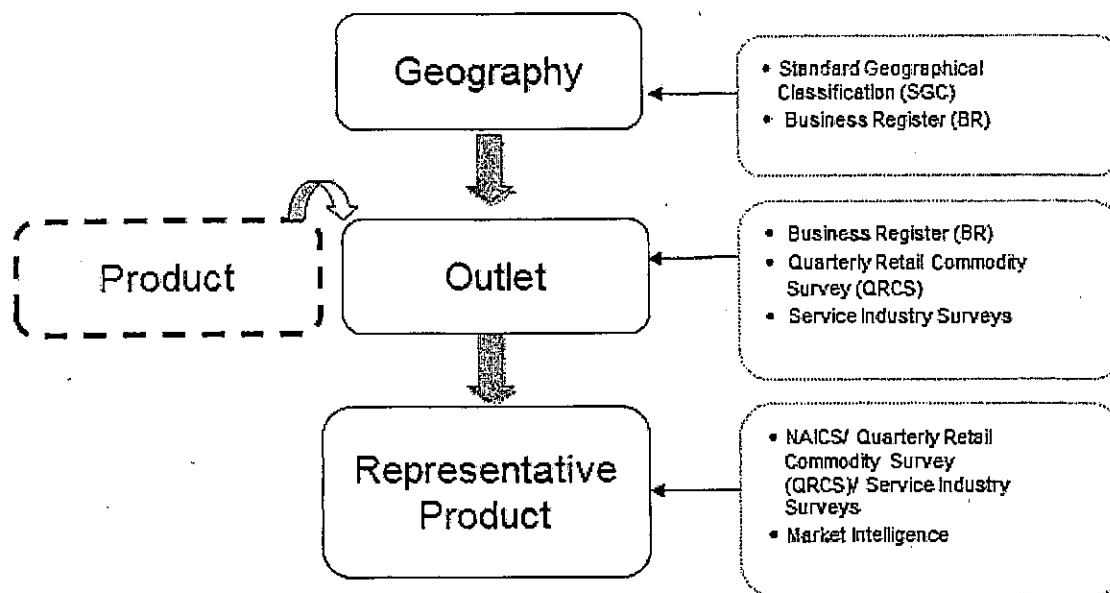
General Sampling Approach

- 5.4 The general sampling approach for the CPI can be seen as a three-stage survey design. The first stage covers geography, the second is for outlets and the third stage is for the products. Even though the product component appears at the last stage, types of products have a major influence during the second stage when outlets are selected. Figure 5.1 depicts this general approach for selecting sampling units, starting from geography, then using the product type information for outlet selection and then assigning Representative Products (RPs) to be observed within each outlet. More details on each of these stages are provided in the following paragraphs.

42. The term "outlet" refers not just to stores in the normal sense of that word, but also Internet sellers, vending machines, door-to-door vendors, catalogue mail order merchants, telephone salespeople and vendors using other means to connect with customers. Nevertheless, the vast majority of Consumer Price Index price quotes are collected in traditional retail stores.

43. This proportion of the products in the Consumer Price Index which are covered by the general sampling strategy is estimated using the 2013 basket weights. Statistics Canada, Survey 2301.

Figure 5.1
Stages of Sampling Strategy in the Consumer Price Index



- 5.5 The geographical sampling unit is primarily the Census Sub-Division (CSD) as defined by Statistics Canada's Standard Geographical Classification (SGC). CSDs are similar to municipalities and are chosen for the CPI sample based on information such as population counts and economic activity.⁴⁴ The CSDs are selected as the sampling unit mainly because they are stable over time and because every location in the Business Register (BR),⁴⁵ the frame for outlet selection, is mapped to CSDs.
- 5.6 To facilitate outlet sampling and price collection management, CPI collection areas have been defined. For small to medium size CSDs, collection areas correspond to the CSD. In cases where the CSD is too large to represent one collection area it is broken down into smaller areas which are amalgamations of Census Tracts (CTs), which can be seen as equivalent to neighbourhoods. The number of collection areas within a CSD depends on the number and variety of retail and services locations as well as the size, in terms of square kilometres, of the CSD.⁴⁶
- 5.7 The CPI survey frame is used to select the outlets where price collection is to take place. The frame was built using existing Statistics Canada sources, mainly the BR, the quarterly Retail Commodity Survey (RCS)⁴⁷ and services industry surveys such as the monthly Food Services and Drinking Places Survey. The RCS and services industry surveys are used to link the CPI product classification to the industry classification in the BR, which is the North American Industrial Classification System (NAICS).⁴⁸
- 5.8 A major feature of the CPI survey frame is that it gives the revenue, according to the BR, of each outlet by RCS commodity class or service industry using the data reported in various Statistics Canada surveys. This characteristic of the frame helps in dealing with big retailers such as the department stores, which typically sell a range of products. It facilitates the selection of outlets which are among the most popular in each product class or service industry.

44. Beaulieu (2012).

45. The Business Register is a listing of all business units that operate in Canada. It is compiled and used by Statistics Canada for use in conducting business surveys.

46. More details are available in Beaulieu (2012).

47. Statistics Canada Survey 2008.

48. Beaulieu (2012).

- 5.9 The outlet sampling process for the CPI is done in two phases. The first phase, pre-contact sampling, is designed to validate the information from the BR, such as activity status, industrial classification and contact information. Depending on the industrial classification, additional questions may be asked to determine whether specific products are sold. This phase is done quarterly, by telephone. The second phase, field sampling, consists of selecting a subset of outlets from the pre-contact output (after all out-of-scope and refusal units are removed) to be sent for field collection by specialized Statistics Canada employees, known as price interviewers. Remaining in-scope outlets that were not selected for the field sample are kept as a replacement list.
- 5.10 After outlets are selected, a set of RPs is assigned to be observed in each outlet. Subject matter experts use external databases and market research to help define RPs in a way that strikes a balance between specificity and flexibility. Price interviewers then select specific products that meet the RP definitions. This approach ensures the interviewers have a clear understanding about what kind of product to select (keeping intact the matched-model approach of the CPI) while at the same time providing leeway to choose products that are locally popular (upholding the representativeness of the estimated elementary indices).
- 5.11 The RP list may be different from one outlet to another according to the information obtained from the CPI survey frame and the pre-contact phase. For example, one pharmacy may be designated to have health care goods as well as some food items (such as milk and bread) collected, if those products correspond to its main streams of revenue. However, this may not be the case for all pharmacies in the CPI sample.
- 5.12 The number of RPs assigned to each elementary aggregate depends on the weight and the complexity of measuring price change for the given product class. In a complex elementary aggregate, one which may have a lot of heterogeneous products included, several RPs will likely be assigned. In a more simple elementary aggregate, just one or two RPs might be enough to measure price change adequately.
- 5.13 An RP assigned to an outlet is called a Target Product Offer (TPO). The TPO acts as the sample intention. The sampling allocation scheme allots a number of TPOs to each elementary aggregate, taking into account the basket weight, price variability and cost of collection for each elementary aggregate. The objective is to allocate the available sample optimally in order to estimate elementary indices of the best possible quality.⁴⁹
- 5.14 Every month the price interviewers observe Product Offers (POs) for TPOs. The monthly process begins with a detailed sample request from headquarters to the interviewers. Most of this request is the same as in the previous month, since the CPI follows the matched-model approach. The sample request is loaded into Computer-Assisted Personal Interview (CAPI) devices. Carrying these devices, the interviewers visit each of the outlets in their particular workload. In each outlet, the interviewer finds the required POs and enters their prices and characteristics into the devices.
- 5.15 When a PO is advertised as being "on special" interviewers record this in the CAPI device. If the item cannot be found because the shelf is empty, the interviewer consults with a store manager and determines whether it is temporarily out of stock or is no longer carried by the outlet. Either way, this information is recorded in the device and transmitted back to Statistics Canada headquarters.
- 5.16 If the PO being sought is determined to be no longer carried, a substitute PO is selected and this information is recorded in the CAPI device. For especially complex POs such as high-tech goods and items of clothing, the interviewers also fill out forms providing additional details about the characteristics of the substitute PO. This additional information assists the analysts at headquarters who assess the extent of quality change and estimate an appropriate adjustment.⁵⁰
- 5.17 When an interviewer must select a substitute PO, as just described, he or she is guided by the RP description, a set of detailed product specifications loaded in the CAPI devices. The interviewer is asked to select a substitute PO that fits the description.

49. Beaulieu (2012).

50. Quality adjustment techniques used in the Consumer Price Index are discussed in Chapter 7.

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- 5.18 For many RPs it is not necessary to observe POs every month, either because their prices tend to change less frequently or because they are only available in specific times of the year. For one example, tuition fees typically change only once a year, in a predictable month, so they are collected only in that month. For another, Internet access service fees are collected every second month because their prices change infrequently. In fact, every RP description specifies the month(s) of collection.
- 5.19 If a price change is known to take place outside an RP's default pricing schedule Statistics Canada will conduct a special pricing.⁵¹ This ensures that elementary indices represent, as much as possible, price change in a timely manner.⁵²
- 5.20 As for the timing of collection within the month, most POs are observed in the first two weeks, with the first week being defined as the one containing at least three business days from the calendar month. Gasoline prices are an exception due to their typical intra-month volatility and thus are collected in four weeks.
- 5.21 When the POs have been collected they are sent to Statistics Canada headquarters by encrypted digital transmission, where they are compared against the original sample request to determine the sample's completeness and conformity to requirements. Thereafter, the POs undergo further review and processing. Any unusual price movements are carefully checked to ascertain their validity. Corrections are made if necessary. Where POs have been substituted, the degree of quality difference is assessed and an appropriate quality adjustment is made if necessary. Steps are also taken to ensure the POs include applicable taxes. Finally, with all checks and adjustments completed, the elementary price indices are calculated.

Specific Sampling Approaches

- 5.22 Exceptions are made to the general sampling approach. These exceptions are intended to capture price change for elementary aggregates where information on the universe of consumer transactions is available or where the attributes of the products within the elementary aggregate are complex and require different techniques.
- 5.23 Elementary aggregates where full information on the universe of consumer transactions is available include those goods or services that have only one market and/or seller. Examples include passport fees and drivers' licenses. For these there is no sample drawn because all prices are collected and used in the CPI.
- 5.24 For some elementary aggregates in which there is one seller in a particular geographical stratum,⁵³ a sample of outlets and products is not required. However, in these cases the first stage of the general sampling approach, in which collection areas are selected, is still necessary. Usually, the collection of these POs is done by employees at Statistics Canada headquarters rather than by interviewers in the field.
- 5.25 The prices used to calculate the rent price index come from the Labour Force Survey, which uses a probabilistic sample.⁵⁴
- 5.26 Some elementary aggregates in the CPI follow cut-off sampling.⁵⁵ When there is information available on the outlet and/or product universe the goal is to maximize the coverage of both. Most times information on market composition comes from third party administrative databases, often available via the Internet. These databases are used to rank outlets and/or products so the sample covers a majority of the market. Once TPOs are assigned via cut-off sampling, POs are collected at Statistics Canada headquarters.

51. Examples where special pricing occurs include tax changes or other advertised/scheduled price changes, such as increases to government regulated service fees.

52. The default pricing frequency for each basic class in the Consumer Price Index is listed in Appendix B.

53. Examples of product classes where there is one seller in a particular geographical stratum include some public utilities such as water or electricity companies.

54. Statistics Canada, Survey 3701.

55. Examples of elementary aggregates that use cut-off sampling are the purchase of passenger vehicles, and various telecommunication indices such as telephone services, Internet access services and cablevision and satellite services.

- 5.27 There are some elementary aggregates where the target population purchases bundles of services rather than individual products⁵⁶ or where prices are based on a set of specific conditions.⁵⁷ The CPI uses the profiles method to capture price change for these products.
- 5.28 Representative bundles or consumer profiles are selected using available market information. The intention is to cover a majority of the services and outlets that are available in a particular market. In these cases POs for the defined consumer profiles are observed at Statistics Canada headquarters from large industry databases.
- 5.29 The profiles method is another application of the matched-model framework. By observing POs of identical consumer profiles every month, this method ensures that the quantity and quality of bundled services are constant over time and that the CPI reflects pure price change. As with the entire CPI sample, it is important that consumer profiles are reviewed and updated regularly to ensure that representative consumption bundles are being priced. When profiles must be changed because the component products are determined to be new or of different quality, then quality adjustment techniques should be applied.
- 5.30 Some elementary aggregates are characterized by products whose prices are determined not by their physical characteristics, but by their intellectual content and novelty. For these elementary aggregates the CPI uses the bestsellers method to estimate price change.⁵⁸ In these cases POs are observed in the field by price interviewers as well as on the Internet.
- 5.31 There are two elementary aggregates which use modelling to estimate price change: the Mortgage interest cost and the Homeowners' replacement cost indices, two components of the owner-occupied accommodation price index. Unlike the treatment of other durable goods in the CPI, owner-occupied housing follows a user-cost approach, which aims to measure the implicit price of the flow of services coming from a fixed stock of owned dwellings. This price index requires special measurement methods. Using collected data from the Survey of Household Spending,⁵⁹ along with other data inputs on house prices and interest rates, price change is estimated.⁶⁰

56. Examples of elementary aggregates that follow the profiles method are products that are typically purchased in package form, such as banking fees, Internet service fees, cable and satellite television fees and telephone services.

57. The best example of such a product is insurance, as home or car insurance premiums are based on the characteristics of the home or driver being insured as well as the desired coverage characteristics.

58. An example of an elementary aggregate that uses the bestsellers method is Books and other printed matter (excluding textbooks). The price index is based on the estimated total cost of the top 10 bestsellers in sampled bookstores in each period.

59. Statistics Canada, Survey 3508.

60. The treatment of owner-occupied accommodation in the Consumer Price Index along with the specific model calculations for the Mortgage interest cost and Homeowner's replacement cost indices are discussed in Chapter 10.

Chapter 6 Calculation of the Consumer Price Index

- 6.1 The Consumer Price Index (CPI) is calculated in two stages, termed the lower level and the upper level.
- 6.2 At the lower level of calculation, price change is estimated for elementary aggregates. These are found at the lowest level in the product and geographical classifications of the CPI and are most often calculated using a Jevons (geometric mean) index number formula. Elementary aggregates consist of similar groups of products in a geographical stratum.⁶¹
- 6.3 At the upper level, an asymmetrically-weighted fixed-basket Lowe price index formula (Laspeyres-type) is used to combine elementary aggregates in order to obtain upper level aggregate indexes.
- 6.4 This chapter will discuss the two-stage calculation of the CPI, first explaining the computation of elementary indices at the lower level. While the chapter will focus on the standard method for computing indices, some non-standard methods used in the CPI will also be discussed. Then the chapter will explain the method used to aggregate elementary price indices to the upper level.

Calculation of Elementary Indices (lower level)

- 6.5 At the lower level, elementary price indices are calculated for 695 elementary product classes in each of the 19 geographical strata of the CPI.⁶² Elementary indices can be understood as the building blocks of the CPI and represent the lowest level of the fixed-basket index hierarchy. Estimation of price change at this level is usually done via the standard approach for elementary price index calculation. Exceptions are made for special cases addressed later in this chapter.⁶³
- 6.6 Not all elementary indices are derived directly from observed prices. At the Canada level, 76% of elementary indices, by basket weight, are derived directly from observed prices within their product class and geography. Table 6.1 shows that the proportion of elementary indices estimated with direct price observation varies across geography. The remaining portion of elementary indices is imputed, either from another closely related product class, or from the same product class in another geographic stratum.⁶⁴

61. Classifications of the Consumer Price Index are discussed in Chapter 4.

62. There are slightly fewer elementary aggregates (that is, "Building blocks") to the Consumer Price Index than the maximum of 695 X 19 because not all of the 19 geographic strata have the full 695 product classes. The absence of product classes occurs mainly in the small geographic strata. Each elementary aggregate has a corresponding expenditure weight used in the upper-level calculation. This number of elementary aggregates is based on the 2013 basket. Statistics Canada, Survey 2301.

63. Some common index formulae used to calculate elementary price indices can be found in Appendix A.

64. Of these elementary aggregates estimated by proxy, roughly half, by basket weight, are product imputations (e.g. price movements for college tuition fees are imputed from the price movement of university tuition fees within each geographic stratum) and the other half are geographic imputations (e.g. price movements for baseball game admission fees in Prince Edward Island are imputed from those in Toronto).

Table 6.1
Proportion of elementary aggregates, estimated with direct price observation

Geography	Proportion (%)
Canada	75.8
Newfoundland and Labrador	87.8
Prince Edward Island	87.8
Nova Scotia	87.8
New Brunswick	86.7
Quebec	79.0
Ontario	75.2
Manitoba	86.9
Saskatchewan	87.4
Alberta	86.0
British Columbia	76.2
Yellowknife	80.5
Whitehorse	81.7
Iqaluit	67.8

Note: The proportion of elementary indices is based on 2013 basket weights.

Source: Statistics Canada, Consumer Prices Division, Survey No. 2301.

- 6.7 Most of the elementary aggregates that are not calculated using observed prices are catch-all product classes; as such, they represent more marginal and diverse varieties of products which do not fit neatly into any of the other elementary product classes. Typically these catch-all product classes would also be significantly more expensive to estimate via direct price observation. Their price change is usually estimated by imputing the price movement from another elementary price index for which prices are observed.
- 6.8 While it would appear ideal that all elementary price indices be calculated using observed prices within their product class, this is not always necessary. Since the goal of the CPI is to measure price change, and not absolute price levels, sampling strategies are developed to reflect which product offers (POs) are the most important to capture directly, and which others may be suitably estimated via imputation.⁶⁵
- 6.9 The CPI follows the matched-model approach for calculating elementary price indices whereby identical (unchanging quantity and quality) POs are followed through time. However, it is not always possible to follow the same products across time, as new goods and services are constantly emerging and old ones disappearing. When an identical PO cannot be collected in a subsequent period, a replacement PO must be observed. This chapter will not discuss situations where POs are replaced.⁶⁶
- 6.10 Examples where the calculation of elementary price indices is a relatively simple matter are the few elementary aggregates for which there is one product having a single price. These product classes typically have goods or services for which prices are determined by a level of government, such as drivers' licenses or passport fees. In such cases, the ratio of one month's price over the previous month is the best estimate of price change. However, for the majority of elementary product classes reality is more complex, mainly because of the availability of many competing and continuously changing product types.
- 6.11 In the majority of cases, elementary price indices are based on a sample of prices for one or more goods or services belonging to the elementary product class. The sampled POs receive equal weighting in this elementary calculation, because consumer expenditure weighting information is usually not available at this level.

65. The sampling strategy for the Consumer Price Index is discussed in Chapter 5.

66. The ways in which adjustments are made for the quality changes that may occur when product offers (PO) are replaced are discussed in Chapter 7.

6.12 The following section describes the standard approach for calculating elementary price indices. The chapter will then go on to discuss several of the elementary price indices for which estimation methods differ from the standard approach either because of the complex nature of estimating price change for the goods and services within the elementary product class or because additional information is available that can be used to produce an improved elementary price index.⁶⁷

The Standard Approach for Calculating Elementary Price Indices

6.13 The standard approach refers to the most commonly used method of combining prices, in order to estimate price change for elementary aggregates in the CPI. Typically consumer expenditure patterns below the elementary aggregate level are not known and therefore the implicitly weighted geometric mean, known as the Jevons formula (6.1), is used to calculate an average price relative from the sample of the collected POs. This means the price relative of each collected PO is assigned equal importance in the calculation. The Jevons formula has been used by Statistics Canada since 1995 as its primary formula for the calculation of elementary price indices in the CPI.

$$I_{J,a}^{t-1:t} = \prod_{i=1}^n \left(\frac{p_i^t}{p_i^{t-1}} \right)^{1/n} \quad (6.1)$$

Where:

$I_{J,a}^{t-1:t}$ is the implicitly weighted Jevons price index for elementary aggregate a between period $t-1$ and period t ;

n is the number of POs i in elementary aggregate a ; and

$\frac{p_i^t}{p_i^{t-1}}$ is the price relative for PO i between period $t-1$ and period t .

6.14 The Jevons formula (6.1) can also be calculated by taking the ratio of the implicitly weighted geometric mean prices of the observed POs in the two periods being compared (6.2).

$$I_{J,a}^{t-1:t} = \frac{\prod_{i=1}^n (p_i^t)^{1/n}}{\prod_{i=1}^n (p_i^{t-1})^{1/n}} \quad (6.2)$$

Where:

$\prod_{i=1}^n (p_i^t)^{1/n}$ is the geometric mean price for all POs i for elementary aggregate a in period t ; and

$\prod_{i=1}^n (p_i^{t-1})^{1/n}$ is the geometric mean price for all POs i for elementary aggregate a in period $t-1$.

67. A listing of all of the basic classes in the Consumer Price Index including their methods of estimation is in Appendix B.

6.15 The Jevons formula was adopted because it has advantages over the previously used Dutot formula.⁶⁸ Firstly, the geometric mean of price relatives (Jevons) is less influenced by extreme prices than is the ratio of arithmetic mean prices (Dutot). The resulting elementary price indices are less volatile.⁶⁹ Secondly, elementary price indices that are calculated as geometric means of price relatives (Jevons) can be interpreted in two ways; first, as an average of price changes (6.1) and second as a change in average prices (6.2). The first interpretation, which is only applicable to the Jevons formula, is convenient for explaining the composition of aggregate price changes.

Other Methods for Calculating Elementary Price Indices

6.16 Among the 695 elementary product indices there are several departures from the standard approach.⁷⁰ Exceptions to the standard approach are usually made because more complete information is available on the universe of transactions within the elementary aggregate.

6.17 Post-1995, arithmetic formulas were retained for the calculation of a few elementary price indices (Rent, Passenger vehicle insurance premiums and Tuition fees). What sets these elementary aggregates apart is that the sampled POs are drawn from a population frame and there is confidence that the sample sufficiently represents the universe of consumer expenditures for these product classes. Furthermore, the contractual nature of the expenditures in these product classes means that it is likely that product substitution will not take place over the period of price comparison. The unweighted arithmetic formula used in the Canadian CPI is the Dutot (6.3).⁷¹

$$I_{D,a}^{t-1:t} = \frac{\sum_{i=1}^n \frac{1}{n} p_i^t}{\sum_{i=1}^n \frac{1}{n} p_i^{t-1}} \quad (6.3)$$

Where:

$I_{D,a}^{t-1:t}$ is the Dutot price index for elementary aggregate a between period $t-1$ and period t ;

n is the number of POs i in elementary aggregate a ;

$\sum_{i=1}^n \frac{1}{n} p_i^t$ is the arithmetic mean price for all POs i for elementary aggregate a in period t ; and

$\sum_{i=1}^n \frac{1}{n} p_i^{t-1}$ is the arithmetic mean price for all POs i for elementary aggregate a in period $t-1$.

68. The Dutot formula was used as the standard method for calculating elementary price indices in the Consumer Price Index prior to 1995.

69. The geometric mean of price relatives (Jevons) can be more volatile than the ratio of arithmetic mean prices (Dutot). This occurs in the case of very steep price drops as with liquidation sales. Liquidation sale prices, although they are part of the universe of consumer expenditures which the Consumer Price Index (CPI) aims to measure, are excluded from the CPI sample. This is because liquidation sales are deemed less representative of the average consumer transaction.

70. A listing of all of the basic classes in the Consumer Price Index including their method of estimation is in Appendix B.

71. The use of the Dutot formula is appropriate when product offers are expressed in a homogenous unit of measure. ILO *et al.* (2004), paragraphs 20.64-20.68. When quantity or expenditure information is available, an explicitly weighted Laspeyres-type formula (6.5) can be used, with the same weights appearing in the numerator and the denominator.

6.18 An explicitly weighted Jevons formula (6.4) is used in few special cases where more detailed expenditure information is available below the elementary aggregate level. Examples where an explicitly weighted Jevons formula is used are the indices for Postal fees, Newspapers and magazines, Urban transit and Parking rates.

$$I_{WJ,a}^{t-1,t} = \frac{\prod_{i=1}^n (p_i^t)^{w_i / \sum_{i=1}^n w_i}}{\prod_{i=1}^n (p_i^{t-1})^{w_i / \sum_{i=1}^n w_i}} \quad (6.4)$$

Where:

$I_{WJ,a}^{t-1,t}$ is the explicitly weighted Jevons price index for elementary aggregate a between period $t-1$ and period t ; n is the number of collected POs i in elementary aggregate a ;

$\prod_{i=1}^n (p_i^t)^{w_i / \sum_{i=1}^n w_i}$ is the explicitly weighted geometric mean price for all POs i in elementary aggregate a in period t ;

$\prod_{i=1}^n (p_i^{t-1})^{w_i / \sum_{i=1}^n w_i}$ is the explicitly weighted geometric mean price for all POs i for elementary aggregate a in period $t-1$; and

$$w_i / \sum_{i=1}^n w_i$$

is the weight of PO i as a proportion of the aggregate weight for all POs.

6.19 The weights used in the calculation do not have to relate to the period of price comparison, however in each comparison period they are fixed. The weights are obtained from administrative records or other data sources. These cases can be seen as improvements on the standard approach because rather than giving implicit equal importance to each price relative (6.1) they make use of additional information about the relative importance, or size, of each group of transactions.

6.20 In cases where there are different product types available within one elementary aggregate, but each product type is homogeneous, a unit value index is a preferred method for calculating elementary price indices. A unit value index is simply the quantity-weighted average transaction price for all products within an elementary aggregate in one period, divided by the quantity-weighted average transaction price in the previous period. The rationale for using a unit value calculation must be based on a reasonable assumption that the changes in these average prices do not reflect a change in quality over time. Otherwise the index could be prone to bias.⁷²

6.21 The CPI uses a unit value calculation for the Spectator entertainment index, which includes prices for stadium sports seating and live staged performances. The assumption behind this index is that if the stadium or theatre is full in each of the two periods being compared, there is likely to be no change in the overall quality, even though seats may be valued differently. In effect, the price of all seats in the stadium or theatre is used rather than a few individual seats. A similar approach is used to calculate the Air fares index.

72. Balk (2002) showed that unit value ratios require special consideration, as they are not only driven by price change but can also be driven by changing quantities.

6.22 A unit value calculation is also used in the Property taxes elementary price index. A sample of properties is drawn so that the average annual property tax paid in a given municipality can be calculated. These calculated average annual taxes are then multiplied by the total stock of dwellings in each municipality in order to obtain the average annual property tax paid in each CPI geographical stratum. No attempt is made to control for differences in the quality of services that homeowners receive in exchange for their tax payments from one municipality to another. Additionally, there is no treatment to control for changes in the quality of municipal services from one period to another. Accounting for these differences is impractical as there are no data available which associate specific municipal services to proportions of property taxes paid.⁷³

Calculation of the Consumer Price Index Above Elementary Indices (upper level)

6.23 The calculation of the CPI at the upper level is relatively straightforward compared to the lower level. It involves aggregating calculated elementary price indices by applying an asymmetrically weighted arithmetic fixed-basket formula in order to obtain aggregate indices which culminate in the All-items CPI.⁷⁴

6.24 The Laspeyres formula (6.5) is a basic method for calculating price indices and is consistent with the CPI's fixed basket concept. It expresses the change in the cost between period 0 and period t of buying a fixed basket of products, by aggregating the prices of the products in the basket using quantities consumed from the price reference period 0 as weights.

$$I_{L,A}^{0:t} = \frac{\sum_{i=1}^n p_i^t q_i^0}{\sum_{i=1}^n p_i^0 q_i^0}$$

(6.5)

Where:

$I_{L,A}^{0:t}$ is the Laspeyres price index of aggregate class A between period 0 and t ;

n is the number of elementary aggregates i in the aggregate class A;

p_i^t is the price of elementary aggregate i , in time t ;

p_i^0 is the price of elementary aggregate i , in time 0; and

q_i^0 is the quantity weight of elementary aggregate i , in the price reference period 0.

73. The treatment of owned accommodation in the Consumer Price Index is discussed in Chapter 10.

74. Some common formulae for calculating aggregate price indices (above the elementary level) can be found in Appendix A.

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6.25 In practice, the Laspeyres index is not commonly used to calculate the CPI because it requires information on the quantities consumed⁷⁵ in the price reference period 0 and these data are not available in a timely manner. This has to do with the fact that household expenditure surveys are typically produced with a lag. Therefore, since Statistics Canada aims to produce a CPI that is timely, in that it measures changes in prices for recent periods, the Laspeyres formula must be altered to use quantities from a period preceding the price reference period 0. This transformation is the Lowe formula (6.6), a more general form of a Laspeyres index because the quantities come from a chosen weight reference period b which precedes the price reference period 0.

$$I_{L0,A}^{0,t} = \frac{\sum_{i=1}^n p_i^t q_i^b}{\sum_{i=1}^n p_i^0 q_i^b} \quad (6.6)$$

Where:

- $I_{L0,A}^{0,t}$ is the Lowe price index of aggregate class A between period 0 and t ;
- n is the number of elementary aggregates i in the aggregate class A ;
- p_i^t is the price of elementary aggregate i , in time t ;
- p_i^0 is the price of elementary aggregate i , in time 0; and
- q_i^b is the quantity weight of elementary aggregate i , in the weight reference period b , with $b \leq 0 < t$.

6.26 The Lowe index can also be expressed as the weighted sum of elementary price indices (6.7) with the weights expressed as expenditure shares.

$$I_{L0,A}^{0,t} = \sum_{i=1}^n (p_i^t / p_i^0) s_i^{0b} \quad (6.7)$$

Where:

- p_i^t / p_i^0 is the price index of elementary aggregate (i) between period 0 and t , and;

$$s_i^{0b} \equiv \frac{p_i^0 q_i^b}{\sum_{i=1}^n p_i^0 q_i^b} \quad (6.8)$$

6.27 The expenditure shares s_i^{0b} in the Lowe formula (6.7) are hybrid expenditures because the prices and quantities (that equal the expenditures when multiplied) are from different periods, 0 and b .

75. In practice, what are observed are the expenditures, which contain the implicit p and q terms.

- 6.28 Hybrid expenditures (6.8) are obtained by updating the original expenditure weights $p_i^b q_i^b$ (observed in the weight reference period b) to reflect the prices of the price reference period 0 using the price relatives p_i^0 / p_i^b . This process is often referred to as price-updating and thus hybrid expenditure weights are frequently termed price-updated weights.⁷⁶ The use of price-updated or hybrid expenditure weights is essential to the fixed-quantity basket concept of the CPI.
- 6.29 Because the weights used in the calculation of the CPI are obtained from consumer expenditure data with a weight reference period that precedes the price reference period 0, the Lowe index formula is the practical option for computing a timely CPI.
- 6.30 Notwithstanding this practical advantage, the Lowe formula also has many desirable properties. One is its consistency in aggregation. This means that no matter order in which the elementary price indices are aggregated (for example first by geographical stratum and then by product class, or the reverse) the aggregate index results are the same.
- 6.31 Another desirable property of the Lowe formula is its transitivity⁷⁷, whereby the ratio of two Lowe indices using the same set of basket reference quantities q^b is also a Lowe index (6.9).⁷⁸ This property is useful because it enables index compilers to calculate short-term price movements. For example, price change between period $t-1$ and period t can be estimated by taking the ratio of two long-term Lowe price indices, one comparing periods 0 and $t-1$ and the other comparing periods 0 and t .

$$I_{Lo,A}^{t-t} = \frac{\sum_{i=1}^n p_i^t q_i^b}{\sum_{i=1}^n p_i^{t-1} q_i^b} = \frac{\sum_{i=1}^n p_i^t q_i^b}{\sum_{i=1}^n p_i^0 q_i^b} \left(\frac{I_{Lo,A}^{0:t}}{I_{Lo,A}^{0:t-1}} \right)$$

(6.9)

Where:

$I_{Lo,A}^{t-t}$ is the short term Lowe index for aggregate (A) between period $t-1$ and period t ;

$I_{Lo,A}^{0:t}$ is the long term Lowe index for aggregate (A) between period 0 and period t , and;

$I_{Lo,A}^{0:t-1}$ is the long term Lowe index for aggregate (A) between period 0 and period $t-1$.

76. ILO *et al.* (2004), paragraph 1.29.

77. Transitivity is an axiomatic property of index number formulae. Satisfying this property enables price indices to be calculated via chained or direct price comparison. For more information on this property, ILO *et al.* (2004), paragraphs 9.25 and 15.88.

78. ILO *et al.* (2004), paragraph 1.26.

6.32 The transitive property of the Lowe formula also enables index compilers to calculate long-term price change by chaining together short-term price indices. For example, a Lowe index comparing prices in period t to prices in the price reference period 0 is obtained by multiplying the Lowe index comparing period t to period $t-1$ by the Lowe index comparing period $t-1$ with the price reference period 0 (6.10). The product of monthly chained indices provides identical results to an index that directly compares prices in period t to prices in the price reference period 0.

$$I_{Lo,A}^{0:t} = \underbrace{\left[\frac{\sum_{i=1}^n p_i^1 q_i^b}{\sum_{i=1}^n p_i^0 q_i^b} \right]}_{I_{Lo,A}^{0:1}} \times \underbrace{\left[\frac{\sum_{i=1}^n p_i^2 q_i^b}{\sum_{i=1}^n p_i^1 q_i^b} \right]}_{I_{Lo,A}^{1:2}} \times \dots \times \underbrace{\left[\frac{\sum_{i=1}^n p_i^{t-2} q_i^b}{\sum_{i=1}^n p_i^{t-3} q_i^b} \right]}_{I_{Lo,A}^{t-3:t-2}} \times \underbrace{\left[\frac{\sum_{i=1}^n p_i^{t-1} q_i^b}{\sum_{i=1}^n p_i^{t-2} q_i^b} \right]}_{I_{Lo,A}^{t-2:t-1}} \times \underbrace{\left[\frac{\sum_{i=1}^n p_i^t q_i^b}{\sum_{i=1}^n p_i^{t-1} q_i^b} \right]}_{I_{Lo,A}^{t-1:t}} \left(\frac{p_i^t}{p_i^{t-1}} \right) s_i^{t-1b}$$

$$I_{Lo,A}^{0:t} = \frac{\sum_{i=1}^n p_i^t q_i^b}{\sum_{i=1}^n p_i^0 q_i^b} \quad (6.10)$$

Where:

$I_{Lo,A}^{0:t}$ is the long-term Lowe index for aggregate class A between period 0 and t ;

$I_{Lo,A}^{t-1:t}$ is the monthly short-term Lowe index for aggregate A; and

s_i^{t-1b} is the hybrid expenditure share of elementary aggregate i , with quantities from the basket reference period b expressed at period $t-1$ prices, derived as (6.11).

$$s_i^{t-1b} = \frac{p_i^{t-1} q_i^b}{\sum_{i=1}^n p_i^{t-1} q_i^b} \quad (6.11)$$

6.33 In any given period t the hybrid expenditure shares price-updated to period $t-1$ are used to aggregate elementary price indices. Since hybrid expenditure weights are an estimate of the value of purchasing the quantities from the weight reference period b expressed in period $t-1$ prices, they do not reflect changes in consumer purchasing patterns. These are necessary in order to maintain the fixed quantity concept of the Lowe formula.

6.34 In the ongoing practice of compiling the CPI, hybrid expenditure shares (6.11) are not explicitly calculated.

Instead, the equivalent Lowe formula is used (6.12), where monthly price relatives $\left(\frac{p'_i}{p_i^{t-1}}\right)$ multiplied by hybrid expenditure weights expressed at period $t-1$ prices are compared to the hybrid expenditures expressed at period 0 prices in order to obtain price change between period 0 and t .

$$\begin{aligned}
 I_{L, A}^{0:t} &= \frac{\sum_{i=1}^n \left(\frac{p'_i}{p_i^{t-1}}\right) (p_i^{t-1} q_i^b)}{\sum_{i=1}^n (p_i^0 q_i^b)} \\
 &= \frac{\sum_{i=1}^n \left(\frac{p'_i}{p_i^{t-1}}\right) \left(\frac{p_i^{t-1}}{p_i^0}\right) (p_i^0 q_i^b)}{\sum_{i=1}^n (p_i^0 q_i^b)}
 \end{aligned}
 \tag{6.12}$$

6.35 Despite all the practical advantages of using the Lowe formula for calculating the upper level of the CPI, it is an asymmetrically weighted price index, meaning that the weights used to aggregate elementary price indices refer to a period preceding the price reference month. For this reason the Lowe formula does not represent the current spending patterns of consumers and therefore is subject to substitution bias.⁷⁹

79. The topic of substitution bias in a Consumer Price Index, as well as the efforts by Statistics Canada to reduce it, are discussed in Chapter 9.

Chapter 7 Quality Change and Adjustment

- 7.1 The Canadian Consumer Price Index (CPI) aims to measure pure price change, thus excluding price changes that are due to differences in the quality of products bought by consumers. It achieves this mostly through the matched-model approach which tracks unchanging products in the same outlets, thus holding all variables constant except for the month when prices are observed.
- 7.2 The universe of products bought and sold in the marketplace changes over time. Updating the sample for any given elementary aggregate is inevitable in order to maintain its representativeness. As products in the market change, observed product offers (POs) may change. This means that the matched-model framework at times does not hold, and therefore price changes could reflect a mixture of price and quality differences. In order to measure pure price change, quality adjustments are performed.
- 7.3 There are multiple techniques, implicit (indirect) and explicit (direct), available to account for quality differences between exiting and entering POs. This chapter will present the different methods used in the CPI.⁸⁰
- 7.4 It is not always necessary or possible to adjust for quality change when a PO must be replaced in the CPI sample. There are various reasons why adjusting for quality change may not be required and a direct price comparison between entering and exiting POs is the best option. Direct price comparison, an implicit method of quality adjustment, is the simplest approach used in the CPI.
- 7.5 The CPI employs the direct price comparison method when there is no perceived difference in quality between entering and exiting POs. This method assumes equivalent quality between POs and is used for just over 30%, by basket weight, of the elementary indices.⁸¹
- 7.6 The use of the direct price comparison method for these elementary indices is not likely to lead to any systematic bias in the CPI because the majority of these indices fall under one of the following categories.
- 7.6.1 No appreciable quality change: Many items like gasoline, electricity or natural gas are essentially of the same quality over long periods of time.
 - 7.6.2 Non-market services: Most government-regulated services, such as university education, local transportation or passports, do not receive any treatment for quality change. While it could be argued that the quality of these services may change through time, this is likely to happen very slowly and is difficult to measure. These services are also not available in a competitive market so little can be said about the market valuation of the quality features that are implied.
 - 7.6.3 Bestsellers method: In the case of popular media, such as books, movies or DVDs, it is common international practice to simply aggregate the prices of the top bestsellers and compare the result to that for the previous period's bestsellers, even if these best sellers are different in the two periods. This is because the novelty of the product's content is what is being sought out by consumers, rather than any tangible physical characteristic such as number of pages or quality of the binding, to take books as an example.
 - 7.6.4 The use of the unit value index method also eliminates the need for any further quality adjustment. This index calculation method is rarely used in the CPI and can only be applied in cases where it is assumed that the average quality represented remains constant through time.⁸²

80. The different quality adjustment methods used for the basic classes in the Consumer Price Index are indicated in Appendix B.

81. The proportion of elementary indices is based on 2011 basket weights. Statistics Canada, Survey number 2301.

82. The unit value method is discussed in paragraph 6.22.

- 7.7 The use of overlap pricing can also eliminate or significantly reduce the need to make explicit quality adjustments. This implicit method allows for the reduction of unexpected disappearances of sampled POs and ensures that new representative products can be introduced into the sample before the replaced ones disappear from the market or become unrepresentative. The overlap pricing method is most commonly used in conjunction with the profiles method, enabling the collection of a replacement profile before the obsolescence of an existing one.⁸³
- 7.8 Overall mean imputation is another implicit method used in the CPI to make quality adjustments between the prices of POs entering and exiting the sample. With this method, the price movement applied to entering POs is based on the observed average price movement of all other POs for the same representative product. Overall mean imputation relies on the assumption that the donor POs are comparable to the PO being imputed.
- 7.9 The link-to-show-no-change method for quality adjustment, another indirect method, involves forcing a price relative of unity (equals no price change) when replacement POs enter the sample. Currently, this practice is being reduced across the CPI because it introduces a degree of undue price stability in the index.⁸⁴
- 7.10 Quantity adjustment entails accounting for changes in the quantity (e.g. package size, number of tissue ply etc.) of observed POs. This is another implicit method of quality adjustment because it is assumed that the quality per standardized unit is the same over time.
- 7.11 Quantity adjustment is the default treatment for nearly all of the POs in the Food major aggregate as well as some of the products in the Household operations, and Personal care supplies and equipment aggregates.⁸⁵
- 7.12 For the majority of elementary indices, not covered by the implicit methods described above, it is necessary to make explicit quality adjustments when POs enter or exit the sample.
- 7.13 To make the appropriate quality comparison, Statistics Canada is usually guided by market valuations of the two POs. Where possible, the two POs are compared in terms of the quality features they offer to consumers. A PO is thought to provide a range of features to the consumer which, grouped together, determine the market price.⁸⁶ This general framework is the basis for many of the explicit quality adjustment methods described below.
- 7.14 The CPI relies on the hedonic quality adjustment technique for certain elementary aggregates, notably in the case of high technology goods or services. Currently, the CPI uses hedonic quality adjustment for the Computer equipment, software and supplies and Internet access services indices. The hedonic method of quality adjustment is most appropriate for products whose markets are competitive and experience rapid turnover, and where the characteristics of these products change quickly but are readily and consistently observable.
- 7.15 The hedonic method is applied in the case of forced replacements. This approach assumes that a relationship exists between the price of a PO and its characteristics. Hedonic specifications have to be defined using standard regression techniques.⁸⁷ In period t (when a previously observed PO is no longer available) a regression is used to estimate the unobserved price for the entering PO in period $t-1$. The estimation of the $t-1$ price is based on quality differences between the entering and exiting POs, as well as the $t-1$ price of the exiting PO.

83. While the Internet services elementary index is calculated using the profiles method, adjusting for quality differences between exiting and entering profiles is done via hedonic quality adjustment in this case.

84. ILO *et al.* (2004), paragraph 7.70.

85. The weight of these expenditure categories can be seen in Appendix B.

86. The characteristics approach was introduced by Lancaster (1986). Consistent with a characteristics approach, ILO *et al.* (2004) defines a product, for measurement purposes, as equating to a complete description of its price-determining characteristics. For a Consumer Price Index program, the demand side of the equation is relevant (consumers' valuation of these characteristics), rather than the supply side (producers' costs or inventory).

87. The functional form is selected from a large family of Box-Cox transformations using appropriate statistical tests.

7.16 A semi-log hedonic regression is used for the Computer equipment, software and supplies index. It takes the general form:

$$\ln(p'_n) = \beta_0 + \sum_{i=1}^k \beta_i X'_{i,n} + e'_n \quad (7.1)$$

Where:

β_i is a range of effects for a set of k characteristics $X'_{i,n}$, $i = 1, 2, \dots, k$, that are used to explain variations in the natural log of the price.

7.17 Coefficients of the semi-log hedonic regression are estimated once a year using product characteristics data and retail prices obtained from the Internet and third party databases. All other things being equal, a coefficient represents the impact of a given product characteristic on price movement.

7.18 For the Internet access services elementary aggregate, a double log functional form is used. Statistical analysis found that this model better explained the variation in prices of various consumer bundles offered by several Internet service providers. This means the natural logarithm of price is explained by the logarithm of the explanatory variables. The formula is:

$$\ln(p'_n) = \beta_0 + \beta_1 \ln(X'_{i,n}) + \beta_2 \ln(X'_{i,n})^2 + e'_n \quad (7.2)$$

Where:

β_i is a range of effects for a set of k characteristics X_i , $i = 1, 2, \dots, k$, that explain variations in the natural log of the price.

7.19 The option cost method is another explicit approach for making quality adjustments to entering POs in the CPI sample. This technique relies on having data about the specific costs for adding options or quality characteristics to a product. In this explicit method, an adjustment to the last observed price of the exiting PO is made so that it can be compared with the observed price of the entering PO. The option cost method is most commonly used for products where the manufacturer or retailer provides pricing details for the available product characteristics. The CPI uses the option cost method in the elementary aggregates corresponding to the Purchase of passenger vehicles index.

7.20 Expert judgment has, in the past, been a predominant practice for explicit quality adjustment in the CPI. This relies upon an employee with expertise in a particular product market to assess and give a valuation to differences in quality between exiting and entering POs. However, the practice of quality adjustment by expert judgment is not arbitrary⁸⁸ and follows procedural guidelines for choosing the most plausible quality ratio between exiting and entering POs. The expert judgment method is primarily used for elementary indices under the Clothing and footwear major aggregate.

7.21 The option cost and expert judgment explicit approaches to quality adjustment are used in the CPI for cases where a complex decision has to be made, and where it is not appropriate to apply an implicit method such as overall mean imputation.

88. The expert judgment method has been evaluated internally by Statistics Canada using variance analysis (ANOVA). The goal of this analysis was to test whether average price differed according to the characteristics relied on by the subject matter experts. In 85% of cases the characteristics used by the expert were those which explained differences in average prices.

Chapter 8 Weights and Basket Updates

Meaning and Construction of the Consumer Price Index Weights

- 8.1 The Consumer Price Index (CPI) basket weights are expenditures derived primarily from the Survey of Household Spending (SHS) for a given reference year.⁸⁹ The basket weights are actually hybrid expenditures, meaning that the prices and quantities of the expenditures come from different periods. Hybrid expenditure weights are essential to the fixed- basket concept of the CPI.⁹⁰
- 8.2 Generally speaking, the SHS is designed to provide information on spending by private households that is detailed enough for, and consistent with the CPI scope and definitions. The CPI weights are constructed from aggregate household expenditures. This type of weighting, known as plutocratic, implies that each household contributes to the total weight of an elementary aggregate proportionally to their respective spending.⁹¹
- 8.3 For the most part the SHS is used to derive the weights for the elementary aggregates by concurring the SHS estimates to the product and geographical classifications of the CPI. However, the SHS sometimes does not provide sufficient detail and thus basket weights are in some instances constructed from alternative sources.
- 8.4 The basket weights for the Replacement cost and Mortgage interest cost elementary indices are two examples in which supplementary data are required to construct the weight.⁹² Additionally, alternative data sources which include other Statistics Canada surveys, administrative data and scanner data from retailers are used to break down aggregate expenditures further for product classes in which the SHS does not provide sufficient detail.
- 8.5 Supplementary data are also used to confront specific SHS expenditure estimates which may be suspected of bias. For example, expenditures for alcohol and tobacco are often thought to be under-reported in household expenditure surveys, as the survey estimates are typically lower than reported in retail sales and government excise tax revenue data.⁹³
- 8.6 At the time of a basket update, Statistics Canada also uses the Bortkiewicz-Szulc decomposition to evaluate expenditures used as basket weights.⁹⁴ This method compares relative changes in quantities with the corresponding relative changes in prices in order to assess the reliability of the expenditure weights.
- 8.7 Assessing the quality of expenditure data also helps Statistics Canada determine the number of basic classes in the CPI (that is, the levels in the product and geographical classifications at which the quantity weights are fixed for the duration of a basket).⁹⁵
- 8.8 Basic classes are determined based on the availability and quality of the consumer expenditure data as well as the stability of the distribution of spending within elementary aggregates. For example, if the distribution of consumer spending within a given elementary aggregate changes frequently, then it is may be advantageous to allow the quantities in the expenditure weight to be updated when new information on consumer spending is available. In such a case Statistics Canada will designate the basic class to be the one above the elementary aggregates where quantities may be updated during the life of the basket.
- 8.9 The practice of changing the quantities below the basic class level between basket updates provides benefits in that it allows for new information on consumer spending to be incorporated into the CPI in a timely manner.

89. Statistics Canada, Survey number 3508.

90. The calculation of a fixed-quantity-weighted price index is discussed in Chapter 6. However, the quantities themselves are not directly observed, but are rather implicitly contained in the expenditures.

91. ILO *et al.* (2004), paragraph 18.2.

92. The treatment of owned accommodation in the Consumer Price Index is discussed in Chapter 10.

93. The quality of expenditure data are evaluated using outlier detection across basket reference years, micro data analysis, as well as coefficient of variation (CV) analysis.

94. Chaffe *et al.* (2007).

95. The meaning and use of basic classes in the Consumer Price Index is discussed in Chapter 4.

Updating the Consumer Price Index Basket

- 8.10 The process of updating the CPI basket is to make the weights assigned to elementary aggregates representative of current consumer spending patterns. In the past, the basket for the CPI was updated every four to five years⁹⁶ using new expenditure data from the most recent SHS. Starting with the 2011 basket update, the CPI weights are updated biennially. While there is no rule as to how often a CPI basket should be updated, there is general agreement among CPI compilers that more frequent basket updates are preferred.⁹⁷
- 8.11 In addition to updating and assuring the quality of the weights, the exercise of a basket update also provides an opportunity to review and update other aspects of the indices which may include:
- 8.11.1 Changing the product and/or geographical classifications to be more representative.
 - 8.11.2 Reviewing and updating the sample of representative products and outlets.
 - 8.11.3 Updating weights below the elementary aggregate level.
 - 8.11.4 Reviewing methods and concepts for the elementary indices.
 - 8.11.5 Updating documentation and products for dissemination.
- 8.12 The final stage of a basket update is to chain-link the new fixed-quantity basket to the old fixed-quantity basket in order to produce indices that are a continuous time series. For this reason, the CPI is referred to as a chain of fixed-basket indices.

Chain-linking Indices Across Baskets

- 8.13 Published consumer price indices are calculated as a chain of fixed-basket indices. This means that a sequence of fixed-basket indices have been chained together to create a continuous time series. This type of chaining is not to be confused with the calculation of monthly chained indices⁹⁸ but rather refers to the process of chaining indices across baskets. This is necessary to avoid having breaks in an index when a basket update is performed.
- 8.14 Chain-linking indices across baskets takes place at the time of a basket update. In order to chain indices across baskets, hybrid expenditure weights for the old and new baskets must be expressed at the prices of a common period. This common period is called the link month.
- 8.15 Link month weights are obtained by price-updating the original expenditure weights to obtain the hybrid expenditures expressed at prices of the link month.
- 8.16 Since the basket reference period b of the CPI is a full year, a process called weight adjustment is necessary to obtain monthly hybrid expenditures for the link month. Monthly hybrid expenditures for the link month are calculated in two steps.
- 8.17 First, the annual expenditures for the basket reference year b are divided by the average price change for the basket reference year. This calculation provides a monthly expenditure, called the initial value, for the month preceding the basket reference year b . This first step implicitly assumes that the quantities of the basket are constant for each month of the basket reference year.
- 8.18 In the second step, the initial values are price updated to the link month in order to express the value of the fixed quantities of the basket at the prices of the link month.⁹⁹ Once the link month hybrid expenditures for the new basket are obtained, aggregate indices can be calculated using the new basket.

96. A chronology of basket updates of the Consumer Price Index is provided in Chapter 11 and Appendix C.

97. One of the findings of Boskin *et al.* (1996) was that having more current expenditure weights could reduce the substitution bias in a Consumer Price Index.

98. The monthly chained form of the Lowe index is discussed in Chapter 6.

99. Statistics Canada publishes two sets of Consumer Price Index basket weights. One expresses the values of the fixed-quantity basket at basket reference prices and the other at basket link month prices. Statistics Canada, Survey number 2301.

8.19 In the month following the basket link month, price indices calculated using the new basket are multiplied by the index levels previously published for the old basket.

8.20 Chain-linking of indices is done separately for each basic class.¹⁰⁰ Currently the CPI is published with an index reference period of 2002=100. In 2002 the CPI was based on the 1996 basket. Since the 1996 basket there have been six basket updates with the following link months:

- 2001 basket linked in December 2002;
- 2001 revised basket linked in June 2004;
- 2005 basket linked in April 2007;
- 2009 basket linked in April 2011;
- 2011 basket linked in January 2013 and
- 2013 basket linked in December 2014.

8.21 Following the introduction of the 2011 basket, any chain-linked index with an index reference period of 2002=100 is a chain of six fixed-baskets (8.1).

$$I_{chained}^{2002;t} = I_{2013}^{Dec2014;t} \times I_{2011}^{Jan2013;Dec2014} \times I_{2009}^{Apr2011;Jan2013} \times I_{2005}^{Apr2007;Apr2011} \times I_{2001r}^{Jun2004;Apr2007} \times I_{2001}^{Dec2002;Jun2004} \times I_{1996}^{2002;Dec2002} \quad (8.1)$$

Where:

$I_{chained}^{2002;t}$ is a chained index for the price observation period t with a price reference period equal to 2002;

$I_{2013}^{Dec2014;t}$ is an index for the price observation period t with December 2014 as the price reference period, calculated using the 2013 basket;

$I_{2011}^{Jan2013;Dec2014}$ is an index for December 2014 with January 2013 as the price reference period, calculated using the 2011 basket;

$I_{2009}^{Apr2011;Jan2013}$ is an index for January 2013 with April 2011 as the price reference period, calculated using the 2009 basket;

$I_{2005}^{Apr2007;Apr2011}$ is an index for April 2011 with April 2007 as the price reference period, calculated using the 2005 basket;

$I_{2001r}^{Jun2004;Apr2007}$ is an index for April 2007 with June 2004 as the price reference period, calculated using the 2001 revised basket;

$I_{2001}^{Dec2002;Jun2004}$ is an index for June 2004 with December 2002 as the price reference period, calculated using the 2001 basket;

$I_{1996}^{2002;Dec2002}$ is an index for December 2002 with 2002 as the price reference period, calculated using the 1996 basket.

100. It should be noted that the method of chain-linking indices across baskets is such that aggregate indices are not the direct average of their respective sub-indices. In exceptional cases, this may cause the level of an aggregate index to fall slightly outside the range of its sub-indices. ILO *et al.* (2004), paragraph 9.113.

Contributions to Index Percentage Change Across Baskets

8.22 The calculation of contributions to percentage change must be modified when the 12-month percentage change of an index spans two baskets, that is, when a basket update was performed between the two periods of comparison (period t and period $t-12$). This is because indices chained across baskets are computed using more than one fixed basket. Hence there can be no single expression of the importance (weight) of each sub-aggregate.¹⁰¹

8.23 The 12-month contribution to change for a composite price index that is chained across two baskets

$\left(\frac{I_A^{0:t}}{I_A^{0:t-12}} - 1 \right)$ is calculated in two parts. The first relates to the old basket and the second to the new basket.

Unchained indices must be used to derive contributions across baskets (8.2).

$$\left(\frac{I_A^{0:t}}{I_A^{0:t-12}} - 1 \right) = \underbrace{\left[\sum_i \left(\frac{I_i^{0:link}}{I_i^{0:t-12}} - 1 \right) \times W_i^{t-12_old} \right]}_{\text{old basket contributions}} + \underbrace{\left[\sum_i \left(\frac{I_i^{link:t}}{I_i^{link:link}} - 1 \right) \times W_i^{link_new} \times I_A^{t-12:link} \right]}_{\text{new basket contributions}}$$

$$\text{with } I_i^{link:link} = 100$$

(8.2)

Where:

$W_i^{t-12_old}$ is the weight of component i according to the old basket valued at the $t-12$ period price;

$W_i^{link_new}$ is the weight of component i according to the new basket valued at the link month period price; and

$I_A^{t-12:link}$ is the aggregate index in the link month with price reference period $t-12$.

8.24 When calculating contributions to 12-month percentage change on an index that spans across two baskets, it is possible that the summed old basket contributions and summed new basket contributions have opposite signs (+/-). The resulting contribution to the 12-month percentage change in the aggregate index could therefore have the opposite sign of the corresponding 12-month percentage change in the index. In other words, a given sub-aggregate can have a positive 12-month contribution to its aggregate while posting a negative 12-month price change and vice-versa.

101. Contributions to price index change are discussed in Chapter 2.

Rebasing an Index

- 8.25 As discussed in Chapter 2, the index reference period or index base period is the period in which the index is set to equal 100. For the CPI, the index base period is usually a calendar year expressed as "index year=100". Currently the index base period for the CPI is 2002=100. However, the index reference period of the CPI is changed periodically to coincide with the index base period of other major economic indicators produced by Statistics Canada. The process of changing the index base period is known as rebasing.
- 8.26 There are many reasons why users may need CPI series with index base periods other than those used in the published CPI. For example, they might need a series whose index reference period corresponds to the starting period of a particular wage or payment contract, so they can easily calculate the adjustments to be made. Those interested in comparing consumer price changes between countries might need a CPI series on an index reference period that corresponds with the index base period of another country. The need to change the index base period of CPI series may also result from the technical requirements of an index computation procedure, such as chain-linking across baskets.
- 8.27 The rebasing of an index (that is, its conversion from one index reference period to another) is an arithmetic operation that does not affect the rate of price change measured by the series between any two periods. To rebase an index $I^{g,t}$ to express it for a new index reference period h , all values in the index time series are divided by a constant. This constant $I^{g,h}$ is an index for price observation period h (which will be the new index reference period) with the initial index reference period g . The calculated results are then multiplied by 100 in order to obtain the new rebased index, with index reference period h equal to 100.

$$I^{h,t} = \frac{I^{g,t}}{I^{g,h}} \times 100 \quad (8.3)$$

Where:

$I^{h,t}$ is the index for a price observation period t with the new index reference period h ;

$I^{g,t}$ is the index for a price observation period t with the initial index reference period g ; and

$I^{g,h}$ is the index for price observation period h with the initial index reference period g .

- 8.28 As an example take the All-items CPI for Canada published with an index reference period 2002=100. An extract of this series is shown in Table 8.1 in the column headed $I^{2002,t}$. These indices have been converted into the following two new index reference periods: January 2012=100 and 2012=100. They are presented in Table 8.1 in the columns headed $I^{Jan2012,t}$ and $I^{2012,t}$.
- 8.29 To calculate $I^{Jan2012,t}$ using the original index $I^{2002,t}$ the series is divided by the constant $I^{2002:Jan2012}$. To calculate $I^{2012,t}$ using the original index $I^{2002,t}$ the series is divided by the constant $I^{2002:2012}$.

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Table 8.1
Example of Index Rebasing

Index price observation period: t	$I^{2002=t}$	$I^{Jan 2012=t}$	$I^{2012=t}$
Jan-12	120.7	100.0= $\frac{I^{2002:Jan 2012}}{I^{2002:Jan 2012}} \times 100 = \frac{120.7}{120.7} \times 100$	99.2= $\frac{I^{2002:Jan 2012}}{I^{2012:Jan 2012}} \times 100 = \frac{120.7}{121.7} \times 100$
Feb-12	121.2	100.4	99.6
Mar-12	121.7	100.8	100.0
Apr-12	122.2	101.2	100.4
May-12	122.1	101.2	100.3
Jun-12	121.6	100.7	99.9
Jul-12	121.5	100.7	99.9
Aug-12	121.8	100.9	100.1
Sep-12	122.0	101.1	100.3
Oct-12	122.2	101.2	100.4
Nov-12	121.9	101.0	100.2
Dec-12	121.2	100.4	99.6
2012 average	121.7	100.9	100.0
Jan-13	121.3	100.5	99.7
Feb-13	122.7	101.7	100.8
Mar-13	122.9	101.8	101.0
Apr-13	122.7	101.7	100.8
May-13	123.0	101.9	101.1
Jun-13	123.0	101.9 = $\frac{I^{2002:Jun 2013}}{I^{2002:Jan 2012}} \times 100 = \frac{123}{120.7} \times 100$	101.1 = $\frac{I^{2002:Jun 2013}}{I^{2012:Jan 2012}} \times 100 = \frac{123}{121.7} \times 100$

Source: Statistics Canada, CANSIM Table 326-0020.

8.30 Since all indices in any given column of Table 8.1 are derived from original indices with an index reference period 2002=100 divided by a constant, the rate of price change in all the rebased series is the same as in the original series. Small differences in percentage changes may result due to rounding when average index values are calculated. It should be noted, however, that differences between index levels, sometimes referred to as differences in index points, vary with the change of the index reference period. Therefore, users who would like to use the CPI for purposes of indexation are advised to use the rate of price change (the percentage change between index values) rather than using the difference in index points.

Chapter 9 Reliability and Uncertainty

- 9.1 The Consumer Price Index (CPI) is widely used and trusted by Canadians. The index is never revised, which means it can be used to settle contracts without concern that those contracts may have to be reopened at a later time. The index release dates are typically announced a year in advance and firmly adhered to. The data usually become available three weeks after the price observation period. The index is available in considerable detail and without charge from Statistics Canada.¹⁰²
- 9.2 As a sample-based statistic, the CPI, like all such statistics, cannot with 100% accuracy estimate the underlying (but unobserved) 'true' value it aims to measure. Nevertheless, the size of any statistical error or bias associated with the CPI is likely to be small enough to be within the range of tolerance of most users.
- 9.3 This chapter is about the error and bias properties of the CPI. Error refers to non-systematic inaccuracies introduced potentially at all stages of estimation. Errors which are systematic, meaning they lead to consistent over- or under-estimation of the phenomenon being measured, are called biases.¹⁰³
- 9.4 The goal of this chapter is to inform users about the various ways in which statistical and non-statistical error gets into the CPI and the steps taken by Statistics Canada to minimize the error. The chapter is organized under two main themes. One is the error associated with the estimation of indices at the lower level, while the other discusses the error entering into the calculation of the CPI at the upper level.

Error at the Lower Level of Consumer Price Index Calculation

- 9.5 Since elementary price indices are derived from statistical samples, they are subject to sampling errors. These errors will surely have sampling variance¹⁰⁴ and they may also have statistical bias, although efforts are made to minimize any such bias.¹⁰⁵ Other things being equal, a larger sample size should yield a smaller sampling variance for a given elementary index.
- 9.6 Most of Statistics Canada's surveys have samples drawn randomly from a frame of all in-scope units. Information about the number and size of units in the statistical population makes it possible to analyze the sample properties and calculate estimates of the variance and bias associated with any calculated estimates. If this were the case for the CPI it would be possible to report, for each elementary price index, a corresponding estimate of its sampling variance and bias. However, no comprehensive frame of all consumer products is available and for this reason it is generally not possible to estimate the variance and bias of elementary price indices.
- 9.7 For a small number of elementary aggregates in the CPI – notably drivers' licenses, passenger and vehicle registration fees – a single price rules the market within each geographical stratum. As a result, these elementary price indices do not have sampling error.
- 9.8 There are also cases where, although prices vary, information is available on virtually all consumer transactions and therefore estimates of price change have minimal sampling error. An example of such a case is the Tuition fees index in the CPI where data are available on prices and enrolment by program for every university.

102. Availability of the Consumer Price Index data from Statistics Canada is discussed in Chapter 2.

103. Statistics Canada (2003), paragraph 3.4.2.

104. Sampling variance is the extent to which the estimate of a characteristic from different possible samples of the same size and the same design differ from one another. Statistics Canada (2003), paragraph 3.4.1.

105. The current Canada-level sample size for each basic class in the Consumer Price Index is shown in Appendix B.

- 9.9** In the CPI there are also some elementary price indices that are not calculated via sampling and price observation, but rather by imputation.¹⁰⁶ For the most part these elementary aggregates are individually small residual groupings of products that serve to make the classification exhaustive.¹⁰⁷ The statistical error of these imputed elementary price indices would be similar to those of the donor indices. Since many of these imputed elementary price indices are “catch-all” categories, which are individually and small and dispersed across the CPI basket, it is unlikely this estimation method results in a significant increase in the error of the CPI.
- 9.10** In an ideal, simple situation an elementary aggregate would refer to a group of homogenous products and accurate information on the prices and quantities of all consumer transactions would be available in a timely manner. In such a case, the average transaction price (unit value) for one month divided by the average price in the previous month would provide an accurate estimate of price change for the elementary aggregate.
- 9.11** In reality, product classes are rarely fully homogeneous and full transactions information is rarely available. For this reason elementary price indices must be estimated using sampling methods.¹⁰⁸ Additionally, elementary aggregates in the CPI usually include many varieties of competing products and outlets entering and exiting the market. Because of these complexities, which are common to most elementary aggregates, there is potential for error at the lower level of CPI estimation.
- 9.12** The general sampling approach for the CPI involves three stages.¹⁰⁹ Two of the stages (geography and outlets) use full or partial frames for the selection of sampling units. However, there is no comprehensive frame for all products that consumers buy. Therefore, in the vast majority of cases, the third stage, in which representative products are designated, is done judgmentally. Sampling error can be introduced at any of the stages of the sample selection process. The potential for sampling error is greater in the selection of outlets and greatest for products because there is no comprehensive frame from which to select units for sampling. Since the CPI sample is selected using some partial frames and judgmental methods it is not possible to estimate accurately the sampling error of elementary price indices.
- 9.13** Error at the lower-level of the CPI may arise because of delays in introducing new products into the sample in a timely manner. The matched-model approach used in the CPI requires comparison of identical product offers (POs) over time and as a result there is a delay between the time when new products appear in the market and when their corresponding price movements are captured in the CPI. This type of error can never be completely eliminated while continuing to use the matched model approach. However, such errors can be mitigated with improved and timely sample management.¹¹⁰

106. The assumption behind the treatment of these elementary aggregates is that the price movements of their unobserved products move in parallel with the price movement of observed products in the donor class. The sampling strategy for the Consumer Price Index is discussed in Chapter 5.

107. Individually these elementary aggregates hold a small weight in the Consumer Price Index (CPI) basket. Together, they represent approximately 12% of the CPI by expenditure weight according to the 2013 basket. Statistics Canada, Survey number 2301. Indices calculated via imputation can be seen in Appendix B as the basic classes with a sample size of zero.

108. The sampling strategy for the Consumer Price Index is discussed in Chapter 5.

109. The sampling strategy for the Consumer Price Index is discussed in Chapter 5.

110. The sampling strategy for the Consumer Price Index is discussed in Chapter 5.

- 9.14 As with new products, a delay in the introduction of new outlets into the CPI sample can be a source of error. In a competitive retail market, new outlets appear from time to time offering different levels of services or prices. As a result consumers may change where they shop. The CPI does not immediately capture price movements resulting from changes in the retail landscape because the outlet sample is not redrawn every month. As a result, error from outlet substitution can occur.¹¹¹ To counteract this type of error, the CPI outlet sample needs to be refreshed frequently to capture price movements in new outlets.
- 9.15 Bias arising from the emergence of new outlets occurs when new stores enter the market offering lower prices, thereby inducing consumers to switch outlets. Again this is a difficult source of potential bias to avoid completely, but efforts are made to refresh the outlet sample periodically to minimize this kind of bias.
- 9.16 Other types of error associated with the estimation of elementary price indices include various processing and clerical errors. Error can arise due to the various corrections and adjustments that are made to collected prices. The different methods used to adjust for quality change in the CPI can be imperfect and as such represent a source of error. However, effort is taken to continuously review the methods used and ensure the most appropriate quality adjustment methods are applied. Previous studies have found little indication that quality adjustments across the elementary aggregates of the CPI are consistently biased in an upward or downward direction.¹¹²
- 9.17 Clerical errors might occur when POs are being recorded by the price interviewers. However, efforts are made to minimize errors of this kind. The Computer Assisted Personal Interviewer (CAPI) devices used by the price interviewers include automatic tolerance checks and alert the price interviewers of any suspicious values as they are transcribed. In addition, once the data have been transmitted to Statistics Canada headquarters they are subjected to further verification and analysis. When unusual prices or price movements are detected, subject matter experts sometimes send a "Request for Additional Information" memo back to the price interviewers to obtain additional explanatory information on the PO.
- 9.18 Consumer Price Index calculations are carried out with computer software, which largely eliminates the possibility of arithmetic errors. However, the potential for programming errors is present. In 2001 a new methodology was introduced for the Traveller accommodation elementary price index and errors were made in programming the algorithm for the new method. When the error was discovered and corrected a few years later, it was found to have caused a downward bias in the elementary index. Since that time, more rigorous testing procedures have been put in place to ensure such errors do not go undetected.
- 9.19 The CPI sampling strategy makes use of sample frames when selecting geographical collection areas, outlets and some products.¹¹³ These frames can be subject to different types of error. For instance, there are likely to be delays in updating the outlet frame to include new in-scope units and to remove units no longer in scope. In addition, information about the size of individual units – typically sales data – are also subject to possible error. Some of this information comes from administrative data sources such as tax records and some is derived from other Statistics Canada surveys. In either case, the unit size information is typically subject to both sampling and non-sampling error.

111. Hayman (2006).

112. Rossiter (2005) and Sabourin (2012). Kryvtsov (2013) demonstrates that quality adjustment bias by itself is very small in the Canadian Consumer Price Index.

113. The sampling strategy for the Consumer Price Index is discussed in Chapter 5.

Error at the Upper Level of Consumer Price Index Calculation

- 9.20 The calculation of price indices at the upper level of the CPI is accomplished using the Lowe price index formula. To estimate any particular aggregate index, a weighted average of its component elementary price indices is calculated. There are two possible sources of error in this calculation, both of which relate to the basket weights used in the aggregation. The first refers to errors that could be present in the expenditure estimates used as weights. The second is substitution bias which stems from the use of the Lowe formula at the upper level.
- 9.21 The Survey of Household Spending (SHS) and additional data sources used to derive the CPI basket weights are all subject to both sampling and non-sampling error.¹¹⁴ Statistical errors in the CPI basket weights can have an important effect on measured price change for aggregate price indices in the short run. However, empirical studies suggest variations in the basket weights are unlikely to have a big impact on the calculation of the All-items CPI over longer periods of time.¹¹⁵
- 9.22 The other potential source of error with respect to the basket weights is referred to as upper-level substitution bias. This bias arises because of the use of the Lowe formula, which is an asymmetrically weighted fixed-basket price index. Because the weights are obtained from a year that precedes the price reference period, the expenditures are not likely to be fully representative of consumer spending patterns in the price observation periods. This is because consumers tend to adjust their spending habits in response to changes in relative prices, buying more of the products whose prices have fallen or risen less rapidly, while reducing their purchases of products whose prices have increased the most. In other words, they substitute towards relatively cheaper products from relatively more expensive ones. The asymmetrically weighted fixed-basket formula of the CPI does not account for these types of changes in consumer spending until a basket update is performed.
- 9.23 Unlike the Lowe formula, there are five known symmetrically weighted price index formulae¹¹⁶ which are theoretically free from upper level substitution bias. These index formulae use expenditures from both the price reference period 0 and the price observation period t and therefore account for product substitutions that consumers may make. In this regard they are representative of consumer spending for the periods in which price change is being calculated.
- 9.24 While it would be preferable to calculate the CPI using a symmetrically weighted price index formula, current period expenditure weights are not available to support a timely production of the CPI. The non-revision policy¹¹⁷ of the CPI also does not facilitate the use of forecasted current period expenditures in the calculation of the official CPI.
- 9.25 While maintaining the use of the Lowe formula, steps are taken to reduce the upper level substitution bias by updating the expenditure weights frequently and implementing them with minimal time lag. Statistics Canada took a major step forward in this regard when it switched from a four-year basket update cycle to a two-year cycle and implemented the 2011 basket with the release of the February 2013 CPI. In addition, the lag with which the new basket was implemented was reduced from 18 months to 15 months.¹¹⁸
- 9.26 Upper-level substitution bias in the CPI can be estimated "after the fact" for past periods by comparing the results of the official CPI calculated with the Lowe formula to those calculated using one of the five symmetrically weighted indices, once the expenditures data become available.¹¹⁹

114. The Consumer Price Index basket weights are discussed in Chapter 8.

115. Chiru (2005).

116. The symmetrically weighted price index formulae are: Fisher, Törnqvist-Theil, Walsh, Drobisch and Marshall-Edgeworth. The results of these indices tend to be extremely close to one another as shown in Huang *et al.* (2013). Some of these formulae are shown in Appendix A.

117. The availability and non-revision policy of the Consumer Price Index are discussed in Chapter 2.

118. A chronology of basket updates of the Consumer Price Index is discussed in Chapter 11 and displayed in Appendix C.

119. Huang *et al.* (2013).

Chapter 10 Treatment of Owned Accommodation and Seasonal Products

Concepts Surrounding the Treatment of Owned Accommodation

- 10.1 The treatment of owned accommodation is one of the most difficult problems encountered when constructing consumer price indices. There is probably no other component that is treated in so many different ways by statistical agencies of various countries. The different treatments are in response to both the complex nature of homeownership, which creates problems in identifying and measuring price changes associated with homeownership, and the diversity of users' requirements with respect to the Consumer Price Index (CPI).¹²⁰
- 10.2 Conceptually, an owner-occupied dwelling may be regarded as either a capital good or a consumer good, or both. Statistical agencies that adopt the former view exclude owned accommodation from their consumer price indices. In other words, no effect of price changes associated with the cost of purchasing and using owned accommodation is reflected in the CPI.
- 10.3 Agencies that regard owner-occupied dwellings as consumer goods have several options. One approach is to treat owner-occupied dwellings the same way other durable goods are treated in the CPI, that is, by using the value of net purchases of dwellings in a specified year to derive the basket weight of the index and purchase prices of dwellings to measure price changes for the owned accommodation component.
- 10.4 A second approach is to take into account the shelter services that are provided by owned accommodation. Since these services, in themselves, are not objects of market transactions, their price movement can only be imputed from other series, such as the rent price index. When this rental equivalence approach is strictly applied, the basket weight assigned to the owned accommodation component is based on the estimated rental value of owner-occupied dwellings. The rental equivalence approach has the merit of being consistent with the conventional treatment of owned accommodation in the "Personal expenditure on consumer goods and services" component of the Canadian System of National Accounts (CSNA).¹²¹
- 10.5 Thirdly, the statistical agencies of several countries represent the price movement of the services provided by owner-occupied dwellings with indicators that estimate the effect of price changes on the cost of using dwellings. However, not all countries use the same cost elements. When this user cost approach is applied, the basket weight assigned to owned accommodation is derived from actual or imputed cost elements (imputations may be made for unobserved costs such as the forgone interest on the homeowner's capital invested in the dwelling). Some countries decline to include any imputed cost components in the owned accommodation index. Only expenses involving actual cash disbursements are thus included, so this approach is referred to as a money outlays variant of the user cost approach.
- 10.6 The owned accommodation component seems to be a good illustration of the truism that no single series of consumer price indices can serve well all purposes for which the CPI is commonly used. For example, the rental equivalence approach is fully satisfactory when indices are to be used for deflating the current dollar series within the "Personal expenditure on consumer goods and services" component of the CSNA. This is because the estimated rental value of owner-occupied dwellings is conventionally included in that statistical program. Similarly, if a consumer price index is intended to measure retail price changes, then the movement of current prices of dwellings (and possibly, the movement of current mortgage interest rates) ought to be reflected in the index of owned accommodation.

120. Baldwin *et al.* (2009).

121. Statistics Canada (2008).

10.7 Neither of these approaches, however, seems to be particularly suitable for measuring the effect of price changes on the purchasing power of the consumer dollar. The use of the rental equivalence approach for this purpose is questionable, because the purchasing power of homeowners is neither directly dependent on rent changes nor is it necessarily correlated with these changes, especially in the short-to-medium term. The use of current changes in dwelling prices is not appropriate for the above purpose either, because most homeowners continue to pay for their dwellings during many years after the purchase. Accordingly, the purchasing power of homeowners at any time is affected by price levels in the dwelling's purchase year, rather than just by those in the current year.

Treatment of Owned Accommodation in the Consumer Price Index

10.8 The treatment of owned accommodation in the CPI does not truly conform to the basic definition of the CPI as a price index associated with a fixed-basket of products purchased by the target population. Moreover, owned accommodation is not treated in the CPI in the same manner as other durable goods. This special treatment is justified by the fact that owner-occupied dwellings have, in general, much longer useful lives, higher values and more complicated terms of payment than other durable goods. Although these differences are of a quantitative rather than of a qualitative nature, they are important enough to be taken into account in the computation of the CPI. For instance, mortgage credit is generally considered to be an integral part of purchasing a home, so it would not be ideal to disregard the effect of changing mortgage interest costs on the overall shelter price index. In addition, since mortgage payments for purchased dwellings are spread over many years, it is desirable to take into account not only their current, but also their previous prices in order to produce an appropriate indicator of price-induced changes in the purchasing power of the consumer dollar. These problems seem to affect other durable goods, including high-value goods such as automobiles, to a lesser extent.

10.9 The treatment of owned accommodation in the CPI follows neither the money outlays approach nor the opportunity cost approach. The owned accommodation index is not a money outlays index because of its replacement cost component, depreciation being an imputed cost rather than an actual expense. The owned accommodation index is not consistent, either, with an opportunity cost approach because it excludes other imputed elements that are generally regarded as part of the opportunity cost, such as forgone interest on invested capital and capital appreciation.

10.10 It follows that the solution to the treatment of owned accommodation is a matter of determining the principal purpose(s) that the CPI is designed to serve. There are several, sometimes competing, uses of the CPI.¹²² As with the rest of the index, the approach taken with respect to owned accommodation must attempt to find balance between the purposes for which it serves. The treatment of owned accommodation in the CPI serves well the purpose of providing an adequate indicator of price-induced changes in the purchasing power of the consumer dollar. In particular, it is meant to measure the impact of price changes on a selection of costs specific to homeowners.

122. The uses of the Consumer Price Index are discussed in Chapter 2.

10.11 The price index for the owned accommodation aggregate class, like those for other CPI classes, is calculated as a weighted average of elementary indices. Each elementary index represents the price movement for a given element of homeowners' costs. These costs relate to the stock of dwellings that is identical or equivalent to the stock actually owned by the target population at the end of the basket reference period. Thus, the indices for owned accommodation measure price-induced changes in the cost of using a fixed stock of dwellings, while, for other CPI classes, they measure price-induced changes in the cost of buying a fixed basket of goods and services. Six homeowners' costs are included as elementary indices under the owned accommodation aggregate class:

- mortgage interest cost
- replacement cost
- property taxes
- homeowners' home and mortgage insurance
- homeowners' maintenance and repairs
- other owned accommodation expenses

10.12 Basket weights for these cost elements, except for replacement cost, have been derived from household expenditures reported in the Survey of Household Spending (SHS) for the basket reference period. The basket weight for replacement cost, considered equal to the annual depreciation of the stock of owner-occupied dwellings, is estimated to be 1.5% of the estimated market value of this stock at the end of 2013.¹²³

10.13 The **mortgage interest cost** index is intended to measure price-induced changes in the amount of mortgage interest owed by the target population. There are two price factors that contribute to these changes through time. First, changes in dwelling prices affect the initial amount of debt; hence they also affect the amount of principal outstanding in subsequent periods. Second, given the amount of principal outstanding, the amount of mortgage interest payments is determined by changes in the price of credit (that is, mortgage interest rates). Consequently, the mortgage interest cost index (with the price observation period t and the price reference period 0) is defined as a product of two indices (10.1).

$$M^{0t} = H^{0t} \times I^{0t} \quad (10.1)$$

Where:

H^{0t} is an index that estimates the effect of changes in dwelling prices on the amount of principal outstanding, assuming a fixed stock of mortgaged dwellings and constant conditions of their financing; and

I^{0t} is an index that estimates the effect of changes in interest rates on the amount of mortgage interest owed, assuming a fixed amount of principal outstanding.

123. The value of land is not included in the Consumer Price Index basket weight for replacement cost. The rationale for using the 1.5% rate can be found in Kostenbauer (2001).

- 10.14 The index $H^{0,t}$ is derived by comparing the average level of dwelling prices in the 25-year interval prior to the price observation period (t) of the index with the average level of dwelling prices in the 25-year interval prior to the price reference period (0).¹²⁴ The procedure is based on the assumption that the dwelling price at the time the debt was initially contracted affects the amount of principal outstanding at any given time. Hence, the total amount of principal currently outstanding for the population of homeowners depends on dwelling prices from all the past periods in which their mortgages were initiated. The index of the effect of dwelling prices reflects this assumption, although with some further qualifications.
- 10.15 Prices from various past periods do not equally affect the current total amount of principal outstanding. Dwelling prices from remote periods normally have less influence than do prices from more recent periods because, in general, the older the mortgage the larger the proportion of debt that has already been paid off. This pattern is evident in the distribution of principal outstanding by mortgage age, derived from household expenditure data estimated in the SHS. The pattern is reflected in the index by using weights inferred from this distribution. They decrease with the age of the mortgage, giving less importance to dwelling prices from earlier periods.
- 10.16 The actual distribution of principal outstanding by mortgage age, however, depends not only on this general rule of decreasing importance, but also on various conditions prevailing in specific past periods such as the price level of dwellings, the volume and quality of the stock of dwellings mortgaged and the conditions of mortgage financing.¹²⁵
- 10.17 The effect of varying price levels is removed by converting the amounts of principal outstanding reported in the basket reference period to the basket reference period price level, whatever the period of mortgage initiation. The resulting figures represent the unpaid portions of the dwelling stock that were initially mortgaged in those past periods, expressed in volume (quantitative) terms. This price-corrected distribution, after further smoothing to remove the effect of other irregular factors, is used as a model to derive weights assigned to mortgages of various ages.¹²⁶

124. The New Housing Price Index is the source of data on dwelling price movements that has been used in the Consumer Price Index since 1970. The index is published in Statistics Canada. *Capital Expenditure Price Statistics*, Catalogue No. 62-007, Quarterly. The prices used for these series are contractors' selling prices for new dwellings (including land), collected from builders in more than twenty cities.

125. To eliminate the effect of irregular and cyclical variations, the weights used in the index are based on a model distribution of principal outstanding by mortgage age, rather than on the basket reference year distribution.

126. Separate models were established for five regions of Canada. They were derived from the actual 2013 distributions of principal outstanding by year of dwelling purchase, assumed to be the same as the year of mortgage initiation. Mortgages older than 25 years were eliminated because their number proved to be very small. Next, the amounts of principal outstanding reported in the 2013 Survey of Household Spending (SHS) as initiated in a given year, were converted from the price level in the mortgage initiation year to that in 2013. This was done by means of the New Housing Price Index series (including land). Then, these constant dollar values were adjusted to a semi-logarithmic function of mortgage age, expressed in years. The function provides a good approximation of the actual 2013 distributions, while eliminating the effects of cyclical and irregular variations. Finally, monthly values were interpolated from the adjusted annual values. They are assigned as weights to the level of dwelling prices from the month that precedes the observed period or the base period of the index by the mortgage age figure in the model.

10.18 Due to this design, the variation of the index $H^{0,t}$ which estimates the effect of changes in dwelling prices is not affected by non-price factors such as changes in the volume and quality of the stock of mortgaged dwellings or in the proportion of debt that is paid off on mortgages of equal age. The index represents a special case of a fixed-basket price index, which may be presented as follows (10.2).¹²⁷

$$H^{0,t} = \frac{\frac{\sum_{g=1}^{300} \bar{p}^{t-g} \times q_g}{\sum_{g=1}^{300} q_g}}{\frac{\sum_{g=1}^{300} \bar{p}^{0-g} \times q_g}{\sum_{g=1}^{300} q_g}} = \frac{\sum_{g=1}^{300} \bar{p}^{t-g} \times q_g}{\sum_{g=1}^{300} \bar{p}^{0-g} \times q_g} \quad (10.2)$$

Where:

g is the age of the mortgage debt, between 1 and 300 months (25 years), counted from the time of the initial mortgage contract to the price reference period 0;

\bar{p}^{t-g} and \bar{p}^{0-g} are the average dwelling price levels in periods $t-g$ and $0-g$, respectively, for a stock of dwellings that is equivalent to that with mortgages of age g in the model distribution; and

q_g is the implicit stock of mortgaged portions of dwellings with loans of age g , estimated according to the model distribution and expressed in volume terms.

10.19 The index $I^{0,t}$ is derived from a standardized function of mortgage interest cost, by comparing its values in the price observation period (t) and in the price reference period (0). The function is standardized by assessing the mortgage interest cost with respect to a constant amount of principal outstanding. Due to this property, the function varies only with the effect of interest rates.

10.20 It is assumed that the amount of mortgage interest cost at any given time depends on interest rates at the time when the current mortgage agreement was contracted. Hence, it is only through new and renegotiated mortgage contracts that the current interest rates affect the amount of mortgage interest currently owed by the population of homeowners. The standardized mortgage interest cost function reflects this assumption by simulating the initiation and renegotiation of mortgages.

10.21 The first value of the standardized mortgage cost function was calculated for the basket reference period. It was inferred from data reported by homeowners on principal outstanding at the end of the basket reference year and on interest rates applicable to their mortgages during consecutive months of that year. In addition, the above amounts of principal outstanding at the end of the basket reference year and the standardized amounts of mortgage interest cost inferred for that month were grouped by the expiration month of the mortgage contracts, again as reported in the SHS of the basket reference year.

127. This formula, though, is not strictly followed in the actual index computation. It is replaced in practice by an equivalent procedure comparing (dividing) two weighted averages of dwelling price indices, all of which are on the 2013 index time base, that cover a 25-year interval prior to the observed and base periods of the index.

- 10.22** For any observed month subsequent to the basket reference year, the standardized mortgage cost function is derived in a recursive way, from figures already established for the preceding month. The initiation and renegotiation of mortgages in the month preceding the observed one are first simulated. The amount of principal outstanding that is assumed to have been entirely paid off¹²⁸ is reintroduced to represent the newly created mortgages. Also, the amount of principal corresponding to contracts that are assumed to have expired is reintroduced to represent the renegotiated mortgages. New mortgage terms¹²⁹ and current interest rates¹³⁰ are then applied to those two amounts of principal outstanding. In this way, the standardized mortgage interest cost for the observed price reference month is estimated on mortgages that are assumed to have been created and renegotiated in the preceding month.
- 10.23** For the remaining mortgages whose contracts are considered to be unchanged, the standardized mortgage interest cost is simply carried over from the preceding month. This completes the estimation of the standardized mortgage interest cost function for the observed month. The standardized mortgage cost function can be presented by the following, recursive formula (10.3).

$$A^t = A_{old}^{t-1} + \sum_{1,3,5} \left[(B_{new}^{t-1} + B_{renew}^{t-1}) \times f_{(1,3,5)} \right] \times r_{1,3,5}^{t-1} \quad (10.3)$$

Where:

A^t is the amount of the standardized mortgage interest cost in the price observation period t , estimated with respect to all mortgages;

A_{old}^{t-1} is the amount of the standardized mortgage interest cost in the period $t-1$, estimated with respect to the mortgages that did not change (not newly initiated or up for renewal);

$(B_{new}^{t-1} + B_{renew}^{t-1})$ is the total amount of principal outstanding in period $t-1$, estimated with respect to the mortgages newly initiated and renewed;

$f_{(1,3,5)}$ is the fraction of principal outstanding that represents contracts with 1,3,5 year terms among newly created and renewed mortgages; and

$r_{1,3,5}^{t-1}$ is the current mortgage interest rate in period $t-1$ for contracts of 1, 3 and 5 year terms.

- 10.24** The replacement cost index relates to that portion of owner-occupied dwellings that is assumed to be consumed. This is represented by the worn-out structural portion of housing (depreciation of housing) or the amount a homeowner must spend to maintain the home's market value. The price index for replacement cost is derived by taking the total value of homes owned in Canada at the end of the basket reference year and adjusting the total each month by changes in house prices as reflected by the New Housing Price Index,¹³¹ exclusive of land.

128. It corresponds to the fraction of mortgages one month old in the model distribution of principal outstanding by mortgage age, described above.

129. Three popular mortgage terms of one, three and five years are assigned, following the distribution of the principal outstanding by terms in the 2013 Survey of Household Spending (SHS). The terms are also used to assign the expiration dates to newly created and renegotiated mortgages. Due to this, the standardized cost function and the index of the effect of interest rates can continue beyond the expiration dates reported in the 2013 SHS.

130. Canada Mortgage and Housing Corporation (CMHC) provides data on monthly average interest rates, for mortgages with the terms of one, three and five years.

131. Statistics Canada Survey number [2310](#).

- 10.25** The **property tax index** measures changes through time in the amount of taxes levied on a constant **sample** of dwellings in selected municipalities. This sample of property taxes paid, obtained from administrative sources, is used to obtain an estimate of the average property tax by city. This enters as the price in the current and previous periods' **unit value index** calculation.¹³² Changes in property taxes are reflected once a year, in the October CPI.
- 10.26** The **homeowners' home and mortgage insurance index** measures changes through time in the cost of insuring a fixed stock of dwellings against a specified combination of perils. This cost varies not only with changes in insurance rates for given property values, but also with changes in the values of the properties covered which result from movements in dwelling prices. Consequently, the insurance index is estimated by multiplying the following two indices:
- 10.26.1** One that measures the change in the value of the replacement cost of properties using a third-party insurance data base (estimated quarterly); and
 - 10.26.2** One that measures the change in insurance rates by comparing the cost of identical policy profiles using data from insurance companies in the sample.
- 10.27** The elementary indices for Homeowners' maintenance and repairs as well as Other owned accommodation expenses are estimated using the standard approach for calculating **elementary price indices**.¹³³

Treatment of Seasonal Products

- 10.28** The use of the fixed-basket concept to construct consumer price indices creates difficulties when the actual consumption pattern in the price observation period differs markedly from that of the basket reference period. In the case of monthly indices, problems may arise due to the seasonality of the quantities consumed of many goods and services. Some products are subject to seasonal variations in their supply. These include various services, such as golf memberships or downhill ski lift tickets that are only available for a few months every year. Other products are subject to seasonal variations in demand. These include many articles of clothing, such as bathing suits and winter coats. Whatever the cause, any good or service that experiences seasonal fluctuations in its quantity purchased should be considered a **seasonal product**.
- 10.29** The CPI is based on a fixed-basket, constructed from consumer expenditure data for one year. The representativeness of an annual **fixed-basket index** in any one particular month is adversely affected if seasonal products are part of the basket. In a fixed-basket index, a seasonal good or service will have the same quantity weight in the basket for all months of the year. That quantity will be inappropriately small in the product's in-season months and inappropriately large in its off-season months. For example, golf membership will be under-weighted in June's CPI, and over-weighted in December's.
- 10.30** The treatment of seasonal goods and services is a contentious issue. One effective way of dealing with seasonal products in a fixed-basket index with weights from a calendar year is to avoid the inclusion of highly seasonal products in the sample, that is goods or services for which quantity consumed would fall to zero in any particular month(s) of the year. For example, rather than including golf memberships which are unavailable in the winter months, instead the CPI could measure price change of indoor rock climbing passes which are available all year round.

132. The unit value calculation is discussed in Chapter 6.

133. The standard approach for calculating elementary price indices in the Consumer Price Index is discussed in Chapter 6.

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- 10.31 The main problem with this approach is that it may diminish the representativeness of certain indices in certain months. For example, while the CPI aims to measure price change for all in-scope consumer products, it must inevitably be based on a sample of product offers (POs) for a relatively small number of representative products¹³⁴ that are considered to be representative of all goods and services within a particular elementary aggregate. The problem appears if the price movements of the all-year product, such as indoor rock climbing passes, are not representative of the price movements of all products included in the elementary aggregate. This can become particularly problematic in a country with very distinct seasons, such as Canada, where seasonal products may make up a large proportion of consumer spending. Not including the price movements of seasonal items could lead to some elementary price indices being unrepresentative of price change experienced by the target population for that expenditure category.
- 10.32 Another option for dealing with the challenges associated with seasonal products is to have separate fixed-quantity baskets for all months of the calendar year (seasonal baskets). That is, to calculate the January index using only the quantities consumed in January, the February index using only the quantities consumed in February, and so forth. Then a seasonal product would have an appropriate quantity weight in every month's index of the year. Annual indices for seasonal products would be calculated as weighted averages of monthly indices so in-season months would be more heavily weighted than off-season months in calculating the annual price movement. If a good or service was a seasonally disappearing product, it would not be part of the basket in a month when it is not available in the market.
- 10.33 The major disadvantage of an index with seasonal baskets is that it does not provide a measure of pure price change for intra-annual price movements, such as quarterly or monthly changes. First, consider the fixed-basket index with calendar year weights. If the price of every collected PO showed no change in a given month, the index would also show no change. Additionally, if the prices of some collected POs in this fixed-basket index change in a given month, the percentage change of the All-items CPI (or another aggregate index) will lie between the minimum and maximum percentage changes of the corresponding sub-indices. By contrast, if the price of every PO in an index with seasonal baskets showed no price change from month to month, that index may still register an increase or a decrease due to changes in the quantities of the monthly seasonal baskets. Additionally, the monthly percentage change of an All-items CPI (or another aggregate index) with seasonal baskets could sometimes stray outside the minimum and maximum percentage changes of its respective sub-indices.
- 10.34 Finally, the determination of seasonal basket weights, like all basket weights, is based on consumption patterns from periods in the past and consequently would not take into account abnormal seasonal fluctuations in current periods. For instance if bad weather conditions in the current period were to impact certain fruit or vegetable crops thereby delaying their availability in the market, seasonal baskets based on past expenditure periods would not account for this.
- 10.35 The CPI has used two methodologies to deal with seasonal products. From 1961 to April 1973 the CPI series for seasonal food products were based on seasonal-basket formulae.¹³⁵ From April 1973 forward all aggregate price indices are calculated using a fixed-basket Lowe price index formula with calendar year weights. Price movements for highly seasonal products are imputed in their out-of-season periods.

134. The Consumer Price Index price sample is described as small relative to the enormous number of consumer products available. Available resources and other operational and conceptual challenges make it impossible to collect prices for all products bought by Canadian consumers. Furthermore, it is not necessary to sample all products bought by consumers if a representative sample of prices is drawn. The sample strategy for the CPI is discussed in Chapter 5.

135. Statistics Canada (1987).

- 10.36** In the current CPI practice, highly seasonal products are identified as such and in the months when their quantity purchased is believed to approximate zero, their price movements are imputed. Examples of products identified as highly seasonal include gas barbeques, lawn mowers, winter jackets and boats. Out-of-season imputations are done at the level of elementary aggregates. The imputed price movement is taken from the aggregate class that is located above the out-of season product in the CPI classification.
- 10.37** In the months when indices for out-of-season products are imputed, the price movement for the aggregate index would be exactly the same as if the seasonal product were not part of the basket. Essentially, the basket weights of out-of-season goods and services are redistributed among the remaining in-season products so in this respect, out-of-season- imputation, although carried out within the parameters of a fixed-basket index with calendar year weights, gives results similar to the seasonal-basket approach.
- 10.38** Imputing prices for out-of-season products also helps dampen sharp movements in the index that can occur when moving from one season to the next. This is because the price movement of the product is extrapolated over the out-of-season period rather than being treated as posting no price change. The extent to which out-of-season imputations reduce inter-seasonal shifts in the index depends on the correlation between the price movement of the highly seasonal products and the price movement of the aggregate class that is the source of the imputation.
- 10.39** It should be clearly understood that the objective of out-of-season- imputation is not to obtain a proxy index that mirrors the price behavior of the seasonal product in its out-of-season months. In many cases, the true price movements of products in their out-of-season months are quite volatile as they are not subject to predictable changes in supply or demand.

Seasonal Adjustment of Price Indices

- 10.40** Month to month movements in the CPI can sometimes be the result of seasonal price changes. For example, between January and March travel packages typically see price increases as more people tend to travel out of the country in the winter and over the March break. While these price changes are valid, in that consumers often experience higher prices for travel tours in the winter months, they are part of a usual pattern of price increases brought on by raised demand. They are likely to be reversed when demand weakens again. Accordingly, for some purposes these price changes might not be interpreted as consumer price inflation. The practice of seasonal adjustment is used to isolate and then remove seasonal price movements from indices to get a better picture of "true" or "underlying" consumer price inflation in the economy.¹³⁶
- 10.41** Statistics Canada uses the statistical program X12 ARIMA to seasonally adjust the All-items CPI and 12 other aggregate indices at the Canada level.¹³⁷ Each month the current index is seasonally adjusted and at the same time the previous month's seasonally adjusted index is open to revision. Additionally, each January the last 36 months of seasonally adjusted data are reviewed and revised if necessary.

136. While there is no exact definition of "true" or "underlying" price inflation, many economists assert that typical seasonal fluctuations in consumer prices should not be regarded as inflation because when contained within an annual period, they are neutral.

137. The 12 other aggregate price indices seasonally adjusted each month include: the eight major aggregates (Food; Shelter; Household operations, furnishings and equipment; Clothing and footwear; Transportation; Health and personal care; Recreation, education and reading; and Alcoholic beverages and tobacco products); the Core Consumer Price Index (CPI) (Bank of Canada's definition); the All-items CPI excluding eight of the most volatile components (Bank of Canada's definition); the All-items CPI excluding food; and the All-items CPI excluding food and energy.

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- 10.42** Statistics Canada does not seasonally adjust every CPI series. The headline CPI figure is an unadjusted estimate. This is due, in part, to the fact that many users consider the year-over-year percentage change in the All-items CPI to be a good general indicator of consumer price inflation. Year-over-year changes, by their very construction, neutralize seasonal movements and do not require seasonal adjustment.
- 10.43** The other reason for the limited production of seasonally adjusted CPI data is the properties of the index aggregation formula (Lowe) used to compile the upper level of the CPI. To counteract the potential for residual seasonality in aggregate indices, Statistics Canada employs a direct or independent seasonal adjustment method, meaning that seasonally adjusted CPI series are not derived from their respective seasonally adjusted sub-indices. While this practice reduces the likelihood of having residual seasonality in the series, it also poses a few challenges when using the seasonally adjusted CPI data. First, direct seasonal adjustment prevents consistency in aggregation. Since the All-items CPI is adjusted independently of the eight major aggregates, its movements can be inconsistent with those of its component indices. Second, by directly seasonally adjusting the All-items CPI and major components, the capacity to analyze or interpret contributions to percentage change is lost.
- 10.44** Despite the challenges with seasonally adjusted price indices, seasonal adjustment provides many useful benefits to users of price indices.¹³⁸

138. Wyman (2010).

Chapter 11 History

- 11.1 The Consumer Price Index (CPI) began with a study conducted by the Department of Labour in the early 1900s. The study was based on a hypothetical family budget that represented weekly expenditures of an urban working man's family of five. Retail prices for 29 food products and 5 fuel and lighting products were collected in approximately 60 cities. In addition, information was obtained on the rent for a representative workingman's six-roomed dwelling. Using these data, indices on a 1900 index base period were calculated for Canada and the provinces. The calculation of these indices continued until August 1940.
- 11.2 The Department of Labour also started producing a "Cost-of-Living Index"¹³⁹ on a 1913 index base period, with component indices for food, fuel and lighting, rent, clothing and sundries. This index was published for June and December from 1914 to 1917, for April, June, September and December from 1918 to 1926 and monthly from 1927 onward. An attempt was made to weight product classes according to their actual importance in wage-earners' spending, even though no extensive household expenditure survey had been undertaken.
- 11.3 The first index of retail prices produced by the Dominion Bureau of Statistics also had a 1913 index base period. This index was calculated using prices from the Department of Labour series as well as some prices obtained directly from retailers. Basket weights used in the index were based on estimates of the total Canadian consumption of each product in 1913. The index was subsequently updated and produced on a 1926 index base period. Although the weighting system of the updated index was more refined, it was still based on the estimated total consumption in Canada. The number of product prices collected increased substantially at this time.
- 11.4 The index was again updated in 1940 and published on a 1935-39 index base period. The basket weights used in this index were derived from a 1938 Family Expenditure Survey (FAMEX) for urban wage-earner families with annual incomes between \$450 and \$2,500. The 1940 update showed that the Bureau had come to accept the Department of Labour's view that the index should measure price changes experienced by a well-defined demographic group.
- 11.5 Until 1940 the CPI was a direct Laspeyres¹⁴⁰ index for its entire or more recent estimation period. Any index can be calculated as a Laspeyres index when it is initiated and until the 1947-48 basket update in 1949, it was considered acceptable to revise the CPI backward for several years at the time of a basket update.¹⁴¹
- 11.6 A subsequent FAMEX covering the period 1947-48 provided the basis for the next thorough basket update of the index in 1952. At that time, 1949 became the index base period and the title was changed from "Cost-of-Living Index" to "Consumer Price Index (CPI)".¹⁴² The CPI was defined as "a measure of the percentage change through time in the cost of purchasing a fixed basket of goods and services representing the consumption of a particular population group during a given period of time". This definition remains in essence unaltered to this day.

139. Despite the original name, "Cost-of-living-index", the concepts and methodologies used to construct the index never truly conformed to the cost-of-living framework as understood today. Even under its original name, the index was closely tied to the concept of measuring a fixed basket of goods and services bought by a target population.

140. The index compared prices in a current period t to the price reference period 0 , directly rather than via chained-monthly indices as the index is computed today. The methods for computing the Consumer Price Index are discussed in Chapter 6.

141. This past practice of revising backward at the time of a basket update is contrary to the current no revision policy. The adoption of a no revision policy highlighted the importance of the Consumer Price Index as a tool in adjusting wages and/or other contractual payments.

142. The original title was inadequate because it led users to believe that the Consumer Price Index was a measure of all changes in living costs which the index was never designed to do.

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- 11.7 Soon after that update, a series of small-scale biennial surveys of family expenditures were undertaken and their results were used to choose the dates of subsequent CPI basket updates. The changes in family expenditure patterns shown by the 1957, 1967 and 1974 surveys were deemed sufficiently important to justify the implementation of new baskets in January 1961, May 1973 and October 1978, respectively.
- 11.8 Several important changes were introduced with the 1974 basket. In particular, family size and income constraints were removed, thus broadening the target population. Also, with the updating of the 1974 basket the national indices began to be calculated as weighted averages of the corresponding indices for 59 urban centres. In addition, the New Housing Price Index replaced the Residential Building Construction Input Price Index in the CPI series measuring homeowners' replacement cost, mortgage interest cost and homeowners' home and mortgage insurance.
- 11.9 Following the adoption of the 1974 basket in the CPI, a policy of regular updating was established, with the updates tied to a four-year cycle of major FAMEX surveys. The 1978 basket was thus incorporated in April 1982, the 1982 basket in January 1985, and the 1986 basket in January 1989. The time lag between the basket reference period and the implementation of the basket was gradually reduced.
- 11.10 There was a six-year interval between the 1986 and the 1992 baskets, longer than the regular four-year interval. The introduction of the 1992 basket was postponed by two years to ensure it would reflect adjustments to consumption patterns resulting from the introduction of the Goods and Services Tax (GST) and from the removal of the Federal Sales Tax in January 1991. However, the time lag between the basket reference year and basket implementation remained 24 months for the 1992 basket, which was implemented with the January 1995 update.
- 11.11 The 1996 basket was introduced with the January 1998 update and was the last basket update that was based on FAMEX data as the survey was subsequently discontinued. The three-year lag between the introduction of the 1996 basket and the introduction of the previous basket was at the time a record for the CPI.
- 11.12 There was a five-year lag between the 1996 and 2001 baskets, although the basket was introduced with the January 2003 update, matching the record of the 1996 basket update's record for the shortest lag between the end of the basket reference year and the month of implementation. The FAMEX survey was replaced in 1997 with an annual Survey of Household Spending (SHS). Starting with 1999, the SHS estimates were calculated for the provinces and territories in odd-numbered years and for the provinces only in even-numbered years. Since the CPI includes the territorial capitals Yellowknife, Whitehorse and Iqaluit as geographical strata, the year 2000 was precluded as a basket reference year. Budget problems and concerns about year 2000 bugs in computer software also contributed to the choice of 2001 for the basket update.
- 11.13 The 2005 and 2009 basket updates marked a return to a four year interval between baskets but also a lengthening in the implementation lag: the baskets were implemented in May 2007 and May 2011 respectively.
- 11.14 The 2011 basket marked the first-ever two-year interval between basket updates for the CPI. It also marked a reduction in the implementation lag to 14 months after the basket reference period, since the new basket was introduced in March 2013.

11.15 Whenever a basket update takes place, the concepts and the procedures used to calculate the CPI are reviewed and revised when necessary. The CPI index base period has also been periodically changed. While not required to be implemented at the time of a basket update, for operational reasons many of the changes to the CPI index base period have taken place alongside the updating of the basket of goods and services. Changes to the index base period have usually related to changes in the base year of the Canadian System of National Accounts.

11.16 A detailed chronological history of all the basket updates for the CPI can be found in Appendix C. It includes the basket reference period; the basket link month; the basket end month; the first month published with the new basket; any major revisions made at the time of the basket update; changes to the target population and/or geographical coverage; the introduction of new products into the basket or sample; as well as notable changes that were made to the classifications, scope or methodologies.

Glossary

The glossary contains terms that are pertinent to price index theory and the construction of the Canadian Consumer Price Index (CPI). The section referred to in the third column is where the given term is used and explained in a broader context.

Term	Description	Section
Acceleration	A larger (faster) rate of change of an index from one period to another. The opposite of deceleration.	2.22
Acquisitions approach	An approach to the timing of price collection corresponding to the period in which the good or service is obtained by the consumer, that is, when the legal ownership of the good passes to the consumer.	3.26-3.29
All-items CPI	The total (highest-level aggregate) in the CPI product classification. The index which is commonly used to calculate "inflation".	2.1
Annual average price indexes	The unweighted arithmetic average of 12 consecutive monthly price indexes from January to December.	2.2
Annual average percentage change	The percentage difference between two consecutive annual average prices indexes.	2.14.3
Asset	An economic resource. Anything capable of being owned or controlled to produce value and that is held to have positive economic value.	3.13
Asymmetrically weighted	Refers to a price index formula where the weights used to aggregate elementary price indexes do not give equal weight to both periods of price comparison. For this reason an asymmetrically weighted price index formula does not represent the spending patterns of consumers over both periods of price comparison and is therefore subject to substitution bias. The Laspeyres, Lowe and Paasche formulae are asymmetrically weighted price indexes.	9.22
Basic class (aggregate)	The lowest level in the intersection of the product and geography classifications at which the quantity weights are kept fixed for the duration of the basket. This is also the lowest level in which indexes are typically published for the CPI.	4.9
Basket update	The process of replacing a basket (fixed-quantity weights) by another one that is more recent.	8.6 8.10-8.12
Basket weight	Expenditures from a given reference period used to estimate quantities consumed for upper level aggregation of elementary price indexes.	8.1-8.6
Bestsellers method	A common method for estimating price change for goods that are highly 'fashionable' and have high intangible content that consumers value. The price estimation method currently used for the Books and other printed matter (excluding textbooks) elementary index in the CPI.	1.18 5.30
Bias	Errors which are systematic, meaning they lead to persistent over-or under-estimation of the phenomenon being measured.	9.2

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Term	Description	Section
Capital good	A durable good that is also an asset.	1.51, 10.2
Chain-linked index	An index spanning more than one basket that has been calculated using the chain-linking procedure.	8.21
Chain-linking	The process of chaining a fixed-basket index to another fixed-basket index in order to create a continuous time series. This process ensures that period-over-period percentage changes in a chain-linked index will only reflect price change and not changes in the fixed quantities.	8.14-8.21
Classification	An exhaustive and mutually exclusive structure for categorizing a domain. In the CPI, classifications are used primarily for the product and geography domains. They are used for weighting and aggregating elementary prices indexes and also serve as a basis for stratifying the sample of prices collected.	1.12 4.1-4.9
Collection area	A geographical sampling unit. For the CPI it corresponds to a Census Sub-Division and is similar to a "municipality".	5.6
Composite price index	An index designed to express, in one number, average price change for multiple products and/or geographies.	2.11, 8.23
Computer-Assisted Personal Interview (CAPI)	A survey approach where interviewers ask questions guided by a computer screen and enter the responses into the computer, where those answers are checked for consistency and from which the encrypted responses are ultimately transmitted to headquarters.	1.21, 5.14
Consumer goods and services	Products purchased for consumption by a household.	10.4
Contributions to percentage change	The percentage points that a change in a component index account for in the percentage change of an aggregate index. It is a tool used by Statistics Canada to understand and summarize movements in the CPI.	2.17-2.23
Cost-of-Living Index (COLI)	An index designed to measure changes in the cost of maintaining a given level of well-being for a group of consumers.	2.30.2
CPI survey frame	A set of units from which a CPI sample is drawn.	5.7-5.11
Cut-off sampling	A survey sampling method in which parts of the universe are excluded from sample selection. The method is used by Statistics Canada in the sampling of prices for various elementary aggregates where only partial frames are available.	5.2-5.26
Deceleration	A smaller (slower) rate of change of an index from one period to another. The opposite of acceleration.	2.22
Direct price comparison	A method used to compare the prices of exiting and entering Product Offers (POs) in the CPI sample when there is no perceptible quality difference. The price of the entering PO is compared directly with the price of the exiting PO and no quality adjustment is made.	7.4-7.6
Durable good	A good that is not fully consumed in a short period of time (roughly one year). It provides services over a long period of time.	3.13

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Term	Description	Section
Economic Region	A standard geographical unit, defined by Statistics Canada, for analysis of regional economic activity which corresponds to a grouping of Census Divisions.	4.3
Eight major aggregates (components)	The highest level of aggregation in the product classification of the CPI below the All-items level.	4.2
Elementary aggregates	The lowest level in the intersection of the product and geographical classifications of the CPI for which expenditure weights are normally available. They consist of similar groupings of products in a geographical stratum. They are the starting point of the upper level aggregation using the fixed-basket Lowe formula.	4.4-4.11
Elementary price indexes	Price indexes corresponding to elementary aggregates. In the CPI they are typically calculated using a Jevons formula.	6.13
Explicit quality adjustment	Various methods of directly adjusting an observed price to account for the estimated quality difference between exiting and entering Product Offers in the CPI sample.	7.7 7.12- 7.13
Fixed-basket index	The ratio of the cost of a specified basket of goods and services in an price observation period to its cost in a previous period. The Dutot, Lowe, Laspeyres, Paasche, Marshall-Edgeworth and Walsh formulae yield fixed-basket price indexes.	2.30.2 6.5 10.30
Geographical stratum	The lowest geographical level in which expenditure weights are used in the construction of the CPI. The geographical strata also serve as sampling areas within which Product Offers are collected for the CPI.	4.3 5.24 6.2
Hedonic quality adjustment	A statistical method for estimating how the price of a Product Offer (PO) is affected by its characteristics. It is a common method used to estimate the effect of quality change on price movement at the time of PO substitution.	7.14
Hybrid expenditures	The value corresponding to the hypothetical cost of an elementary aggregate, in which quantities and prices are derived from different periods. The quantities normally come from the basket reference period and the prices from another period.	6.27 8.1
Imputation	The process of replacing missing data with estimated values. In terms of the CPI it involves estimating the price movement of an elementary aggregate by proxy, using the price movement of a donor class.	5.3 7.8
Index reference period (index base period)	The period in which an index is arbitrarily set equal to 100.	2.11 8.20-8.28
Link month	The month in which a new fixed-basket index is chained to an old fixed-basket index.	8.14-8.20
Link-to-show-no-change	A method which forces a price relative of 1 (no price change) when a new (entering) Product Offer (PO) replaces an old (exiting) PO in the CPI sample.	7.9

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Term	Description	Section
Lower level of calculation	The first stage of CPI calculation, which involves computing price indexes for elementary aggregates. In the case of the CPI this is typically done using a ratio of geometric average prices (Jevons).	6.2
Matched-model	A method for measuring "pure price change" by keeping constant all quality characteristics across time, except for price. This is the standard method for measuring price change in elementary aggregates in the CPI.	6.9 7.1
Money outlays	A variant of the user-cost approach for measuring owned accommodation in a CPI where only expenses involving actual cash disbursements are included.	10.5 10.9
Month-over-month percentage changes	A price change between one month t and the preceding month $t-1$.	2.13.1
Outlet	The interface between a supplier of products and the consumer. It may be a store, a catalogue, a website etc.	5.1-5.15
Overlap pricing	A method of quality adjustment based on the difference in price between exiting and entering Product Offers (POs) when both can be observed simultaneously.	7.7
Plutocratic weights	Expenditure weights in which each household in the target population contributes its own spending to the total spending weight for the target population. The basket weights for the CPI, which are derived primarily from the Survey of Household Spending, follow this approach. Opposite of democratic weights.	8.2
Price observation period	One of the periods for which an index has been compiled. Also widely used to mean the later of the two periods being compared. Appears in the numerator of price ratios. It is typically designated as period t .	2.5
Price reference period	The period that provides the prices to which all other periods are compared. Appears in the denominator of price ratios. It is typically designated as period 0.	6.24-6.32
Price-updating	A procedure whereby the quantities of an earlier period are revalued at the prices of a later period. The result is hybrid expenditure weights. This procedure is necessary in order to hold quantities constant when expenditures (not quantities) are the only source of data available for deriving basket weights.	6.28 8.15
Product Offer (PO)	The presentation of a particular good or service, with an associated price, by a retailer to a purchaser. Used in the CPI as a proxy for the final transaction price paid by consumers.	3.24 5.14
Profiles method	A method for estimating price change for an elementary aggregate where prices for bundles of services (rather than individual products) are compared over time.	5.27 5.29
Pure price change	The change in the price of a product of which the characteristics are unchanged; or the change in the price after adjusting for any change in quality.	7.1-7.2

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Term	Description	Section
Quality adjustment	An adjustment to remove from the observed price change the contribution attributable to changes in a product's characteristics.	1.30 5.21
Rebasing	The process of changing the index reference (base) period. As an arithmetic operation it does not affect the rate of price change between any two index points.	2.12 8.25
Rental equivalence	The estimation of the hypothetical rents that would be payable by owner-occupiers on the basis of market rents payable for renter-occupied accommodation of the same type and location.	10.4
Representative Product (RP)	The definition of a narrow class of products for which the average price change is expected to be representative of the average price change of an elementary aggregate.	1.15 5.4
Sample	A set of data collected to represent a population.	5.1
Sampling unit	An element considered for selection in some stage of survey	5.4
Scope	The set of products and geographies and the target population for which the CPI is intended to measure price changes.	1.7 3.1
Seasonal adjustment	A procedure for removing regular recurring intra-annual fluctuations from a time series in order to reveal its underlying trend, cyclical and irregular movements.	10.40-10.44
Seasonal product	Products that are either not available for purchase during certain periods of the year or are available but subject to regular and significant fluctuations in the quantities available and/or purchased.	10.28
Special aggregate index	An index for different combinations of elementary price indexes, excluding certain product classes. These indexes provide supplementary information on aggregate price change.	2.14
Substitution bias	Generally understood to be the bias that arises from the use of asymmetrically weighted fixed-basket index formulae. Occurs because quantities are held constant while consumers change their purchasing patterns in response to relative price changes.	9.20-9.26
Symmetrically weighted	Refers to a price index formula where the weights used to aggregate elementary price indexes refer to both periods of price comparison. For this reason a symmetrically weighted price index formula represents the spending patterns of consumers over both periods of price comparison and is therefore not subject to substitution bias. The Fisher, Törnqvist-Theil, Walsh and Marshall-Edgeworth formulae are examples of symmetrically weighted price indexes.	9.23-9.26
Target population	The people or group of people whose consumption expenditures are in the scope of the CPI.	3.5
Target Product Offer (TPO)	The specification of a Representative Product (RP) to an outlet. The TPO acts as the sample intention for the CPI.	5.13

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Term	Description	Section
Unit value index	A method for estimating price change for an elementary aggregate where the quantity-weighted average transaction price for homogenous products is compared over time.	6.20
Upper level calculation	The second stage of CPI calculation, which involves aggregating elementary price indexes using a fixed-quantity weighted arithmetic average formula (Lowe).	1.24
User cost	The estimation of the cost of using a fixed asset or durable good. The current approach used in the CPI for owned accommodation.	10.5
Weight (basket) reference period	The period from which the expenditures, used to derive the quantity weights of the CPI basket, are taken.	6.25
Weight adjustment	A procedure to obtain monthly hybrid expenditure weights when annual expenditures are used in the calculation of monthly price indexes.	8.16

Source: Statistics Canada, Consumer Prices Division.

Appendix A Common Price Index Formulae

Common index formulae for elementary price indices (lower level)		
Name	Index formulae	Description
Dutot	$I_{D,a}^{t-t_1} = \frac{\sum_{i=1}^n \frac{1}{n} p_i^t}{\sum_{i=1}^n \frac{1}{n} p_i^{t-1}}$	A price index defined as the ratio of the unweighted arithmetic average of the prices in the current period t to the unweighted arithmetic average of the prices in period $t-1$. See chapter 6, formula 6.3.
Jevons	$I_{J,a}^{t-t_1} = \frac{\prod_{i=1}^n (p_i^t)^{1/n}}{\prod_{i=1}^n (p_i^{t-1})^{1/n}}$	A price index defined as the ratio of the unweighted geometric average of the prices in the current period t to the unweighted geometric average of the prices in period $t-1$. See chapter 6, formula 6.2.
Weighted Jevons	$I_{WJ,a}^{t-t_1} = \frac{\prod_{i=1}^n (p_i^t)^{w_i} / \sum_{i=1}^n w_i}{\prod_{i=1}^n (p_i^{t-1})^{w_i} / \sum_{i=1}^n w_i}$	A price index defined as the ratio of the explicitly weighted geometric average of the prices in the current period t to the explicitly weighted geometric average of the prices in period $t-1$. See chapter 6, formula 6.4.

Appendix A Common Price Index Formulae

Common index formulae for aggregate price indices (upper level)		
Name	Index formulae	Description
Fisher	$I_{F,A}^{0,t} = \left(I_{L,A}^{0,t} \times I_{P,A}^{0,t} \right)^{\frac{1}{2}}$	A price index defined as a geometric average of the Laspeyres price index and the Paasche price index. It is a symmetrically weighted index using quantities of goods and services from both periods 0 and t .
Laspeyres	$I_{L,A}^{0,t} = \frac{\sum_{i=1}^n p_i^t q_i^0}{\sum_{i=1}^n p_i^0 q_i^0}$	A price index defined as an asymmetrically weighted fixed-basket that uses the quantities of goods and services from the base period 0. See chapter 6, formula 6.5.
Lowie	$I_{Lo,A}^{0,t} = \frac{\sum_{i=1}^n p_i^t q_i^b}{\sum_{i=1}^n p_i^0 q_i^b}$	A price index defined as an asymmetrically weighted fixed-basket that uses the quantities of goods and services from the chosen weight reference period b . See chapter 6, formula 6.6.
Marshall-Edgeworth	$I_{ME,A}^{0,t} = \frac{\sum_{i=1}^n p_i^t \times \left[\frac{(q_i^0 + q_i^t)}{2} \right]}{\sum_{i=1}^n p_i^0 \times \left[\frac{(q_i^0 + q_i^t)}{2} \right]}$	A price index defined as the ratio of average weighted prices between period 0 and t with weights as the arithmetic average of quantities from both periods 0 and t . It is a symmetrically weighted fixed-basket index.
Paasche	$I_{P,A}^{0,t} = \frac{\sum_{i=1}^n p_i^t q_i^t}{\sum_{i=1}^n p_i^0 q_i^t}$	A price index defined as an asymmetrically weighted fixed-basket index that uses the quantities of goods and services from the current period t .
Törnqvist-Theil	$I_{T,A}^{0,t} = \prod_{i=1}^n \left(\frac{p_i^t}{p_i^0} \right)^{\frac{1}{2}(s_i^0 + s_i^t)}$ <p>Where</p> $s_i^0 = \frac{p_i^0 q_i^0}{\sum_{i=1}^n p_i^0 q_i^0}$ $s_i^t = \frac{p_i^t q_i^t}{\sum_{i=1}^n p_i^t q_i^t}$	A price index defined as a geometric average of price relatives weighted by the average expenditure shares in both periods 0 and t . It is a symmetrically weighted index.
Walsh	$I_{W,A}^{0,t} = \frac{\sum_{i=1}^n p_i^t \sqrt{q_i^t q_i^0}}{\sum_{i=1}^n p_i^0 \sqrt{q_i^t q_i^0}}$	A price index defined as the ratio of average weighted prices between period 0 and t with weights as the geometric average of quantities from both periods 0 and t . It is a symmetrically weighted fixed-basket index.

Source: Statistics Canada, Consumer Prices Division.

Appendix B Detailed Calculation Features of Basic Class Indices

Basic class name	% of basket weight * ***	Number of elementary aggregates **	Number of representative products	Sample size (Canada Level) ***	Collection frequency (months per year)	% of prices quality adjusted ****	Quality adjustment method	Formula / methodology
Food								
Fresh or frozen beef	0.59%	7	6	1,596	12	2.6%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Fresh or frozen pork	0.26%	3	2	535	12	1.2%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Other fresh or frozen meat (excluding poultry)	0.07%	3	3	673	12	6.7%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Fresh or frozen chicken	0.47%	1	3	823	12	3.6%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Other fresh or frozen poultry	0.06%	1	1	266	12	5.9%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Ham and bacon	0.11%	2	2	539	12	1.8%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Other processed meat	0.72%	5	6	1,585	12	0.7%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Fresh or frozen fish (including portions and fish sticks)	0.25%	5	8	1,807	12	2.3%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Canned and other preserved fish	0.05%	3	5	1,273	12	1.1%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Seafood and other marine products	0.14%	3	4	782	12	2.8%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Fresh milk	0.42%	6	6	1,509	12	0.0%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Butter	0.07%	1	2	528	12	0.2%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Cheese	0.54%	6	7	1,869	12	0.8%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Ice cream and related products	0.11%	1	2	531	12	1.5%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Other dairy products	0.41%	5	3	798	12	0.3%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Eggs	0.15%	1	2	535	12	0.3%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Bread, rolls and buns	0.53%	1	5	1,320	12	0.5%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Cookies and crackers	0.23%	2	4	1,045	12	2.0%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Other bakery products	0.34%	1	2	521	12	0.3%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Rice and rice-based mixes	0.07%	1	1	264	12	0.5%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Breakfast cereal and other cereal products (excluding baby food)	0.40%	1	7	1,796	12	0.7%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Pasta products	0.11%	3	4	1,031	12	0.2%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Flour and flour-based mixes	0.04%	1	2	519	12	0.0%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Apples	0.12%	1	2	538	12	0.1%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Oranges	0.12%	1	1	287	12	0.0%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Bananas	0.11%	1	1	266	12	0.0%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Other fresh fruit	0.55%	10	5	1,465	12	0.0%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Fruit juices	0.20%	3	4	1,029	12	0.4%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Other preserved fruit and fruit preparations	0.12%	4	7	1,815	12	0.5%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Nuts	0.15%	1	1	264	12	0.0%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Potatoes	0.09%	1	1	268	12	0.0%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Tomatoes	0.16%	1	1	268	12	0.3%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Lettuce	0.08%	1	4	1,100	12	0.1%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Other fresh vegetables	0.73%	14	13	4,111	12	0.7%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Frozen and dried vegetables	0.08%	3	5	1,227	12	0.4%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Canned vegetables and other vegetable preparations	0.23%	8	10	2,564	12	0.4%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index

Appendix B Detailed Calculation Features of Basic Class Indices

Basic class name	% of basket weight *	Number of elementary aggregates **	Number of representative products	Sample size (Canada Level) ***	Collection frequency (months per year)	% of prices quality adjusted ****	Quality adjustment method	Formula / methodology
Food								
Sugar and syrup	0.08%	1	1	262	12	0.0%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Confectionery	0.39%	1	2	660	12	0.2%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Margarine	0.05%	1	2	525	12	0.5%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Other edible fats and oils	0.08%	1	2	524	12	0.5%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Coffee	0.19%	2	2	527	12	1.5%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Tea	0.06%	1	1	262	12	0.4%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Condiments, spices and vinegars	0.34%	5	6	1,565	12	0.4%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Soup	0.11%	1	1	256	12	0.2%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Baby foods	0.07%	3	2	696	12	0.6%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Pre-cooked frozen food preparations	0.32%	2	6	1,581	12	1.4%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
All other food preparations	0.53%	7	7	1,941	12	0.0%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Non-alcoholic beverages	0.48%	3	3	1,197	12	0.4%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Food purchased from table-service restaurants	2.84%	1	8	437	6	5.3%	Expert judgement	Equi-w eighted Jevons index
Food purchased from fast food and take-out restaurants	1.21%	1	7	241	6	1.8%	Expert judgement	Equi-w eighted Jevons index
Food purchased from cafeterias and other restaurants	0.74%	1	0	N/A	N/A	N/A	N/A - Estimated by proxy	N/A - Estimated by proxy
Sub-total	15.4%	143	192					

Appendix B Detailed Calculation Features of Basic Class Indices

Basic class name	% of basket weight ¹	Number of elementary aggregates ²	Number of representative products	Sample size (Canada Level) ³	Collection frequency (months per year)	% of prices quality adjusted ⁴	Quality adjustment method	Formula / methodology
Shelter								
Rent	5.70%	1	1	Renters in Labour Force Survey: 11,200	12	0.0%	Expert judgement	Dutot index
Tenants' insurance premiums	0.08%	1	1	31	12	0.0%	None	Equi-w eighted Jevons index
Tenants' maintenance, repairs and other expenses	0.06%	1	0	N/A	N/A	0.0%	N/A - Estimated by proxy	N/A - Estimated by proxy
Mortgage interest cost	4.10%	1	1	18 interest rates, 800 houses	12	N/A	None	Special calculation, see Chapter 9
Homeowners' replacement cost	4.55%	1	0	800 houses	3 to 12	N/A	None	Special calculation, see Chapter 9
Property taxes and other special charges	3.46%	1	5	180	1	0.0%	None	Unit value index of average property taxes in cities, obtained through sampling of houses within cities (see Chapter 6)
Homeowners' home and mortgage insurance	1.42%	2	1	Industry database: 66,000	1	0.0%	None	Laspeyres-type/Profiles method
Homeowners' maintenance and repairs	1.26%	27	7	351	3 to 12	0.9%	Expert judgement	Equi-w eighted Jevons index
Other own need accommodation expenses	1.60%	4	1	22	N/A	0.0%	None	Equi-weighted Jevons index
Electricity	2.50%	1	1	13	1 to 12	0.0%	None	Explicitly w eighted Jevons index
Water	0.69%	1	2	37	2 to 8	0.0%	None	Explicitly w eighted Jevons index
Natural gas	1.08%	1	1	11	2 to 4	0.0%	None	Explicitly w eighted Jevons index
Fuel oil and other fuels	0.30%	1	1	106	8 to 12	0.3%	None	Equi-w eighted Jevons index
Sub-total	26.8%	43	22					

Appendix B Detailed Calculation Features of Basic Class Indices

Basic class name	% of basket weight*	Number of elementary aggregates**	Number of representative products	Sample size (Canada Level)***	Collection frequency (months per year)	% of prices quality adjusted****	Quality adjustment method	Formula / methodology
Household operations, furnishings and equipment								
Telephone services	2.55%	6	5	84	2	0.0%	None-profiles method	Explicitly weighted Jevons index
Postal and other communications services	0.10%	2	1	18	12	0.0%	None-profiles method	Explicitly weighted Jevons index
Internet access services	0.96%	3	2	18	12	0.0%	None-profiles method	Explicitly weighted Jevons index
Telephone equipment	0.06%	1	1	79	12	6.1%	Overall mean imputation	Equi-weighted Jevons index
Child care services	0.86%	2	1	63	2	0.8%	Expert judgement	Equi-weighted Jevons index
Housekeeping services	0.33%	2	2	58	2	1.4%	Expert judgement	Equi-weighted Jevons index
Detergents and soaps (other than personal care)	0.17%	2	6	1,588	12	1.8%	Quantity adjustment + Overall mean imputation	Equi-weighted Jevons index
Other household cleaning products	0.19%	3	10	1,527	12	1.1%	Quantity adjustment + Overall mean imputation	Equi-weighted Jevons index
Paper supplies	0.45%	2	9	2,239	12	1.0%	Quantity adjustment + Overall mean imputation	Equi-weighted Jevons index
Plastic and aluminum foil supplies	0.10%	2	6	1,639	12	0.3%	Quantity adjustment + Overall mean imputation	Equi-weighted Jevons index
Pet food and supplies	0.59%	1	3	1,235	12	0.6%	Quantity adjustment + Overall mean imputation	Equi-weighted Jevons index
Seeds, plants and cut flowers	0.41%	2	9	148	3 to 4	3.1%	Quantity adjustment + Overall mean imputation	Equi-weighted Jevons index
Other horticultural goods	0.10%	1	1	68	2	13.6%	Quantity adjustment + Overall mean imputation	Equi-weighted Jevons index
Other household supplies	0.21%	1	3	242	4	5.9%	Quantity adjustment + Overall mean imputation	Equi-weighted Jevons index
Other household services	1.52%	9	3	257	1	4.5%	Expert judgement	Equi-weighted Jevons index
Financial services	0.99%	4	10	70	12	0.0%	Profies method	Explicitly weighted Jevons index
Upholstered furniture	0.44%	1	3	111	6	8.8%	Overall mean imputation	Equi-weighted Jevons index
Wooden furniture	0.27%	3	4	106	6	13.3%	Overall mean imputation	Equi-weighted Jevons index
Other furniture	0.30%	3	5	144	6	12.0%	Overall mean imputation	Equi-weighted Jevons index
Window coverings	0.09%	2	3	132	6	2.0%	Overall mean imputation	Equi-weighted Jevons index
Bedding and other household textiles	0.15%	3	6	390	12	3.8%	Overall mean imputation	Equi-weighted Jevons index
Area rugs and mats	0.05%	1	1	N/A	N/A	N/A	N/A - Estimated by proxy	N/A - Estimated by proxy
Cooking appliances	0.16%	3	3	187	6	7.6%	Hedonic adjustment	Equi-weighted Jevons index
Refrigerators and freezers	0.13%	2	3	178	6	8.4%	Hedonic adjustment	Equi-weighted Jevons index
Laundry and dishwashing appliances	0.20%	1	3	186	6	5.9%	Hedonic adjustment	Equi-weighted Jevons index
Other household appliances	0.31%	2	4	194	6	8.4%	Hedonic adjustment	Equi-weighted Jevons index
Non-electric kitchen utensils, tableware and cookware	0.20%	6	10	349	6	3.7%	Overall mean imputation	Equi-weighted Jevons index
Household tools (including lawn, garden and snow removal equipment)	0.42%	5	7	310	6	4.1%	Overall mean imputation	Equi-weighted Jevons index
Other household equipment	0.32%	1	0	N/A	N/A	N/A	N/A - Estimated by proxy	N/A - Estimated by proxy
Services related to household furnishings and equipment	0.28%	2	1	17	3	4.8%	Expert judgement	Equi-weighted Jevons index
Other household furnishings and equipment	0.13%	1	0	N/A	N/A	N/A	N/A - Estimated by proxy	N/A - Estimated by proxy
Sub-total	13.1%	79	125					

Appendix B Detailed Calculation Features of Basic Class Indices

Basic class name	% of basket weight*	Number of elementary aggregates**	Number of representative products	Sample size (Canada Level)***	Collection frequency (months per year)	% of prices quality adjusted****	Quality adjustment method	Formula / methodology
Clothing and footwear								
Women's clothing	2.11%	44	48	1,904	3 to 12	5.7%	Expert judgement	Equi-w eighted Jevons index
Men's clothing	1.25%	28	42	1,869	3 to 12	6.9%	Expert judgement	Equi-w eighted Jevons index
Children's clothing	0.48%	29	55	1,583	3 to 12	12.3%	Expert judgement	Equi-w eighted Jevons index
Women's footwear (excluding athletic)	0.45%	7	15	430	3 to 12	9.6%	Expert judgement	Equi-w eighted Jevons index
Men's footwear (excluding athletic)	0.22%	7	15	453	3 to 12	5.3%	Expert judgement	Equi-w eighted Jevons index
Children's footwear (excluding athletic)	0.09%	5	10	247	3 to 12	12.4%	Expert judgement	Equi-w eighted Jevons index
Athletic footwear	0.47%	10	5	381	12	7.9%	Expert judgement	Equi-w eighted Jevons index
Leather clothing accessories	0.12%	4	5	373	12	2.2%	Expert judgement	Equi-w eighted Jevons index
Other clothing accessories	0.18%	4	3	57	12	7.4%	Expert judgement	Equi-w eighted Jevons index
Watches	0.09%	3	3	79	4	8.3%	Expert judgement	Equi-w eighted Jevons index
Jewellery	0.35%	2	4	74	4	8.6%	Expert judgement	Equi-w eighted Jevons index
Clothing material and notions	0.06%	3	5	117	4	0.6%	Expert judgement	Equi-w eighted Jevons index
Laundry services	0.09%	1	2	51	4	0.0%	Expert judgement	Equi-w eighted Jevons index
Dry cleaning services	0.09%	1	2	44	4	0.6%	Expert judgement	Equi-w eighted Jevons index
Other clothing services	0.03%	2	2	40	4	0.0%	Expert judgement	Equi-w eighted Jevons index
sub-total	6.1%	150	216					
Transportation								
Purchase of passenger vehicles	6.70%	66	65	114	3	22.2%	Option cost method	Equi-w eighted Jevons index
Leasing of passenger vehicles	0.60%	1	0	N/A	N/A	N/A	N/A - Estimated by Proxy	N/A - Estimated by Proxy
Rental of passenger vehicles	0.09%	2	5	35	4	2.9%	Expert judgement	Equi-w eighted Jevons index
Gasoline	3.84%	2	5	1,612	12	0.0%	None	Equi-w eighted Jevons index
Passenger vehicle parts, accessories and supplies	0.70%	5	9	456	2	3.8%	Overall mean imputation or Expert judgement	Equi-w eighted Jevons index
Passenger vehicle maintenance and repair services	1.19%	3	8	542	2	6.4%	Overall mean imputation or Expert judgement	Equi-w eighted Jevons index
Passenger vehicle insurance premiums	2.89%	1	1	Industry database: 219,400	12	0.0%	None	Laspeyres - type, profiles method
Passenger vehicle registration fees	0.28%	1	1	13	1	0.0%	None	One price per province/territory
Drivers' licences	0.11%	1	1	13	1	0.0%	None	One price per province/territory
Parking fees	0.35%	1	3	140	2	0.0%	None	Explicitly weighted Jevons index
All other passenger vehicle operating expenses	0.20%	1	1	68	2	8.6%	Expert judgement	Equi-w eighted Jevons index
City bus and subway transportation	0.49%	1	1	96	2	0.0%	None	Equi-w eighted Jevons index
Taxi and other local and commuter transportation services	0.20%	1	2	99	2	0.0%	None	Explicitly weighted Jevons index
Air transportation	1.24%	18	18	36	12	0.0%	None	Unit value index of avg seat price by plane
Rail, highway bus and other inter-city transportation	0.09%	3	2	40	2	0.0%	None	Explicitly weighted Jevons index
Other public transportation	0.19%	1	4	15	2	0.0%	None	Explicitly weighted Jevons index
sub-total	19.1%	107	122					

Appendix B Detailed Calculation Features of Basic Class Indices

Basic class name	% of basket weight * aggregates **	Number of elementary aggregates **	Number of representative products	Sample size (Canada Level) ***	Collection frequency (months per year)	% of prices quality adjusted ****	Quality adjustment method	Formula / methodology
Health and personal care								
Prescribed medicines	0.77%	17	25	1,410	12	0.3%	Overall mean imputation	Equi-w eighted Jevons index
Non-prescribed medicines	0.46%	1	4	1,054	12	1.0%	Overall mean imputation	Equi-w eighted Jevons index
Eye care goods	0.32%	4	3	99	3	1.6%	Overall mean imputation	Equi-w eighted Jevons index
Other health care goods	0.03%	1	1	279	12	0.9%	Overall mean imputation	Equi-w eighted Jevons index
Eye care services	0.08%	1	3	310	5	0.3%	Expert judgement	Equi-w eighted Jevons index
Dental care services	0.64%	3	3	47	2	0.0%	Expert judgement	Equi-w eighted Jevons index
Other health care services	0.40%	1	1	15	2	0.0%	Expert judgement	Equi-w eighted Jevons index
Personal soap	0.08%	1	1	291	12	0.6%	Overall mean imputation	Equi-w eighted Jevons index
Toiletry items and cosmetics	0.63%	3	6	1,509	12	0.8%	Overall mean imputation	Equi-w eighted Jevons index
Oral hygiene products	0.09%	1	2	572	12	0.7%	Overall mean imputation	Equi-w eighted Jevons index
Other personal care supplies and equipment	0.36%	4	5	1,234	12	0.9%	Overall mean imputation	Equi-w eighted Jevons index
Personal care services	0.86%	3	2	56	4	1.1%	Expert judgement	Equi-w eighted Jevons index
Sub-total	4.7%	40	56					

Appendix B Detailed Calculation Features of Basic Class Indices

Basic class name	% of basket weight + aggregates **	Number of elementary aggregates **	Number of representative products ***	Sample size (Canada Level) ****	Collection frequency (months per year)	% of prices quality adjusted *****	Quality adjustment method	Formula / methodology
Recreation, education and reading								
Sporting and exercise equipment	0.22%	9	14	231	3	10.5%	Overall mean imputation	Equi-w eighted Jevons index
Toys, games (excluding video games) and hobby supplies	0.31%	5	5	373	12	3.0%	Overall mean imputation	Equi-w eighted Jevons index
Computer equipment, software and supplies	0.42%	1	1	13	12	0.0%	Hedonic imputation	Equi-w eighted Jevons index
Multipurpose digital devices	0.19%	2	2	100	12	6.0%	Hedonic imputation	Equi-w eighted Jevons index
Photographic equipment and supplies	0.07%	3	2	23	6	6.9%	Overall mean imputation	Equi-w eighted Jevons index
Other recreational equipment	0.16%	3	1	175	5	7.6%	Overall mean imputation	Equi-w eighted Jevons index
Recreational services	0.18%	2	2	70	6	0.1%	Overall mean imputation	Equi-w eighted Jevons index
Purchase of recreational vehicles and outboard motors	0.95%	6	14	243	3	9.4%	Overall mean imputation	Equi-w eighted Jevons index
Fuel, parts and accessories for recreational vehicles	0.07%	1	N/A	N/A	N/A	N/A	N/A - Estimated by proxy	NA - Estimated by proxy
Insurance, licences and other services for recreational vehicles	0.24%	1	N/A	N/A	N/A	N/A	N/A - Estimated by proxy	NA - Estimated by proxy
Audio equipment	0.09%	6	3	222	6	8.3%	Hedonic imputation	Equi-w eighted Jevons index
Video equipment	0.28%	5	8	625	5	24.8%	Hedonic imputation	Equi-w eighted Jevons index
Rental of digital media	0.01%	1	2	46	5	0.0%	Overall mean imputation	Equi-w eighted Jevons index
Purchase of digital media	0.14%	4	7	329	5	2.2%	Overall mean imputation	Equi-w eighted Jevons index
Other home entertainment equipment, parts and services	0.02%	1	N/A	N/A	N/A	N/A	Overall mean imputation	Equi-w eighted Jevons index
Traveler accommodation	1.02%	19	2	901	12	0.0%	Expert judgement	Equi-w eighted Jevons index
Travel tours	0.90%	5	21	333	3	1.8%	Expert judgement	Equi-w eighted Jevons index
Spectator entertainment (excluding video and audio subscription services)	0.39%	6	13	399	5 to 12	0.0%	None - unit value index	Unit value index of average seat price in stadium/venue for sports and theatre tickets
Video and audio subscription services	1.20%	1	1	198	4	0.0%	None - profiles method	Explicitly w eighted Jevons index
Use of recreational facilities and services	0.75%	7	5	108	2	0.0%	Expert judgement	Equi-w eighted Jevons index
All other cultural and recreational services	0.14%	1	N/A	N/A	N/A	N/A	N/A - Estimated by Proxy	NA - Estimated by Proxy
Tuition fees	2.16%	3	1	Census of all programs in universities	1	0.0%	None	Laspeyres index
School textbooks and supplies	0.23%	2	2	45	1	0.0%	None	Equi-w eighted Jevons index
Other lessons, courses and education services	0.43%	1	1	50	2	0.2%	Expert judgement	Equi-w eighted Jevons index
Newspapers	0.04%	2	4	134	12	0.0%	None	Explicitly w eighted Jevons index
Magazines and periodicals	0.04%	4	4	189	12	0.0%	None	Explicitly w eighted Jevons index
Books and reading material (excluding textbooks)	0.23%	4	10	202	4	0.1%	None - bestsellers method	Equi-w eighted Jevons index
Other reading material (excluding textbooks)	0.01%	1	N/A	N/A	N/A	N/A	N/A - Estimated by Proxy	NA - Estimated by Proxy
Sub-total	10.9%	106	125					

Appendix B Detailed Calculation Features of Basic Class Indices

Basic class name	% of basket weight* aggregates**	Number of elementary aggregates**	Number of representative products	Sample size (Canada Level)***	Collection frequency (months per year)	% of prices quality adjusted****	Quality adjustment method	Formula / methodology
Alcoholic beverages and tobacco products								
Beer served in licensed establishments	0.23%	1	1	111	4	0.0%	Expert judgement	Equi-w eighted Jevons index
Wine served in licensed establishments	0.09%	1	2	210	4	6.5%	Expert judgement	Equi-w eighted Jevons index
Liquor served in licensed establishments	0.12%	1	1	109	4	0.7%	Expert judgement	Equi-w eighted Jevons index
Beer purchased from stores	0.53%	1	17	217	12	0.2%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Wine purchased from stores	0.38%	7	34	746	12	1.0%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Liquor purchased from stores	0.27%	13	30	667	12	0.3%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Other alcoholic beverages purchased in stores	0.01%	1	N/A	N/A	N/A	N/A	N/A - Estimated by Proxy	N/A - Estimated by Proxy
Cigarettes	1.15%	1	6	556	12	0.4%	Quantity adjustment + Overall mean imputation	Equi-w eighted Jevons index
Other tobacco products and smokers' supplies	0.07%	1	N/A	N/A	N/A	N/A	N/A - Estimated by Proxy	N/A - Estimated by Proxy
Sub-total	2.9%	27	91					
Total	100.0%	696	949					

Notes:

- * The relative basket weight (in %) refers to the introduction of the 2013 basket, at the month of linking in. Figures may not add up to 100% as a result of rounding.
- ** Elementary aggregate to Basic class correspondence may be 1 to 1 or many to 1. Some elementary aggregates may not be directly calculated (see Chapter 6).
- *** The average monthly sample size takes into account collection frequency. Not all Consumer Price Index categories are priced on a monthly basis.
- **** The frequency of quality adjustment is calculated as the incidence of quality adjustments in the calendar year 2012, divided by the number of price quotes collected (excluding non-pricing months).

Source: Statistics Canada, Consumer Prices Division.

Appendix C Detailed Chronology of Basket Updates and Changes to the Consumer Price Index

Basket Reference Year	Basket link month ²	Basket start month ³	Basket end month ⁴	Food Basket ⁵	Revisions at basket update	Target population/geographical coverage	New products introduced	Other notable changes
1913		Jan-1914	Dec-1927	1913	N/A	N/A	N/A	Annual indices were available from 1913. January 1914 marked the introduction of continuous monthly indices.
1926	Dec-1927	Jan-1928	Aug-1940	1926	N/A	N/A	N/A	N/A
1937 - 1938	Aug-1940	Sept-1940	Dec-1948	1937-1938	N/A	Urban wage-earner families with annual incomes during the basket reference period between \$450 and \$2,500.	N/A	N/A
1947-1948 (Sept 1947 - Aug 1948)	Dec-1948	Jan-1949	Dec-1960	1947-1948	Index values were revised back to the basket link month, January 1949, when the basket was introduced in August 1952.	All Canadian families living in 27 Canadian cities with a population over 30,000, ranging in size from two adults to two adults with four children, and with annual incomes during the basket reference period ranging from \$1,650 to \$4,050.	Owned accommodation was introduced into the CPI	<ul style="list-style-type: none"> The name of the index was changed from "Cost-of-living index" to "Consumer Price Index (CPI)". Seasonal baskets were used for food
1957	Dec-1960	Jan-1961	Apr-1973	1957	This was the first basket in which the official CPI values previously released were not revised and a "no revision" policy was adopted for the CPI. Index values under the new 1957 basket were calculated back to January 1957 for comparison purposes only.	Same as previous basket.	Forty-three new products were added to the basket. Examples include: frozen foods, air travel and the purchase and repair of television sets. Twelve products were removed from the basket. Examples include: canned strawberries, ice, brooms, hospital rates, radio licenses.	N/A

Appendix C Detailed Chronology of Basket Updates and Changes to the Consumer Price Index

Basket Reference Year	Basket link month	Basket start month	Basket end month	Food Basket	Revisions at basket update	Target population/geographical coverage	New products introduced	Other notable changes
1967	Apr-1978	May -1973	Sept-1978	1969	"No revision" policy.	All Canadian families living in urban centres with metropolitan populations exceeding 30,000, ranging in size from two to six persons, consisting of any combination of adults or adults and children, and with annual incomes during the basket reference period ranging from \$4,000 to \$12,000.	<p>Forty-four new products were added to the basket. Examples include: parking, stereos, cameras, hotels/motels, tuition fees and alcohol consumed in licensed premises. Twenty-four products were removed from the basket. Examples include: lard, coal, wool blanket, knitting yarn, doctors' services, prepaid medical care.</p>	<p>A supplementary product classification was created in order to calculate separate indices for goods and services.</p> <p>This marked the return to annual weights for food, replacing the seasonal food weights used in the CPI since 1949.</p>
1974	Sep-78	Oct-78	Mar-82	1974	Previously published city indices were revised to reflect an expanded shelter component.	Canadian families and unattached individuals living in private households in urban centres with populations of 30,000 and over. This was the first time that family size and household income were not determinants of the target population.	N/A	<p>A policy of regular basket updates was established, with the updates tied to a four-year cycle of the Family Expenditure Survey (FAMEX).</p> <p>National indices were calculated as weighted averages of the corresponding indices for 59 urban centres.</p> <p>The New Housing Price Index (NHPI) replaced the Residential Building Construction Input Price Index in the CPI series measuring homeowners' replacement cost, mortgage interest cost and insurance for owned accommodation.</p>

Appendix C Detailed Chronology of Basket Updates and Changes to the Consumer Price Index

Basket Reference Year ¹	Basket link month ²	Basket start month ³	Basket end month ⁴	Food Basket ⁵	Revisions at basket update	Target population/geographical coverage	New products introduced	Other notable changes
1978	Mar-1982	Apr-1982	Dec-1984	1978	N/A	<ul style="list-style-type: none"> The general target population remained the same as in the previous basket. Indices for two northern cities, Whitehorse and Yellowknife, were calculated for the first time. Sixty-four urban centres were grouped into 31 strata, using geographical proximity and urban centre size as major criteria of this stratification. 	N/A	N/A
1982	Dec-1984	Jan-1985	Dec-1988	1982	N/A	Whitehorse and Yellowknife were incorporated into the calculation of the All items CPI	N/A	A standard classification of goods and services (the Consumer Classification System) was introduced.
1986	Dec-1988	Jan-1989	Dec-1994	1986	N/A	Eighty-two urban centres were grouped into 34 strata.	N/A	N/A

Appendix C – Detailed Chronology of Basket Updates and Changes to the Consumer Price Index

Basket Reference Year ¹	Basket link month ²	Basket start month ³	Basket end month ⁴	Food Basket ⁵	Revisions at basket update	Target population/geographical coverage	New products introduced	Other notable changes
1992	Dec-1994	Jan-1995	Dec-1997	1992 N/A	N/A	<p>Target population was expanded to include expenditures made by residents of smaller cities, towns and rural communities.</p> <p>Target population was expanded to include all private households in Canada. The condition of population equal to or greater than 30,000 was dropped.</p> <p>Also added were expenditures made by households that existed for only part of the basket reference year 1992 (such as college students living separately during the school year).</p>	N/A	<p>The introduction of the 1992 basket was postponed by two years to ensure it would reflect adjustments to consumption patterns resulting from the introduction of the Goods and Services Tax (GST) and the removal of the Federal Sales tax in January 1991.</p> <p>The "housing" component from the 1986 basket was split into two major components: "shelter" and "household operations, furnishings and equipment". This brought the number of major components to a total of eight. Also, the definition of "shelter" was changed. The traveller accommodation category, which was part of the 1986 definition of "shelter", was moved to "recreation" with the introduction of the 1992 basket. To provide some continuity certain aggregates were reconstructed using their 1986 basket definitions.</p> <p>No adjustment was made to the basket weight for alcohol.</p>
1996	Dec-1997	Jan-1998	Dec-2002	1996 N/A	N/A	<p>Target population was expanded to include all private households in Canada. The condition of population equal to or greater than 30,000 was dropped.</p>	N/A	

Appendix C Detailed Chronology of Basket Updates and Changes to the Consumer Price Index

Basket Reference Year ¹	Basket link month ²	Basket start month ³	Basket end month ⁴	Food Basket ⁵	Revisions at basket update	Target population/geographical coverage	New products introduced	Other notable changes
2001	Dec-2002	Jan-2003	Apr-2007	2001	N/A	An index for Inuit, the capital city of the newly created Territory of Nunavut, was calculated from December 2002 onwards with December 2002 as the time base.	Internet access services and financial services were both added to the CPI basket as new product classes.	The first CPI basket to be based on the Survey of Household Spending (SHS) rather than on the Family Expenditure Survey (FAMEX). The CPI classification for clothing was collapsed into women's clothing, men's clothing and children's clothing, since the SHS did not have the more detailed breakdown previously available in FAMEX.
2005	Apr-2007	May-2007	Apr-2011	2001	N/A	N/A	Medical services not covered by provincial health care systems were introduced into the basket.	N/A
2009	Apr-2011	May-2011	Jan-2013	2009	N/A	N/A	Several new product classes were added to the CPI basket including smartphones, tablet PCs, funeral services, retail club memberships, government services (e.g. Passport fees).	N/A

Appendix C Detailed Chronology of Basket Updates and Changes to the Consumer Price Index

Basket Reference Year ¹	Basket link month ²	Basket start month ³	Basket end month ⁴	Food Basket ⁵	Revisions at basket update	Target population/geographical coverage	New products introduced	Other notable changes
2011	Jan-2013	Feb-2013		2011	N/A	N/A	N/A	The first basket update using the redesigned Survey of Household Spending (SHS-R). The first biennial basket update.
2013	Dec-14	Jan-15		2013	N/A	N/A	Additional fruits and vegetables added to list of elementary aggregates. On-line video subscriptions included with satellite and cable video subscriptions.	Certain obsolete products such as 35mm film removed from list of elementary aggregates. Clothing elementary aggregates below the Basic Class level reorganised to better represent the current clothing market.

Notes:

1. Expenditure weight reference period.
2. Month in which the new basket weights are chained to the old basket weights.
3. First month the Consumer Price Index (CPI) calculation uses the new basket weights.
4. Last month the CPI calculation uses the new basket weights.
5. Food expenditure reference period.

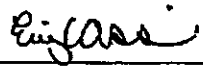
Source: Statistics Canada, Consumer Prices Division.

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This is Exhibit "D" referred to in the
Affidavit of Philip Cross
sworn before me, this 20th day of July, 2018.



Commissioner for Taking Affidavits

Court File No.: CV-18-59010500 CP

**ONTARIO
SUPERIOR COURT OF JUSTICE**

BETWEEN:

LESLIE AUSTIN

Plaintiff

- and -

**BELL CANADA, BELL MEDIA INC.,
EXPERTECH NETWORK INSTALLATION INC., and BELL MOBILITY INC.**


Defendants

ACKNOWLEDGMENT OF EXPERT'S DUTY

1. My name is Philip Cross. I live in the City of Ottawa, in the Province of Ontario.
2. I have been engaged by counsel for the Plaintiff to provide evidence in relation to the above-noted court proceeding.
3. I acknowledge that it is my duty to provide evidence in relation to this proceeding as follows:
 - (a) to provide opinion evidence that is fair, objective and non-partisan;
 - (b) to provide opinion evidence that is related only to matters that are within my area of expertise; and
 - (c) to provide such additional assistance as the court may reasonably require, to determine a matter in issue.
4. I acknowledge that the duty referred to above prevails over any obligation which I may owe to any party by whom or on whose behalf I am engaged.

20/7/18

Date
KM-3165513v1


Philip Cross

Court File No.: CV-18-590105-00CP

**ONTARIO
SUPERIOR COURT OF JUSTICE**

Proceeding commenced at Toronto

**AFFIDAVIT OF PHILIP CROSS
(Sworn July 20 2018)**

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Court File No.: CV-18-590105-00CP

**ONTARIO
SUPERIOR COURT OF JUSTICE**

BETWEEN:

LESLIE AUSTIN

Plaintiff

- and -

**BELL CANADA, BELL MEDIA INC.,
EXPERTECH NETWORK INSTALLATION INC., and BELL MOBILITY INC.**
Defendants

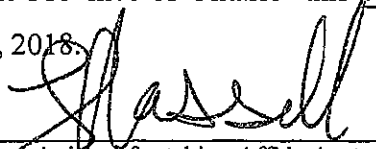
Proceeding under the *Class Proceedings Act, 1992*

**AFFIDAVIT OF CAMERON J. MCNEILL
(Sworn July 24, 2018)**

I, Cameron J. McNeill, of the City of Toronto, in the Province of Ontario, MAKE OATH AND SAY:

1. I have been retained by Koskie Minsky LLP and McKenzie Lake Lawyers LLP on behalf of their clients in these proceedings.
2. A copy of my report is attached as Exhibit "A". A copy of my curriculum vitae is attached as an appendix to my report.
3. Attached as Exhibit "B" is a copy of my Acknowledgement of Expert's Duty.

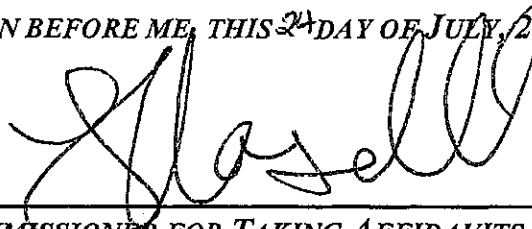
SWORN BEFORE ME at the City of Toronto,
in the Province of Ontario this 24 day of
July, 2018.


A Commissioner for taking Affidavits (or as may be)


CAMERON J. MCNEILL

**Llya Greenberg Hassall, a Commissioner, etc.
Province of Ontario, while a Student-at-Law,
Expires June 14, 2021.**

*THIS IS EXHIBIT "A" REFERRED TO IN THE
AFFIDAVIT OF CAMERON J. MCNEILL
SWORN BEFORE ME, THIS 2nd DAY OF JULY, 2018*



A COMMISSIONER FOR TAKING AFFIDAVITS, ETC.

Lilya Greenberg Hassall, a Commissioner, etc.
Province of Ontario, while a Student-at-Law,
Expires June 14, 2021.



MEMORANDUM

To: Mark Zigler, Jonathan Ptak
From: Cameron McNeil
Date: July 24, 2018
Re: Austin vs. Bell – Estimated Pensioner Losses from Indexation

This report has been prepared at the request of Koskie Minsky in the above matter, to determine estimated losses with respect to the annual indexation provided on January 1, 2017, to pensioners of the Bell Canada Pension Plan.

In reading this report, please note that Segal does not give legal, investment, tax or accounting advice, but is familiar with these matters as they apply to the field of occupational pensions.

SUMMARY

Bell Canada (the “Company”) is the sponsor of the Bell Canada Pension Plan (the “Plan”) which is administered by Morneau Shepell (the “Administrator”). The Plan is a registered pension plan as defined in the Income Tax Act (ITA) and provides for annual pension increases, which are tied to Canada’s consumer price index (CPI).

The Class represented in this case can be broadly defined as all persons in receipt of a pension benefit who were eligible for the annual indexation under the Bell Canada Pension Plan as at January 1, 2017.

The Class received indexation on their benefits of 1% at January 1, 2017. However, we have been asked to assume that the 1% indexation rate as outlined in the statement of claim was incorrectly determined and should have been 2%.

Koskie Minsky has retained Segal as actuaries to assist with the determination of estimated losses and has asked us to answer the following questions:

1. Describe your background and expertise as an actuary and in relation to loss valuation as well as any other expertise relevant to the issues below. Please also attach an updated CV.

Mark Zigler, Jonathan Ptak
Austin vs. Bell
July 24, 2018
Page 2

2. Based on your education, experience and expert opinion, please provide your opinion on the following:
 - a) whether, assuming the alleged facts in the Statement of Claim are true, there is an appropriate actuarial methodology for assessing the aggregate loss of the entire Class, without requiring individual enquiries of the Class members?
 - b) if so,
 - i. what is that methodology? and
 - ii. what is the aggregate loss of the Class?

We were provided with the following documentation that we have relied upon in determining the loss;

- > Actuarial valuation report for the Plan as at 31 December 2016 and 31 December 2010
- > The Statement of Claim
- > The formal Plan text
- > Amendments to the formal Plan text #20-24

RESULTS

Question 1: Describe your background and expertise as an actuary and in relation to loss valuation as well as any other expertise relevant to the issues below. Please also attach an updated CV.

I have over 30 years' experience in the pension industry advising on liability valuations for funding, accounting and loss purposes in both the UK and Canada. Since joining Segal, I have worked on many cases involving loss assessment in a strategic and peer review capacity.

As a manager, I have been responsible for the delivery of actuarial and investment consulting, including the development and maintenance of actuarial standards and controls, and the development and delivery of administration services to clients including several major Canadian banks.

A full CV is attached at the end of this report.

Mark Zigler, Jonathan Ptak
Austin vs. Bell
July 24, 2018
Page 3

Question 2: Based on your education, experience and expert opinion, please provide your opinion on the following:

(a) whether, assuming the alleged facts in the Statement of Claim are true, there is an appropriate actuarial methodology for assessing the aggregate loss of the entire Class, without requiring individual enquiries of the Class members?

(b) if so,

(i) what is that methodology? and

(ii) what is the aggregate loss of the Class?

(a) Assuming the alleged facts in the Statement of Claim are true, we can confirm that there is an appropriate actuarial methodology to assess the aggregate loss of the entire Class.

(b) (i) The Class size is large enough that approximating the loss for the average individual and applying that average to the entire Class would yield results credibly close to the summation of each Class member's individual loss. The Method section below explains this method in detail and offers some estimation of its accuracy. In summary, we believe the method offers an unbiased estimate of the true costs with a negligible margin for error.

METHOD

Step 1: Determining the *Cost to the Plan* (Scenario A in (b (ii)) below) is simply to take 1% of the total pensioner liabilities from the actuarial valuation report. However, there is some uncertainty around the assumed timing therein of the application of the annual CPI increase. Our approach here was to divide out the increase due in 2017 as per the valuation assumption (1.6%). That gave us a rounded loss which would be precise other than for the application of the first year adjustment.

Step 2: The actuarial valuation report provided average, annual pension data in age bands, along with headcounts in each age band and the percent of those who are in receipt of a Joint and Survivor pension. We were able to use this information to apply a second methodology for the purposes of cross-checking our results in Step 1.

We took the average pension for each age band and scaled it by 1% (the indexation provided for at January 1, 2017) and then again by 2% (the indexation rate as claimed by the Class). The difference between these two amounts results in the estimated amount of annual pension lost by the Class.

For each age band, we then determined the value, at January 1, 2017, of the lost amount of lifetime pension using standard actuarial projection and discounting techniques. We did this using the going concern assumptions from the Plan. Actuarial valuation report, and again using the in-force solvency assumptions as at 31 December 2017 as an annuity proxy.

Mark Zigler, Jonathan Ptak
Austin vs. Bell
July 24, 2018
Page 4

Step 3: A comparison of Steps 1 and 2 confirms our age grouped method is accurate to around 1% for establishing the *Cost to the Plan*. This gives us comfort in using the age group method for the annuity proxy cost, *Cost to the Pensioners* (Scenario B found in (b (ii)) below).

Step 4: For grossing-up purposes, we assumed each pensioner was in receipt of the average registered plan pension, a full CPP (reduced for age groups below age 65) and the average notional annuity distribution paid in 2018 and no other income. Average tax rates were determined with the same income less the notional annuity distribution and applied as noted below, on all amounts. A tax loss arises when amounts otherwise paid monthly are paid as a lump sum and taxed at a higher marginal rate.

Step 5: To establish the missed payments, we allowed for mortality in accordance with the actuarial valuation assumption in the intervening period. This was done based on the average age within each 5-year age group as noted above.

(b) (ii) There are several ways to estimate the cost, or value, of the loss. We present numbers using two approaches as follows.

AGGREGATE LOSS

A. *Cost to the Plan*

The cost to the Plan, as at 1 January 2017, totals \$108,468,000, based on the assumptions set out below. Based on the Plan's actuarial valuation at that date, this is the cost of providing the additional benefits (i.e. 1% of pension amounts with future indexation) through the Plan.

We note that the Plan's funding position may well mean that Bell does not have to actually contribute this amount, at least in full, into the Plan to fund these benefits. For these purposes, the funding position of the Plan is immaterial and does not affect the cost estimate given.

B. *Cost to the Pensioners*

If we assess the loss from the point of view of the pensioners, we get a quite different answer. In this case, we are looking at the cost to the member of replacing the lost income. To do that we have estimated the cost of a group annuity purchase. The aggregate loss to the Class at 1 January 2017 totals \$124,942,000 based on the annuity assumptions set out below. We note that the annuity pricing proxy available to us is based on the following key assumptions that may not play out in reality:

- It assumes all pensioners secure an annuity with the proceeds. In practice, if settlement is made by a lump sum rather than through the plan, each pensioner would be free to make their own purchase decision.

Mark Zigler, Jonathan Ptak
Austin vs. Bell
July 24, 2018
Page 5

- The pricing assumes the money is coming from a registered pension plan so that no tax charge arises on lump sum settlement and subsequent income from the lump sum is taxed as income in the usual way.

For these reasons, no method will offer precision, but we believe that the method used is appropriate since it broadly replicates the cost to the individuals of investing in a reasonably cautious manner and drawing down to provide a lifetime income.

After reflecting the income tax paid on the future payments and grossing up for income tax on a lump sum settlement, the loss to the Class is \$136,897,000. This is an increase of 9.57% over the pre-tax amount and reflects the additional tax arising from a lump sum settlement.

C. Missed Payments

Applicable to A and B above, the missed payments from January 1, 2017 up to and including July 1, 2018 amount to \$12,628,100. This amount reflects expected mortality of the groups as a whole over the period and the 1% indexation provided at January 1, 2018, but does not reflect interest. This method is explained above. We have not applied the tax increase to this amount here since the numbers per member are too small to shift the tax bracket if this amount is settled in isolation of the larger amounts above.

For the avoidance of doubt, these missed payments have been valued at A and B above and have been grossed-up therein as indicated above.

D. Method B Updated to "today's date"

If we restate the annuity proxy loss at today's date, we arrive at \$109,745,000 with respect to lost pension from 1 July 2018 onwards. Applying the 9.57% gross-up gives \$120,246,000. Note the missed payments are not included here so this number is not directly comparable to A and B above.

To allow comparison, we add \$13,836,600 representing the \$12,628,100 of missed payments up to and including July 1, 2018, along with the 9.57% gross-up. This gives a total loss of \$134,082,600.

Mark Zigler, Jonathan Ptak
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ASSUMPTIONS

The amounts are based on the following actuarial assumptions:

Discount rate (to value the cost to the Plan)	3.22% per annum for 10 years and 5.16% per annum thereafter	We used the discount rate from the latest actuarial valuation that the Plan currently uses for funding.
Post-retirement Indexation rate (to value the cost to the Plan)	1.60% per annum	We used the indexation rate from the latest actuarial valuation that the Plan currently uses for funding.
Annuity purchase rate (to value the loss to the Class)	3.10% per annum	We used the discount rate that the Plan actuaries have determined to be the annuity purchase rate, determined using Canadian Institute of Actuaries Educational Note on the development of annuity purchase rates for a December 31, 2016 valuation date.
Post-retirement Indexation rate (to value the loss to the Class)	2.02% per annum	Based on Bell Canada' Proxy Basis assumptions.
Mortality rates (Used to value the cost to the Plan)	2014 Canadian Pensioners' Private Mortality Table adjusted for size of pension with generational projection using mortality improvement Scale CPM-B . The adjustments are 80% for male and 115% for female.	This mortality assumption is as used by Bell Canada in their most recent actuarial report
Mortality rates (Used to value the loss to the Class)	2014 Canadian Pensioners' Mortality Table with generational projection using mortality improvement Scale CPM-B.	This mortality assumption is as used by for the purposes of determining annuity values as required by the CIA guidance.
Age	58 for the under age 60 age group, 87 for the above 85 age group and the mid-point for all remaining age groups.	The data provided information grouped within 5-year age bands. Without any additional information, we assumed the average age in each age group to be the mid-point within the 5 years.
Male/Female split	50% male, 50% female	We assumed that the distribution of male/female liability would be as reported in the latest actuarial report of the Bell Canada Pension Plan

Mark Zigler, Jonathan Ptak
 Austin vs. Bell
 July 24, 2018
 Page 7

Joint and Survivor form	60%	For the purposes of valuing those who have a joint & survivor benefit, as reported in the data, we assumed the minimum pension requirement of a 60% J&S
Average and marginal tax rate to estimate net benefits paid from the RPP	Average - 12.40% Marginal – 20.05%	We used average and marginal tax rates for incomes from \$20,000 to \$500,000 based on EY tax calculators and followed the process as used for the average tax rate above but using the total income plus the claim amount. The weighted average is based on the total income plus the claim amount. Amounts received by recipients are assumed to be taxed as income

DATA SUMMARY

The December 31, 2016 actuarial report provided the data we used in our analysis and is summarized below:

	Headcount	Average Pension	Percent with JS	Headcount of Bridge Benefits	Average Bridge Benefit
<60	3,555	21,307	62%	2,697	20,074
60-64	6,584	20,105	63%	4,477	18,104
65-69	7,553	18,855	57%	n/a	n/a
70-74	6,016	18,059	52%	n/a	n/a
75-79	4,352	18,104	40%	n/a	n/a
80-84	3,526	19,615	33%	n/a	n/a
>85	3,459	17,690	13%	n/a	n/a

Cameron McNeill FCIA, FFA
 Senior Vice President

cc: Nevio Tenuta, Segal Consulting



CAMERON MCNEILL, FFA, FCIA
Senior Vice President and Consulting Actuary

Expertise

Mr. Cameron McNeill has been in the pension industry since 1984, when he joined Mercer in Edinburgh, Scotland. He qualified as a fellow of the Faculty of Actuaries (UK) in 1990. In 1991 he joined Buck Consultants in Edinburgh where he worked as a pension actuary until 1999. At that time, he transferred to Buck's Manchester, England office as Consulting Actuary and Market Leader. Cameron also chaired Buck's UK Retirement Practice Group.

During his time in the UK, Cameron worked with Trustee Boards, as a consulting actuary, in all areas of pension design, management, governance and funding. He helped design a Trustee Training course and was a regular presenter.

In 2007 he became CEO for Buck Canada and joined their Global Executive Team.

Due to work permit restrictions, Cameron was initially an Affiliate of the Canadian Institute of Actuaries (CIA) until obtaining permanent residency in 2011. He was then able to sit the one CIA examination required for full Fellowship, which he obtained in June 2011.

Mr. McNeill joined Segal in 2013, where he serves as the Canadian Business Leader. He also sits on the Regional Leaders Group for the US based firm.

Mr. McNeill currently acts as signing actuary for several Segal clients, including multi and single employer plans.

Committees

While in the UK, Mr. McNeill sat briefly on the Faculty's Disciplinary Committee.

After coming to Toronto, he also served for two years as a Member of the Toronto Board of Trade Economic Development Committee.

He is currently on the investment committee of a major Canadian charity and sits on the MEPP Advisory Committee of Ontario's pension regulator, FSCO.

He also sits on the content advisory body for one of Canada's leading independent seminar organizations.

Education/Professional Designations

Mr. McNeill is a Bachelor of Science, Honours graduate from Glasgow University where he studied mathematics.

He obtained full Fellowship of the UK actuarial profession in 1990 and the Canadian profession in 2011.

Published Work/Speeches

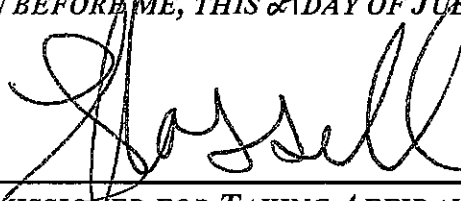
He has written many articles in the UK and Canada and spoken at many conferences and seminars. He has addressed the CIA annual general meeting on the subject of funding, equity risk and pension plans. In recent years, he has addressed IF audiences regularly on all aspects of pension work and is a trainer on their trustee-training programmes.

Experience

Mr. McNeill's Canadian experience includes the following:

- Leading what was, at the time, Canada's largest annuity buy-out;
- Responsibility for \$35m in revenue including services to several of Canada's "big 5" banks;
- Managing and developing those banking relationships and overseeing a change in service delivery agreement standards for administration from "red" to "green";
- Responsibility for the delivery of actuarial consulting, investment consulting, benefit consulting, administration (DB and DC), technology and communications services;
- Developing and implementing a framework for improved delivery, risk management and efficiency on DB and DC administration services;
- Developing and implementing a framework for national standards and compliance for actuarial work;
- Developing and implementing firm wide practices for business control and risk management and mitigation;
- Signing actuary on single-employer pension plans;
- Signing actuary on multi-employer pension plans;
- Investment compliance officer for one of Canada's largest multi-employer plans;
- Development and review of loss assessments strategies for various legal claims;
- Advising various clients on risk management and governance practices;
- Developing funding and investment solutions for aging workforces.

*THIS IS EXHIBIT "B" REFERRED TO IN THE
AFFIDAVIT OF CAMERON J. MCNEILL
SWORN BEFORE ME, THIS 2ND DAY OF JULY, 2018*



A COMMISSIONER FOR TAKING AFFIDAVITS, ETC.

Liliya Greenberg Hassall, a Commissioner, etc.
Province of Ontario, while a Student-at-Law,
Expires June 14, 2021.

Court File No.: CV-18-59010500 CP

**ONTARIO
SUPERIOR COURT OF JUSTICE**

BETWEEN:

LESLIE AUSTIN

Plaintiff

- and -

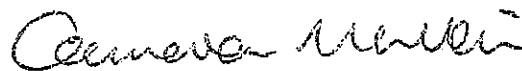
**BELL CANADA, BELL MEDIA INC.,
EXPERTECH NETWORK INSTALLATION INC., and BELL MOBILITY INC.**

Defendants

ACKNOWLEDGMENT OF EXPERT'S DUTY

1. My name is Cameron J. McNeill. I live in the City of Toronto, in the Province of Ontario.
2. I have been engaged by counsel for the Plaintiff to provide evidence in relation to the above-noted court proceeding.
3. I acknowledge that it is my duty to provide evidence in relation to this proceeding as follows:
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 - (b) to provide opinion evidence that is related only to matters that are within my area of expertise; and
 - (c) to provide such additional assistance as the court may reasonably require, to determine a matter in issue.
4. I acknowledge that the duty referred to above prevails over any obligation which I may owe to any party by whom or on whose behalf I am engaged.

Date July 27, 2018
KM-3364885v1



Cameron J. McNeill

**ONTARIO
SUPERIOR COURT OF JUSTICE**

Proceeding commenced at Toronto

AFFIDAVIT OF CAMERON J. MCNEILL
(Sworn July 24 2018)

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Lawyers for the Plaintiff

RESEARCH AND DEVELOPMENT

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LESLIE AUSTIN

Plaintiff

and

BELL CANADA ET AL.

Defendants

Court File No.: CV-18-590105-00CP

**ONTARIO
SUPERIOR COURT OF JUSTICE**

Proceeding commenced at Toronto
Proceeding under the *Class Proceedings Act, 1992*

**MOTION RECORD OF THE PLAINTIFF
(Implementation Motion)
(Fee Approval Motion)
(Opt Out Motion)
VOLUME 3 OF 5**

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