

Catalogue no. 62F0014M
ISSN 1706-7723
ISBN 978-0-660-40838-5

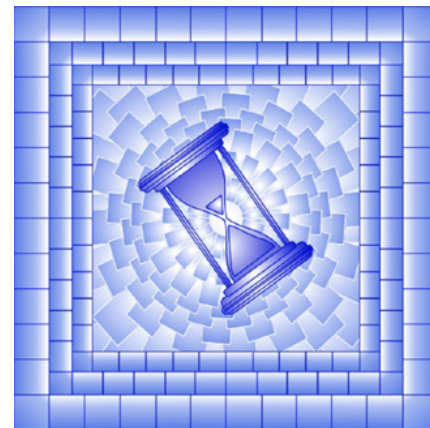
Prices Analytical Series

Consumer Price Index and Inflation Perceptions in Canada: Can measurement approaches or behavioural factors explain the gap?

by Roobina Keshishbanoosy, Faouzi Tarkhani,
Alice Xu, Clément Yélou
Statistics Canada

Patrick Sabourin, Olena Kostyshyna
Bank of Canada

Release date: January 19, 2022



Statistics
Canada

Statistique
Canada

Canada

How to obtain more information

For information about this product or the wide range of services and data available from Statistics Canada, visit our website, www.statcan.gc.ca.

You can also contact us by

Email at infostats@statcan.gc.ca

Telephone, from Monday to Friday, 8:30 a.m. to 4:30 p.m., at the following numbers:

- Statistical Information Service 1-800-263-1136
- National telecommunications device for the hearing impaired 1-800-363-7629
- Fax line 1-514-283-9350

Depository Services Program

- Inquiries line 1-800-635-7943
- Fax line 1-800-565-7757

Standards of service to the public

Statistics Canada is committed to serving its clients in a prompt, reliable and courteous manner. To this end, Statistics Canada has developed standards of service that its employees observe. To obtain a copy of these service standards, please contact Statistics Canada toll-free at 1-800-263-1136. The service standards are also published on www.statcan.gc.ca under "Contact us" > "[Standards of service to the public](#)."

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 co-operation and goodwill.

Published by authority of the Minister responsible for Statistics Canada

© Her Majesty the Queen in Right of Canada as represented by the Minister of Industry, 2022

All rights reserved. Use of this publication is governed by the Statistics Canada [Open Licence Agreement](#).

An [HTML version](#) is also available.

Cette publication est aussi disponible en français.

Consumer Price Index and Inflation Perceptions in Canada: Can measurement approaches or behavioural factors explain the gap?

by **Roobina Keshishbanoosy, Faouzi Tarkhani, Alice Xu, Clément Yélou**

Statistics Canada

Patrick Sabourin, Olena Kostyshyna

Bank of Canada

Abstract

Many decisions by economic agents, such as firms and consumers, depend on their views about inflation. These views have significant implications for economic activity and monetary policy. Consumers' views of inflation, as measured by the Bank's Canadian Survey of Consumer Expectations (CSCE), are systematically higher than the actual inflation measured by the Consumer Price Index (CPI), and more so for certain demographic groups. While measurement factors including quality adjustment, and the treatment of housing in the CPI can explain part of this gap, behavioral factors appear to play a larger role. Personal shopping experiences, views about food and rent price increases, and higher sensitivity to large price increases are important drivers of differences between measured inflation and inflation perceptions. Furthermore, information gaps and level of economic literacy can also help explain the way inflation is perceived. Policy makers can play a role to make information more readily available and to improve awareness and understanding of inflation literacy towards narrowing the perception gap.

1. Introduction

Decisions of many economic agents such as firms and consumers depend on their views about inflation. Expectations of inflation determine expectations of real interest rates and therefore are important for the effectiveness of monetary policy.

As a result, many central banks conduct surveys to better understand what people think about inflation. The Bank of Canada conducts the Canadian Survey of Consumer Expectations (CSCE) and the Business Outlook Survey and publishes their results quarterly.

To ensure that inflation perceptions are well anchored, it is important to understand their behaviour and the drivers of differences between perceived and measured inflation. For this analysis, we are focusing on views of inflation by Canadian households. Results from CSCE data indicate that there is a gap between perceived inflation and inflation measured by Statistics Canada's Consumer Price Index (CPI). Current perceptions of the inflation rate for the past year, expectations of the inflation rate for one-year-ahead and five-years-ahead are consistently higher than the CPI inflation rate (Chart 1).¹ In fact, consumer's inflation expectations are higher than measured inflation in many other countries, including the United States, the United Kingdom and European countries. Results from CSCE show significant differences in inflation perceptions among different socio-demographic groups.²

The following lists key drivers of the perception-measurement gap.

Measurement factors

- CPI basket weights representativeness
- Quality adjustment
- Cost of housing vs. cost of houses

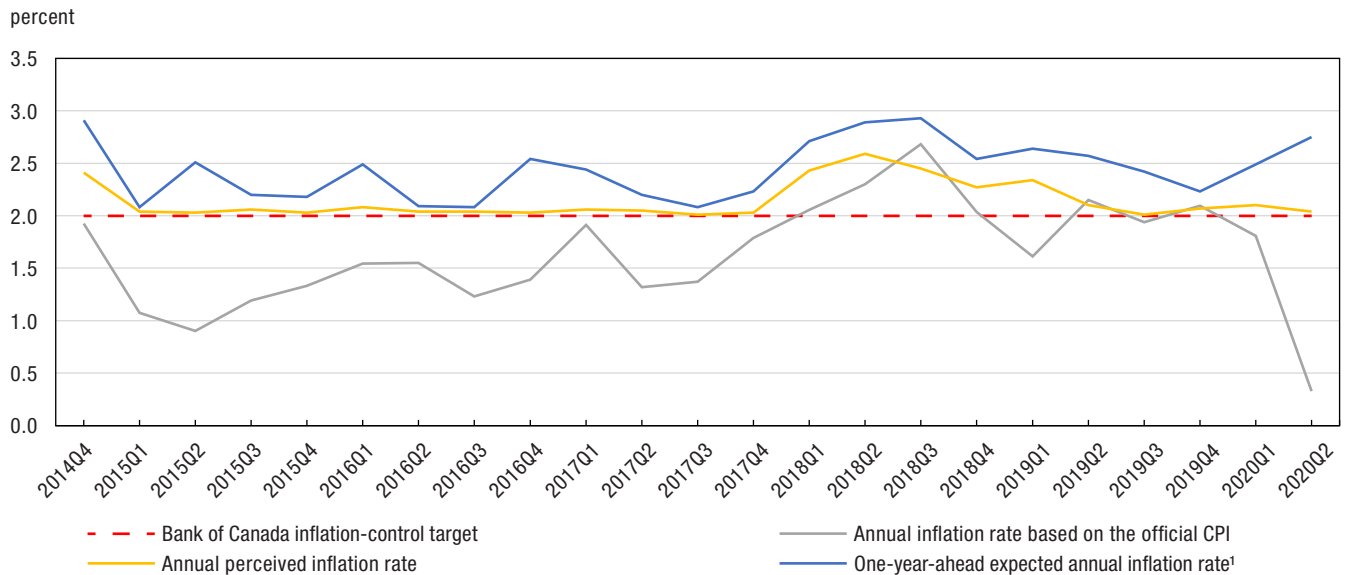
1. Expectations from Canadian firms, financial market participants and professional forecasters are closer to CPI inflation than those of Canadian consumers.

2. The perception-measurement gap in Canada, as observed from the CSCE data, seems less severe than in the United States based on the New York Federal Reserve Bank's Survey of Consumer Expectations data (refer to [Bellemare, Tossou and Moran \(2020\)](#)).

Behavioural factors

- Views on some price components
- Lack of appreciation for quality changes, especially improvements
- Frequent purchases
- Large price increases

Chart 1
Bank of Canada's inflation control target, inflation rate based on the official CPI, perceived and expected inflation rates, Quarterly, 2014 to 2020



1. Reflects the inflation rate consumers expect for the following year at the time they respond to the CSCE survey.
 Sources: Statistics Canada, Consumer Prices program and Bank of Canada's Canadian Survey of Consumer Expectations (CSCE) program.

2. Representativeness of the expenditure basket weights used in the CPI aggregation

This section reviews if there are differences in experienced inflation rates among socio-demographic household groups and if this could explain the perception-measurement gap.

When consumers form their perceptions of inflation, they likely refer to their own experiences of changes in the cost of living, and that experience could be different for each socio-demographic group. The CPI, as a multipurpose indicator cannot fully meet the needs of all users and uses, and it may not represent the best possible measure of changes in the cost-of-living.

The CPI measures price changes for its entire target population³ and is based on the average Canadian's consumption pattern, instead of a specific household or household group. For example, a household either owns its accommodation or rents it, may or may not face child care expenses or university tuition fees; however, all these expenditure categories are included in the CPI basket of goods and services. As such, consumers may feel that the price changes they face do not match the inflation rate as measured by the CPI. The CPI inflation rate cannot be expected to reflect the inflation experience of any one Canadian consumer.

3. The CPI target population is the group of people whose consumption expenditures are in the scope of the index. For the Canadian CPI, the target population consists of families and individuals living in urban and rural private households in Canada. For more details and exclusion to this general definition of the target population, refer to the [Canadian CPI reference paper](#).

Alternative inflation rates are calculated for selected household groups and compared to the overall CPI inflation rate and to the groups' perceptions of inflation. These groups are:

- Households that are homeowners
- Households that are renters
- Lower income and higher income households⁴
- Households with university level education and those without
- Households with children under the age of 18
- Household profiles based on gender, and
- Age groups defined as youth (age 18-30); middle-aged (age 31-54); and seniors (age over 55).

Expenditure weights estimated for these groups⁵ are used to estimate group-specific CPI series that reflect the consumption pattern of each group (Approach 1).

Expenditure weights pertaining to individual households are also used to estimate household-specific CPIs and inflation rates^{6, 7, 8} (Approach 2), which is comparable to using the [Personal Inflation Calculator](#).^{9, 10}

The alternate inflation measures based on Approach 1 or Approach 2¹¹ track the official CPI inflation rate very closely. The dynamics and the magnitude of inflation rate would have been nearly the same if the CPI were calculated using these approaches.

2.1 Inflation rates based on household group-specific expenditure weights (Approach 1)

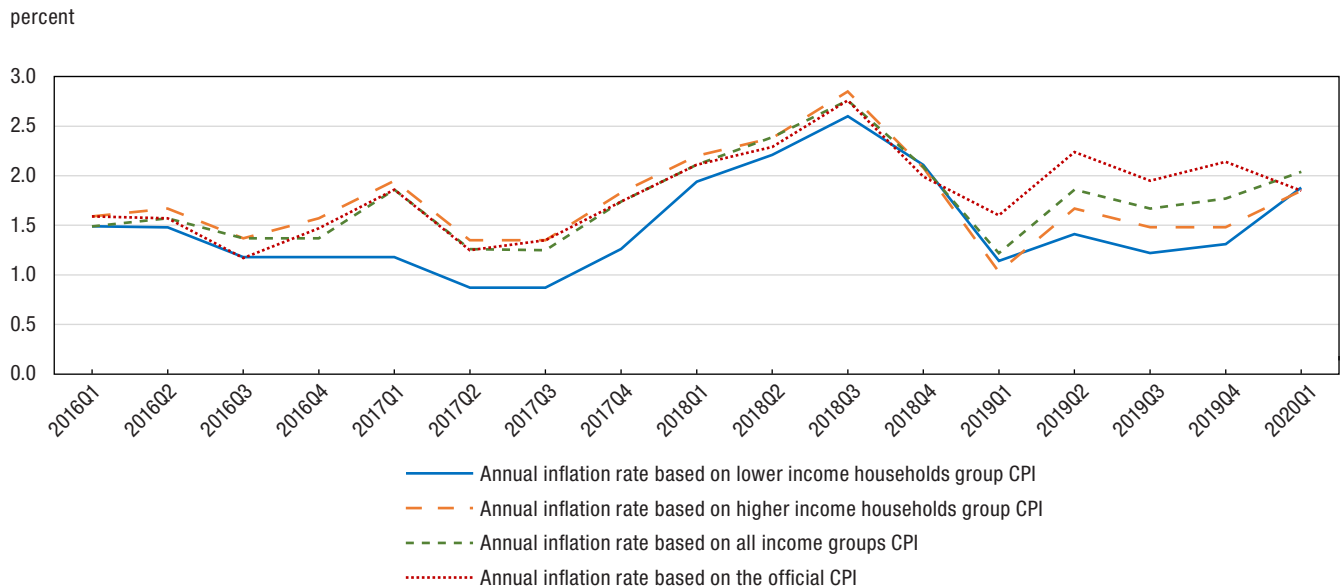
Using Approach 1, the differences of inflation rates among household groups are small and do not represent a significant contribution to the perception-measurement gap.

Lower-income households experienced slightly weaker inflation than higher-income households

For instance, the average inflation rate estimated for lower-income households is only slightly weaker than that calculated for higher-income households (Chart 2).¹² Compared to higher-income households, lower-income households spend a higher proportion of their total expenditures on shelter (33.1% vs. 23.7%) and a lower proportion of their total expenditures on transportation (15.4% vs. 21.9%) as well as on recreation, education and reading categories (9.9% vs. 12.8%). Shelter inflation for the lower-income group is lower compared with the higher-income group.¹³ Thus, a combination of a larger expenditure share on shelter and a weaker shelter inflation contributed to a slightly weaker total inflation for the lower-income households group.^{14, 15}

4. The lower income households profile consists of all households with a total income lower or equal to the 1st quintile of the distribution of total household income as estimated from the Survey of Household Spending (SHS) for each survey year. The higher income household profile consists of all households with a total income higher than the 4th quintile of the distribution. Provincial level distributions of household income are used. The lower income group generally has a share of about 12% in total household expenditure within each province. This share is around 32% for the higher income group.
5. For the household groups CPI, we also used alternate data sources in addition to the SHS data for the estimation of expenditure weights for mortgage interest and replacement cost.
6. These estimates were performed only for the households who responded to the diary portion of the SHS questionnaire; they represent about 40% of the entire SHS sample in each survey year.
7. For the household-specific CPI, the mortgage interest cost and replacement cost categories are excluded from the expenditure weight estimation for the household-specific CPI calculation.
8. The statistical quality of the expenditure weight estimates for household groups and for specific households is similar to the quality of the official CPI basket weights.
9. The [Personal Inflation Calculator](#) is an inflation estimator meant as a guide to help individual consumers understand their unique experience of inflation. It is not an official statistic and should not be used as a substitute for the official CPI.
10. Note that the results of the [Personal Inflation Calculator](#) are obtained using the current period expenditure shares, as estimated by the user, to calculate the price index for all past months, which corresponds to the Paasche index aggregation formula. The official CPI and the alternative indexes calculated in this study use aggregation weights that are normally updated every two years to reflect changing spending shares, and correspond to a Laspeyres-type (Lowe) index aggregation formula.
11. Both Approach 1 and Approach 2 assume that all households face the same prices and therefore the same price changes for all individual products. Although consumers from different household profiles or specific households shop for different brands or at different shopping channels, no price data is available at the household or household profile level. The indices analysed in this study were calculated by applying alternative expenditure weights to the lowest level indices of the official CPI.
12. The headline CPI without recreational cannabis fell in between the inflation rates for the two income groups. Recreational cannabis was introduced in the official CPI in January 2019. However, expenditure data on cannabis were not available at the household profile level; so this CPI aggregate is not included in the household profile or household-specific price indexes calculated in this study.
13. The difference in shelter is mainly due to rent and owner occupied housing. Most low-income households are renters whereas most high-income households are home owners. Rent inflation is weaker than that of owner occupied housing, thus low-income households experienced weaker shelter inflation compared to high-income households.
14. See footnote 4 for a definition of income groups.
15. Starting from the first quarter of 2019, the headline CPI inflation rate was above the inflation rates for both income groups due to recreational cannabis not accounted for in the index calculation for the two income groups.

Chart 2
Annual inflation rate based on the official CPI and by income group,¹ Quarterly, 2016 to 2020



1. Income groups are formed based on income distribution by province and territory. Expenditure weights estimated for each group are used to calculate a consumer price index series specific to that group.
Source: Statistics Canada, Consumer Prices program.

Looking at other household groups, renters have experienced slightly lower inflation than homeowners, and so do households with no university degree relative to those with one. The inflation experience of households with children under 18 closely resembles the official CPI inflation rate.

2.2 Average of inflation rates based on household-specific expenditure weights (Approach 2)

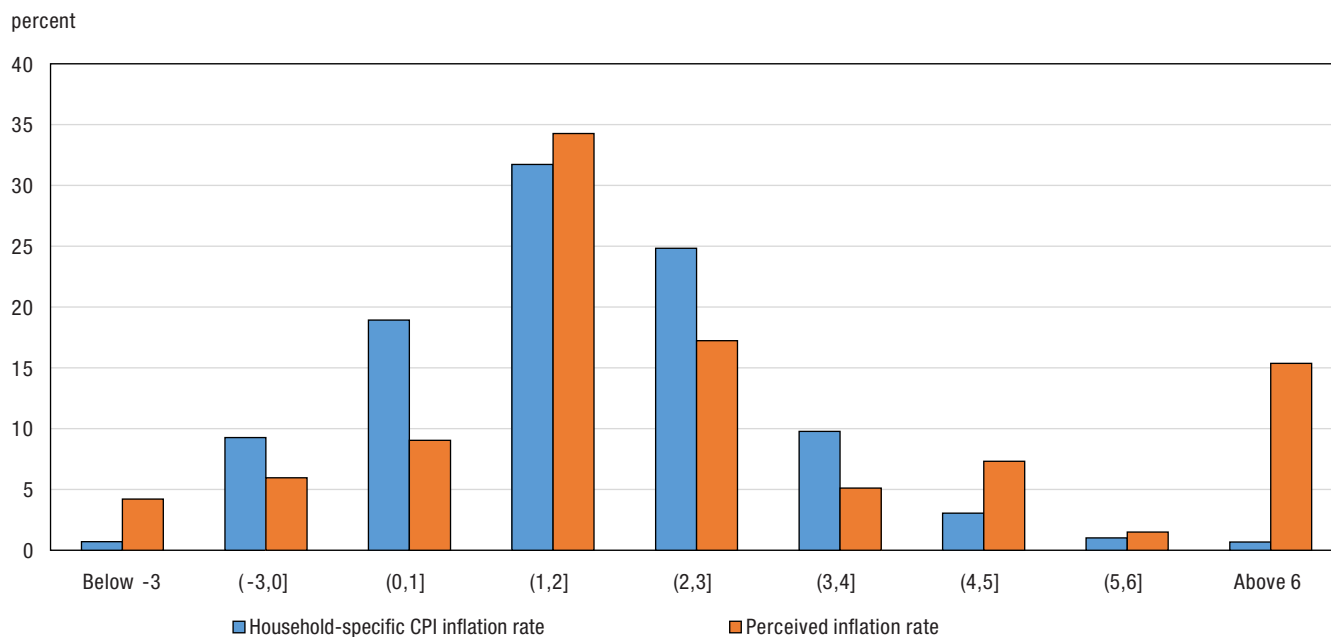
Overall, consumers’ perceptions about inflation do not match estimated inflation rates. On average, estimated inflation is similar across age groups. However, youth have higher and more volatile inflation perceptions relative to other age groups.

Using the mean or the median of the distribution of household-specific inflation rate within age groups, the overall inflation rates for the three age groups track each other very closely and are similar to the headline CPI inflation rate. This result contrasts with the distribution of inflation perceptions within age groups. For instance, consumers aged 31 and up displayed a stable perceived inflation rate around 2%, while younger consumers have higher and more volatile perceptions of inflation.

Larger proportions of perceived inflation rates are higher than 4% while larger proportions of household-specific inflation rates are lower than 1%.

The majority of household-specific inflation rates and perceived inflation rates are within the Bank’s inflation-control target range of 1% to 3% (Chart 3). However, perceived inflation rates above 4% have been reported by a significantly higher proportion of the Bank of Canada’s CSCE survey participants (about a quarter vs. less than 5% for estimated inflation rate). Household-specific inflation rates below 1% have been reported for a significantly higher proportion of the SHS diary respondents (nearly 30% vs. nearly 20% for perceived inflation rate)¹⁶ (Chart 3).

16. Proportions estimated using SHS and CSCE data may not be comparable due to differences in the survey sampling designs.

Chart 3**Distributions of annual perceived inflation rate and annual household-specific CPI inflation rate, first quarter of 2020**

Sources: Statistics Canada, Consumer Prices program and Bank of Canada's Canadian Survey of Consumer Expectations.

In summary, consumers' experience of inflation not only depends on the price movements of the commodities they purchase, but also depends on their respective expenditure shares of these commodities. The inflation rates estimated for the different household groups are very similar to the overall official CPI inflation rate. This result supports the conclusion of a previous [study](#) on consumer price index for seniors, which found that seniors faced similar rates of inflation as the average Canadian.¹⁷ Consumers' perceptions of inflation among specific household groups, however, do not match their estimated inflation rates.

3. Quality adjustment of prices used in the CPI

To accurately measure pure price change, the quality of goods and services in the CPI product sample needs to be the same or equivalent over time. However, the quality of certain products—such as electronics, cars and internet services—is constantly improving, while prices may be increasing. Thus, measured price changes need to be adjusted for quality changes.¹⁸

Consumers' perceived rate of inflation may be different from the official inflation measured by CPI if they are not accounting for quality changes for the products they purchase. This is especially true in markets with high technological change (electronics, internet services).

To illustrate the difference between measured and perceived inflation, we have chosen select products (including goods and services), estimated the non-quality adjusted indexes¹⁹ and compared those with the official quality adjusted ones.

For internet access services, quality adjustments are done using a hedonic approach.²⁰ The average internet prices (non-quality adjusted index) have increased after 2018 as a result of marked increases in upload and

17. The consumer price index for seniors is calculated using an expenditure weight distribution that is specific to seniors' households and assuming that all households face the same prices for all individual goods and services.

18. For simple illustrations of the need for quality adjustment in the CPI calculation, refer to the infographic, "[Measuring pure price change in a constantly changing world](#)", available on Statistics Canada's website.

19. Extracting the impact of quality adjustment on prices is a very challenging task, especially for products with high product churns. An accurate estimation of the overall impact of quality adjustment on the CPI requires a thorough research that could not be conducted during the current study.

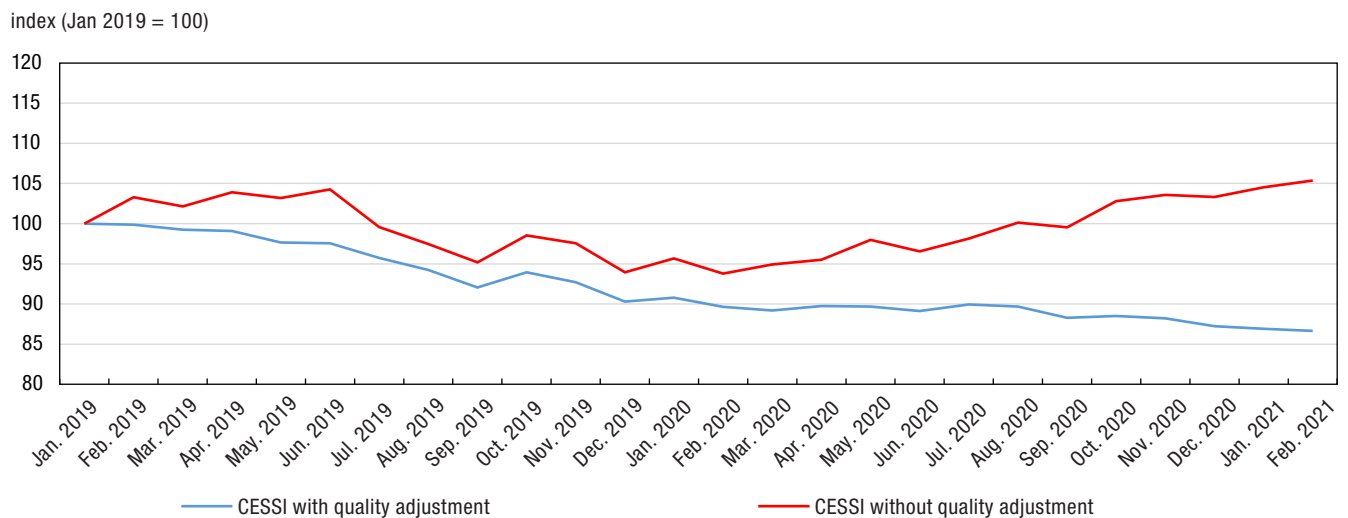
20. Please refer to chapter 7 of the [Canadian CPI reference paper](#) for further explanations of hedonic quality adjustment methods.

download speeds, while the internet access services price index based on quality adjusted prices remained stable. This is because the quality-adjusted index considers these improved characteristics.

For computers, equipment, software and supplies index, there are constant positive technological changes in the corresponding products. The quality adjusted series show a downward trend while the raw data do not²¹ (see Chart 4).

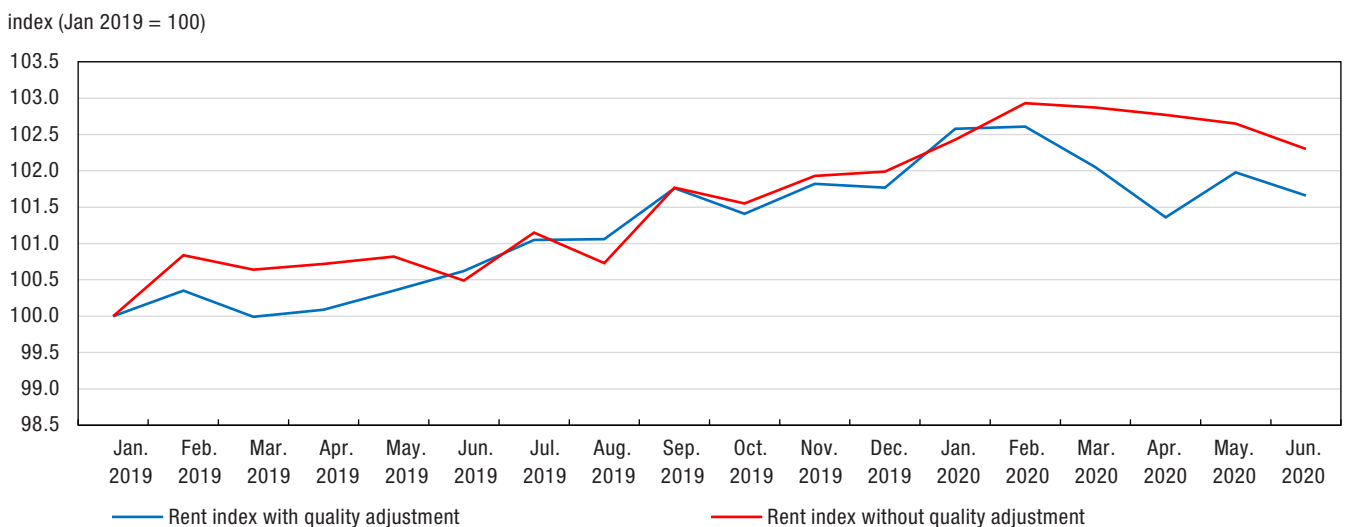
In the case of rent price index, quality adjustments do have some effect on the final measured prices, however, they closely follow the observed average prices (Chart 5).

Chart 4
Computer equipment, software and supplies index (CESSI) with and without quality adjustment, Monthly, January 2019 to February 2021



Source: Statistics Canada, Consumer Prices Program.

Chart 5
Rent index with and without quality adjustment, Monthly, January 2019 to June 2020



Source: Statistics Canada, Consumer Prices Program.

21. For this exercise, unmatched models are used to estimate non-quality adjusted index series.

Chart 6 presents the distribution of the CPI product categories according to the type of quality adjustment. Around one sixth of the basket is subject to regular positive adjustment (green slices).²²

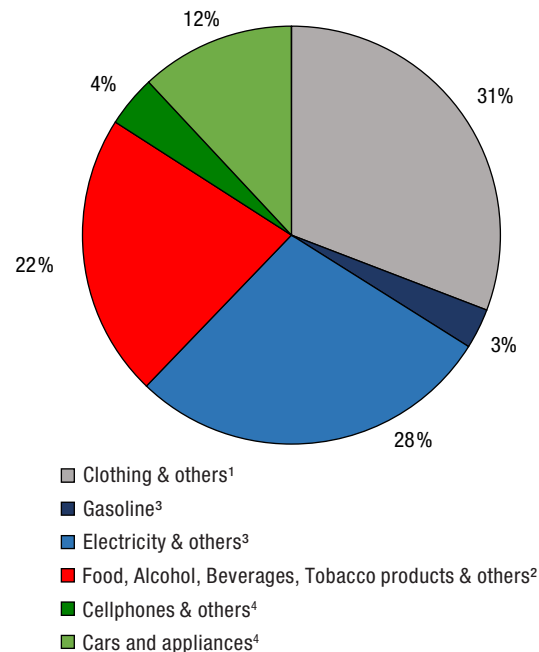
Looking at the remaining five sixths of the basket (grey, blue and red slices):

- Prices for some other CPI components may be adjusted upward following a drop in quality (e.g. clothing).
- Not all goods or services experience quality changes or improvements over time. For example, gasoline has mostly the same quality and as such, gasoline prices do not need any quality adjustment to be applied.²³
- Certain types of quality adjustment deal with standardization, e.g., size, weight and packaging, and are mostly applied to food products, which can go either way (up or down). As an example, we have found that since 2019, the inflation rate for cheese using non-quality adjusted prices is lower than the official inflation rate for cheese.

The net impact of quality adjustment on the overall CPI inflation is not clear and cannot be easily estimated.

Chart 6

Categories of CPI goods and services by basket weight, using similar quality adjustment techniques



1. Subject to positive or negative quality adjustments ("others" includes furniture and rent).

2. Subject to adjustments mostly for changes in size, weight or unit ("others" includes hygienic, medicinal and pharmaceutical products).

3. No quality adjustments ("others" includes water, fuel oil, public transportation, insurance, books, and many recreational services).

4. Subject to regular positive quality adjustments ("others" includes audio and video equipment and telecom services).

Source: Statistics Canada, Consumer Prices program.

In general, there is no systematic difference between price indices based on quality-adjusted prices and their counterparts based on non-quality adjusted prices. However, on average, inflation rates based on non-quality adjusted prices series are slightly higher for some CPI categories such as computer equipment and software or refrigerators. As such, it seems that the impact of the quality adjustment on overall CPI could be positive but small, and could only explain a modest portion of the perception-measurement gap. Statistics Canada will conduct more research in the future to extract and analyze the potential impacts of quality adjustments on specific products, as well as on the overall CPI.

22. A positive quality adjustment is a price adjustment performed on a product that consistently improves in quality over time. The resulting quality adjusted price index is higher than the price index using unadjusted prices.

23. Please refer to chapter 7 of the [Canadian CPI reference paper](#) for further explanations of different quality adjustment methods.

4. The cost of a house vs. the cost of housing services in the Canadian CPI

Shelter services represent an important category of consumer spending in Canada. In the CPI basket, owned accommodation (OA) typically accounts for more than half of total spending on shelter services. However, estimated OA expenditure weights and price movements are critically dependent on the approach used for their measurement. The treatment of OA in the CPI is an essential part of the debate over how to explain the gap between perceived and measured inflation. When households think about changes in the price of housing, they likely refer to how much it costs to buy a house and less likely to how much it costs to own (or use) a house. The difference between the price of a house and the cost of housing services can be a source of confusion that could contribute to the gap between perceived and estimated CPI inflation.

This part of the study addresses the following questions:

- Is the public confusion between cost of houses and cost of housing services a contributing factor for the perception-measurement gap?
- How should the owned accommodation be measured in the CPI? Should it reflect the cost of houses or the cost of housing services?

4.1 Approaches to the treatment of owned accommodation in the CPI

One of most complex and difficult questions is how should statistical agencies treat the owned accommodation in their CPI. Statistics Canada's owned accommodation price index is designed to detect the impact of price changes on homeowners' specific cost of shelter. Homeowners' specific cost of shelter has the following components: replacement cost or depreciation cost,²⁴ mortgage interest cost, property taxes, the cost of homeowners' insurance, the cost of homeowners' maintenance and repair, and other ongoing costs related to owning the accommodation. This approach considers a house as an asset rather than a consumer good. Therefore, the prices reflect the costs incurred by the homeowner to use and maintain the home, but not the purchase price of the home.

Changes in housing prices affect most of these components. For example, they directly affect the mortgage interest cost and replacement cost,²⁵ as the housing price is part of their price index calculations. They indirectly impact the property taxes and homeowner insurance premium through changes in the property assessment values and the replacement cost of houses.

In Australia, the Australian Bureau of Statistics applies the **Acquisitions approach**, in which the owned accommodation service is treated similarly to other durables in the CPI such as passenger vehicles. In the CPI basket, all expenditures on housing purchases by Australian households are attributed to the period of purchase, even though the use of the purchased house extends beyond that period.

Finally, three alternative approaches are possible. Many statistical agencies²⁶ use the **Rental Equivalence Approach**, in which services obtained from owned accommodation are based on their rental values. This approach requires getting information from the rental market.²⁷ Other statistical agencies²⁸ use the **User Cost Approach**, in which they include actual and imputed costs²⁹ of owned accommodation services. Some countries³⁰ do not include any imputed costs components. Only actual cash costs are thus included, applying the **Payments approach**, a variant of the user cost approach.

24. This is the amount of owned accommodation that is assumed to be used up.

25. Dion and Sabourin (2011) find mortgage interest cost and replacement cost significantly sensitive to housing price movements.

26. Bureau of Labor Statistics, USA, Office for National statistics, UK, Federal Statistical Office, Germany, National Institute of Statistics and Economic Studies, France use Rental equivalent approach.

27. Imputations must be made with this approach, using paid rents as a proxy for equivalent rents.

28. Sweden and Iceland Statistical agencies use user cost approach applying different formulas.

29. An owner would incur interest costs during the period of ownership (actual interest costs on mortgage and/or forgone rate of return on owned funds which could otherwise have earned interest.), a replacement cost, and other operating costs. Offsetting these expenses would be an expected capital gain which represents the expected selling price at the end of the year less the purchase price.

30. Ireland's Central Statistics Office uses the payments approach.

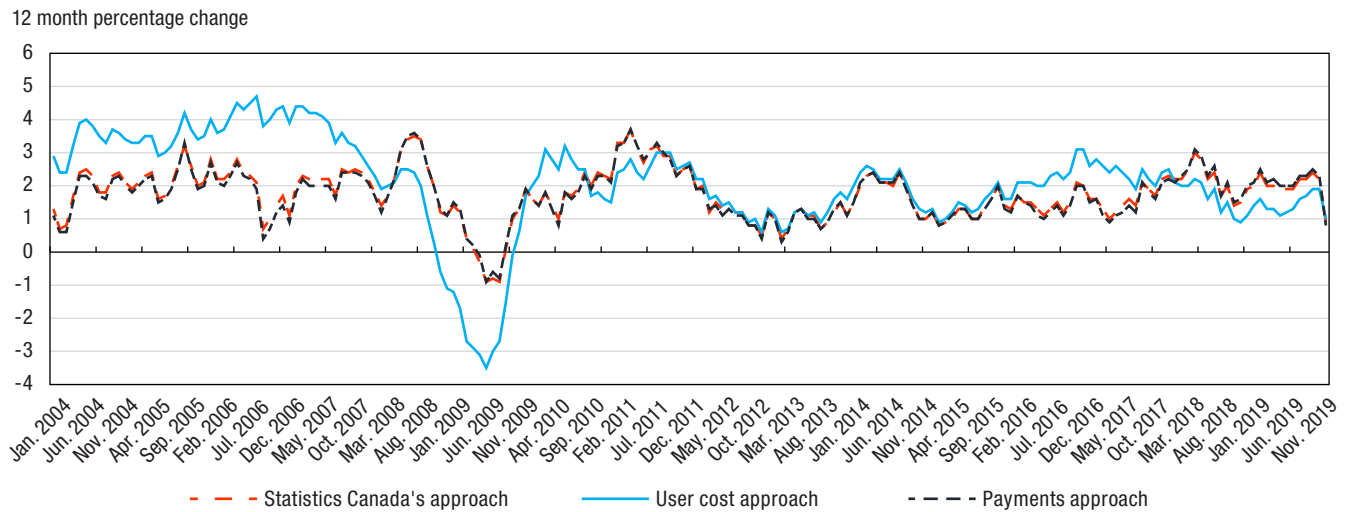
4.2 Alternative approaches to the treatment of owned accommodation have varying impacts on the all-items CPI

In this section, the proportional expenditure weights for the owned accommodation component based on the different approaches are derived for 2001, 2005, 2009, 2011, 2013, 2015, and 2017 CPI basket reference years. Over time, the expenditure shares based on the Statistics Canada’s approach, the payments approach and the rental equivalence approach vary much less than the estimates based on the user cost and acquisitions approach.

Inflation rates based on the payments approach are similar to the headline inflation rates, however for the user cost approach they display higher variability over time. The all-items CPI annual inflation rate using the rental equivalence approach for the owned accommodation component is lower than the official headline inflation rate, while the inflation rate based on the acquisitions approach is remarkably higher than the official headline inflation rate (Chart 7 and Chart 8). This is because rising housing prices are more importantly reflected in the inflation rates based on the acquisitions approach.

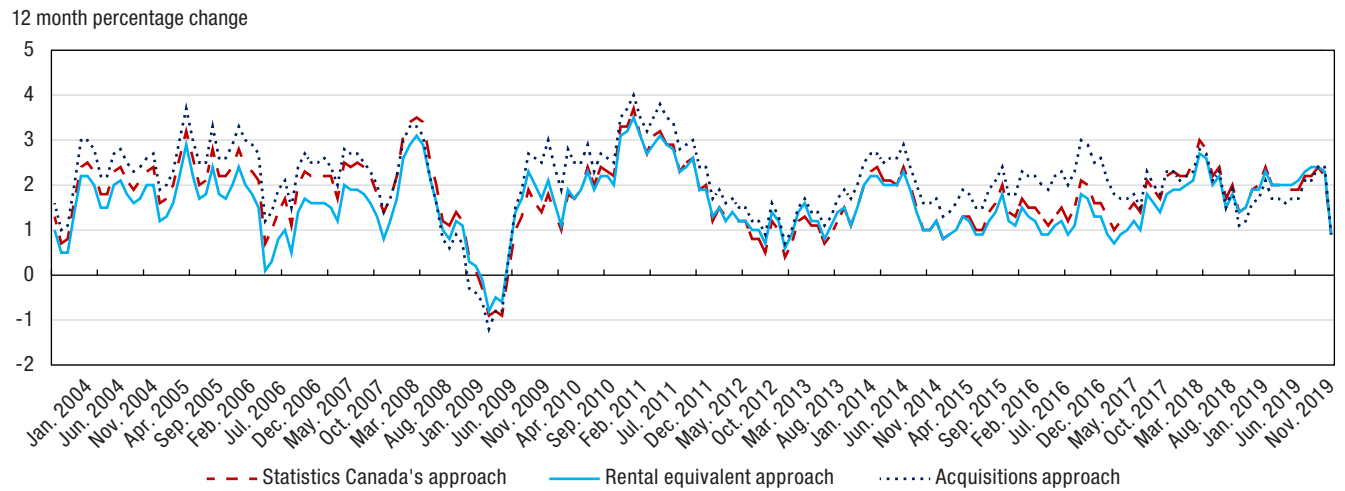
Chart 7

Year-over-year percentage change in All-items CPI using Statistics Canada's approach, user cost and payments approaches for the owned accommodation component, Monthly, 2004 to 2020



Note: Last observation: March 2020.

Source: Statistics Canada, Consumer Prices program.

Chart 8**Year-over-year percentage change in All-items CPI using Statistics Canada's approach, rental equivalent and acquisitions approach for the owned accommodation component, Monthly, 2004 to 2020**

Note: Last observation: March 2020.

Source: Statistics Canada, Consumer Prices program.

Hence, the acquisitions approach may be helpful in reducing the perception-measurement gap. This may better reflect how consumers perceive their cost of living owing to the cost of houses. It is relatively easy to implement in the CPI compilation as it essentially relies on housing transaction prices. However, OA expenditure shares and housing transaction prices may vary considerably over time and by geographic locations. In addition, the inflation rate based on this approach would be more volatile over time, not a positive feature for monetary policy. It should be noted that this approach is not consistent with the concept of cost of housing services. Rental equivalence and user cost approaches are more aligned with the concept of cost of housing services, but the all-items CPI generated with user cost approach is far more volatile than the official index, reflecting the inconsistent impact of expected capital gain price changes on the OA estimates. The treatment of OA in the Canadian CPI³¹ represents an acceptable compromise in the current environment of relatively low and stable inflation.

5. Psychological and behavioural factors

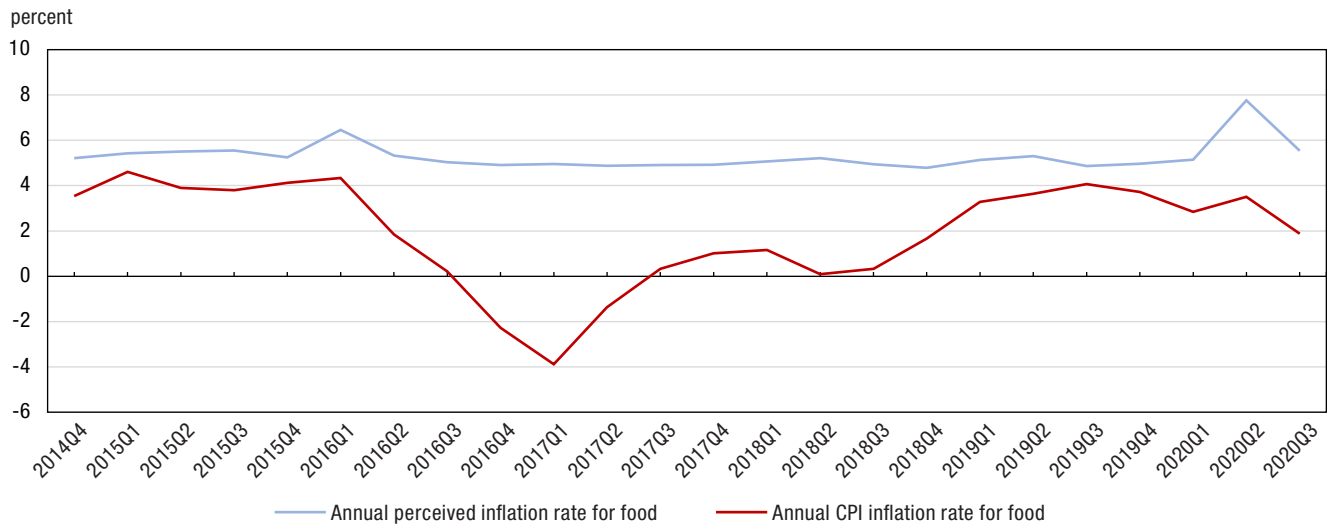
Overall, the measurement issues reviewed so far seem to explain a small fraction of the perception-measurement gap. Other behavioral factors might also be at play and we explore them next.

Consumers' views of some price components

Inflation perceptions might be determined by consumers' own view of a small set of products and services. In particular, analysis using the CSCE suggests that views about inflation tend to be driven by changes in food prices, the cost of renting and house prices. Perceptions about food and rent inflation are likely based on an individual's own experience, and on average are much higher than the actual CPI inflation rates for these components (Chart 9 and Chart 10). This factor contributes to explain part of the positive bias in perceived inflation rates. About 0.7 percentage points of the 1.0 percentage points gap could be explained by higher perceived inflation for food and rent (average perceived inflation rates are 5.5% and 5.3% while average CPI inflation rates are 1.9% and 1.2% for food and rent, respectively, since 2014).

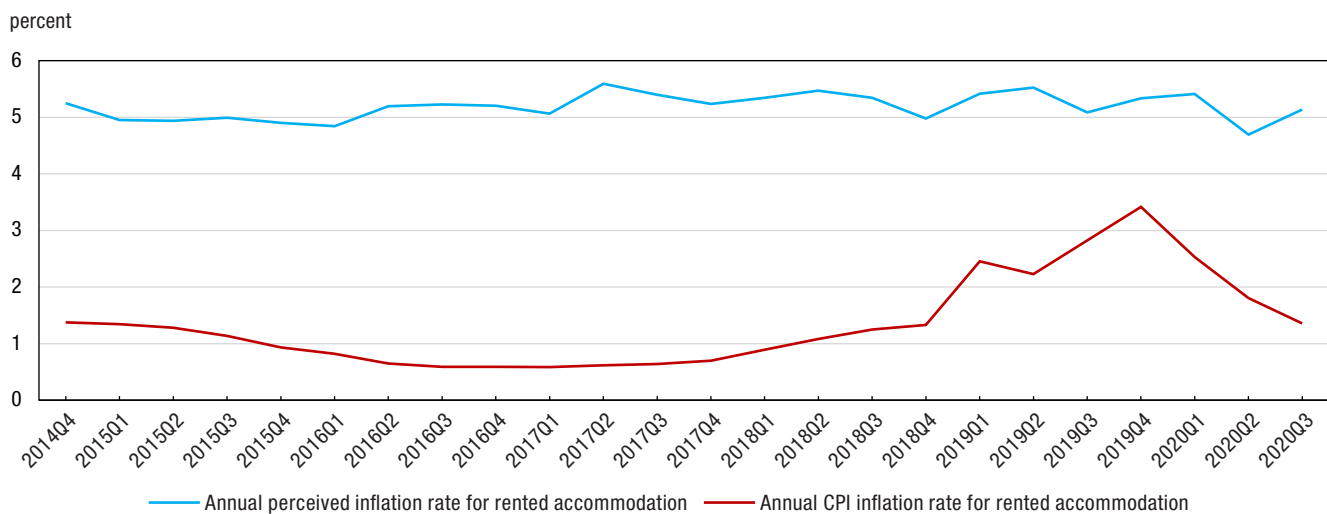
31. Our approach is a hybrid approach combining user cost and payments approach and, as such, it is unique. Sweden and Iceland use user cost approach applying different formulas.

Chart 9
Annual perceived inflation rate and CPI inflation rate for food, Quarterly, 2014 to 2020



Sources: Statistics Canada, Consumer Prices program and Bank of Canada's Canadian Survey of Consumer Expectations.

Chart 10
Annual perceived inflation rate and CPI inflation rate for rented accommodation, Quarterly, 2014 to 2020



Sources: Statistics Canada, Consumer Prices program and Bank of Canada's Canadian Survey of Consumer Expectations.

Frequent purchases

Recent shopping experience and frequent purchases may also affect households' inflation perceptions. Using US transaction data, D'Acunto, Malmendier, Ospina and Weber (2019) find that household-specific grocery-price changes shape consumers' inflation expectations, with stronger impact from price changes of the frequently purchased goods.³² For Canada, Statistics Canada computed the CPI inflation for frequent purchases at the

32. Perceptions about inflation are strongly linked to inflation expectations. Higher perceptions about inflation lead to higher expectations.

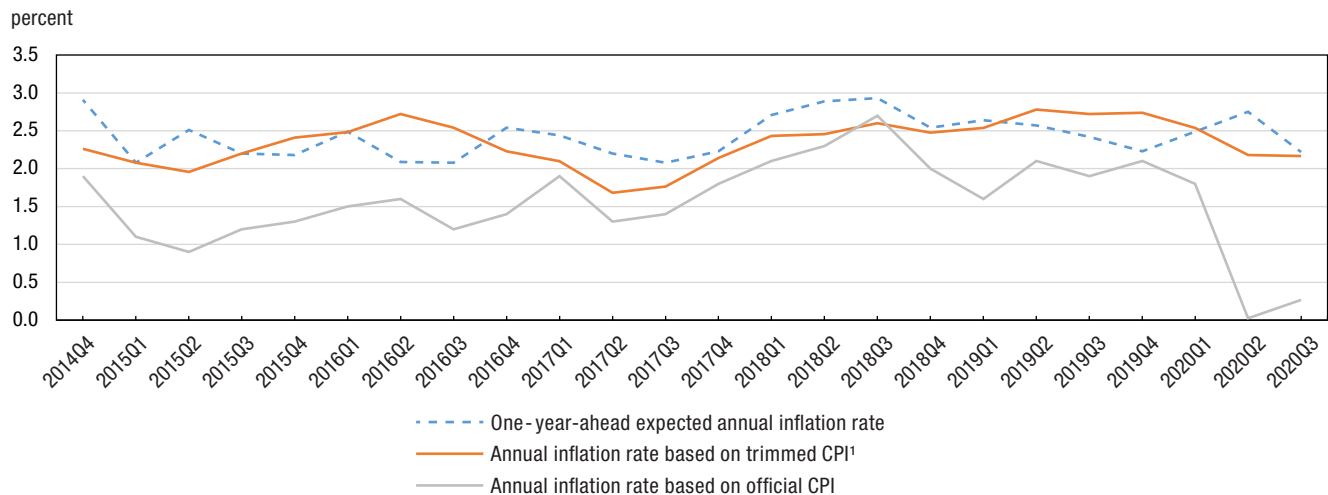
aggregate level.³³ Over the past five years, the inflation rates of frequent purchases have been weaker than the inflation rates of the all-items CPI and so likely does not explain the gap with perceived inflation at the aggregate level (the perception gap is in fact amplified by about 0.2 percentage points on average by comparing perceived inflation with inflation from frequent purchased items).

Large price increases

Large price changes, especially large increases, may have a stronger impact on households' views about inflation. This is because rising prices are more salient for consumers than declining and stable prices. To test this, an alternative CPI inflation is measured by trimming 20% of price declines and 10% of price increases by CPI basket weight. Households' inflation views are very close to this alternative measure of inflation (Chart 11). This suggests that consumers weigh price increases more heavily and that excluding a larger proportion of extreme price declines than price increases could explain a significant part of the gap between inflation and these views (gap is narrowed from 0.8 percentage points to only 0.1 percentage points when perceived inflation is compared to this trimmed index instead of CPI-all item).

Chart 11

Official annual inflation rate, one-year-ahead expected annual inflation rate and annual inflation rate excluding extreme price changes, Quarterly, 2014 to 2020



1. Trimmed CPI is calculated by excluding largest 20% of price declines and largest 10% of price increases by CPI basket weight.
Sources: Statistics Canada, Consumer Prices program and Bank of Canada's Canadian Survey of Consumer Expectations.

The role of knowledge and information

One explanation for the behaviour of firm and household inflation views could be related to information problems. When information is not readily available or too costly to acquire, individuals rely on their personal experiences to form perceptions and expectations. This lack of information about economic developments and policy changes might explain part of the perception-measurement gap.

Central banks and other authorities have a role to play in providing information. The Bank of Canada's analysis shows that individuals update their views of inflation with new information, with notable impacts from information about the Bank's inflation target and inflation forecasts by the Bank and professional forecasters.³⁴ Information about the inflation target and past inflation has the most lasting impact on expectations.

33. Frequent purchases are goods and services that consumers generally purchase on a monthly basis, or more frequently, and whose transaction price has not been contractually determined more than a month in advance (examples are food, utilities, personal care items, alcohol, tobacco products).
 34. The analysis compares respondent's views about inflation before and after they are provided with information treatments about past inflation, inflation target, Bank's forecast and forecasts of professional forecasters. Similar studies have been done in the U.S. (Coibion, Gorodnichenko and Kumar (2018), Coibion, Gorodnichenko and Weber (2018), Coibion, Gorodnichenko and Ropele (2020)).

Knowledge is also important, as individuals with higher financial and economic literacy having inflation expectations closer to measured inflation. In this context, developing communication strategies to reach a broader audience and increase financial and economic literacy is worth exploring.

6. Conclusion

Canadians' views of inflation are above actual CPI inflation, and more so for certain demographic groups. While measurement factors can explain part of this gap, behavioral factors appear to be playing a larger role. Information gaps or limited economic literacy can partly explain the way inflation is perceived. Central banks and other authorities can play a role to make information more readily available and to support economic literacy. Statistics Canada and the Bank of Canada will continue their analysis of the CSCE data and develop communication strategies to help Canadians in their efforts to better understand consumer inflation and its measurement methods.

References

- Bellemare, C., Tossou, R. K. and Moran, K. (2020). "[The Determinants of Consumers' Inflation Expectations: Evidence from the US and Canada.](#)" *Staff Working Paper/Document de travail du personnel* – 2020-52, Bank of Canada.
- Coibion, Olivier, Yuriy Gorodnichenko, and Saten Kumar. (2018). "[How Do Firms Form Their Expectations? New Survey Evidence.](#)" *American Economic Review*, 108 (9): 2671-2713.
- Coibion, Olivier, Yuriy Gorodnichenko and Ropele, Tiziano. (2020). "Inflation Expectations and Firm Decisions: New Causal Evidence." *The Quarterly Journal of Economics*, 135, issue 1, p. 165-219.
- Coibion, Olivier, Yuriy Gorodnichenko and Michael Weber. (2019). "Monetary Policy Communications and their Effects on Household Inflation Expectations." *NBER Working Paper* 25482.
- D'Acunto, Francesco, Ulrike M. Malmendier, Juan Ospina and Michael Weber. (2019). "Exposure to Daily Price Changes and Inflation Expectations." [CESifo Working Paper Series](#) 7798, CESifo.
- Dion, Richard and Patrick Sabourin. (2011). "Measures of Owner-Occupied Housing in the CPI: Properties and Limitations in the Canadian Context." Bank of Canada, unpublished document.