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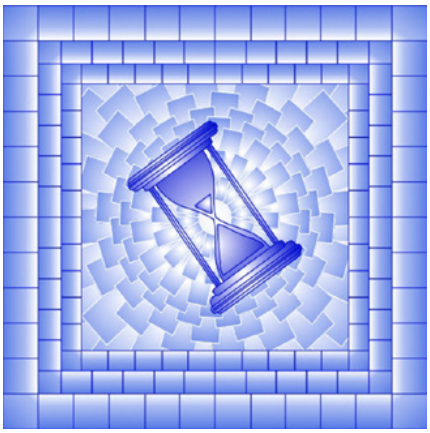
Measuring price change for used vehicles in the Canadian Consumer Price Index



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Measuring price change for used vehicles in the Canadian Consumer Price Index

Key messages

- Introducing used vehicle prices in the Consumer Price Index (CPI) is part of Statistics Canada's commitment to provide the most timely, reliable and accurate data which reflects the experience of Canadians.
- As part of Statistics Canada's rigorous and ongoing efforts to maintain the quality and relevance of the CPI, this technical paper explains the proposed timing, data and methodology for including the prices of used vehicles in the CPI's purchase of passenger vehicle index.
- Statistics Canada has identified a reliable data source for the prices and characteristics of used vehicles, and the upcoming annual basket update in June will incorporate this new source of data in its calculation of the CPI. The CPI previously accounted for used vehicle prices by including a weight for used vehicles and using new vehicle prices as a proxy.
- We will continue to monitor prices for used vehicles and leverage additional new data sources for the purchase of passenger vehicles index. This will ensure the CPI remains an accurate, robust and relevant means of measuring inflation.

The Consumer Price Index (CPI) measures the change in the cost of a fixed basket of consumer goods and services over time. To accurately reflect trends in the market and consumer behavior, Statistics Canada periodically updates the methods and sources applied to various components of the CPI.

The purchase of passenger vehicles index in the CPI measures the average change over time in the prices of passenger vehicles. It comprises 6.21% of the 2020 CPI basket. The weight of the purchase of passenger vehicles index comprises household expenditures on new vehicles, plus net household expenditures[1] on used vehicles, which alone make up between one quarter and one third of the 6.21% weight share of the purchase of passenger vehicles index.[2] Currently, Statistics Canada uses new vehicle prices to estimate the entirety of the purchase of passenger vehicles index, effectively using new vehicle prices as a proxy for used vehicle prices.

Amid the COVID-19 pandemic, a divergence in price movements for new and used cars was observed in several countries, particularly the United States. Supply chain disruptions, notably for the semiconductor chips used in various components of newly manufactured vehicles, and pandemic-related plant closures continue to impact the manufacture of new vehicles, leading to reduced inventories. With fewer new cars and trucks available for purchase and lengthy delays for delivery of new vehicles purchased, consumers have sought out used cars, driving up demand. At the same time, fewer consumers are trading in their used models, creating a supply shortage in the used vehicle market. These shifting market dynamics have, consequently, resulted in steeper price increases for used vehicles than for new vehicles. This divergence in the price movements indicates that new vehicle prices no longer serve as an effective proxy for used vehicle prices in the Canadian CPI. Statistics Canada recommends to introduce enhancements to the calculation of the purchase of passenger vehicles index by including used vehicle prices. The enhancement would be implemented with the CPI basket update on June 22, 2022. At the same time, used passenger vehicles will be added to the CPI basket as a published aggregate.

Enhancements to the index

In order to better measure price change for passenger vehicles, enhancements will be made to the index including:

1. A net expenditure approach, i.e., total household expenditures less revenues from the sale of households' used vehicles, is used to reflect the fact that households can sell and purchase in the used vehicle market. This approach is recommended in paragraphs 11.170-11174, p. 256-257 of the *Consumer Price Index Manual* (imf.org).
2. Used vehicles make up approximately one quarter of the 6.21% weight of the purchase of passenger vehicles index, based on 2020 expenditures. Updated values, based on 2021 expenditures, will be published with the updated CPI basket weights on June 15, 2022.

- the creation of two new elementary aggregates for the purchase of new passenger vehicles and the purchase of used passenger vehicles as components of a single purchase of passenger vehicles index
- the use of a reliable data source for used vehicle prices and characteristics
- the introduction of appropriate modelling to calculate a used vehicles index that accounts for quality change and depreciation over time

The transaction data used to price used vehicles will come from JD Power, providing access to prices and characteristics of vehicles (used and new) purchased by households, from dealerships. The monthly transaction data is received as an aggregate such that each make and model of vehicle has a single price[3], vintage age, odometer reading, and the sample transaction count. The price, vintage age and odometer reading are averages that are calculated using weights based on vehicle registrations to ensure their representativeness. Hedonic modelling of vehicle prices is already done by Statistics Canada in the deflation of used motor vehicle prices in the national accounts, though the model isn't applicable to the needs of the CPI. The CPI will use a similar hedonic model, with the main differences involving changes to the specification, weighting, periods of interest, and segmentation. A hedonic approach is employed because used vehicles of the same model type may differ in observable characteristics, such as usage or vintage, meaning that direct price comparisons of the same model type over time may lead to biased estimates. This hedonic approach functions as a measure of change in aggregate vehicle model prices with quality adjustments[4] for aggregates of vintage-age and usage.

Construction of monthly price relatives

The CPI measures pure price change, ensuring that price comparisons are made over time for like products, explicitly accounting for differences in observable quality characteristics. Using transaction data means that a given model of used vehicle, due to its depreciation, may have varying quality between periods. Therefore, in order to control for quality change and estimate pure price change, a hedonic time dummy is employed along a rolling five-month window[5].

The logarithm of price is modeled as a function of the logarithm of vintage-age[6], and logarithm of odometer reading of vehicles, as well as model fixed effects and a dummy variable for each of the last four months of the window. Formally:

$$lnp_{i,}^{class,w,\dots} = \beta_0^{class,w,\dots} + \beta_1^{class,w,\dots} lnOdometer_i + \beta_2^{class,w,\dots} lnAge_i + \sum_{m=1}^{M} \gamma_m^{class,w,\dots} D_i^{model}(\mathrm{m}) + \sum_{t=1}^{T} \delta_t^{class,w,\dots} D_i^{period}(\mathrm{t}) + \varepsilon_i$$

Where:

- observation i is the average set of characteristics (price, odometer, vintage-age) for a class-make-model m sold in a given month t
- these observations are reported nationally, though prices have provincial taxes applied to them
- $D_i^{model}(\mathrm{m})$ is 1 if the model of observation i is equal to m, and zero otherwise
- $D_i^{period}(\mathrm{t})$ is 1 if the sales month of observation i is equal to t, and zero otherwise
- the regression window w is an interval consisting of a current period and $T = 4$ periods back into the past, e.g. if the current period was January, it would be a 5 month interval of September $(t = 0)$ through January $(t = 4 = T)$
- vehicle models are weighted according to estimated expenditures on them during the window, and these weights are constructed separately for each CPI strata

3. The price used here is a transaction price, not a sticker or list price. i.e. it is the cash transacted plus the value of any vehicles traded in for the sale.
4. For additional information on quality adjustment approaches in the CPI and why different approaches are used, users can consult chapter 6 of the international Consumer Price Index Manual: Concepts and Methods (2020).
5. Five months strikes a balance between being short enough such that on one hand parameters are reasonably stable and vehicle models don't have underlying composition changes from trims, while on the other hand ensuring the window is long enough such that nearly all vehicle models are observed enough times to measure model fixed effects separate from time dummy effects, and to not cause too much volatility in the regression weights. It should be noted that a variety of window lengths were tested, and all had similar resulting indices.
6. Vintage being synonymous here with the year of the model. So, if the most recent model year was 2021, and the transacted vehicle had a model year of 2019, the vintage age would be 2.

The regression specification is similar to the methodology employed in the measurement of used car price movements in New Zealand[7]. While the observable characteristics of a given vehicle are not explicitly controlled for, there is relatively little variation within models (mainly coming from different trims), compared to across models. Additionally, the inclusion of explicit characteristics would require the acquisition and processing of additional data each period, which was deemed unfeasible under the current constraints of CPI production. For these reasons, the use of model fixed effects has been employed[8]. The above specification was found to provide adjusted R-squares that tended to range within the low .90s (mostly within .90 to .94) for some classes, and the high .90s (mostly within .95 to .98) for others[9].

Separate regressions are run for each CPI geography and class of vehicle. The change in time dummy coefficient from $T-1$ to T of a window measures price change from the previous to current period, i.e. the measure of price change in a CPI stratum for a class of vehicles from $T-1$ to T will be given by $e^{\Delta\hat{\delta}_T^{class,w,...}}$, where $\hat{\delta}_t^{class,w,...}$ is the estimated time dummy coefficient for period t, and Δ is a difference operator.

Further details on the derivation of a monthly price relative from the hedonic time dummy model are given below, first by discussing the weighting within the regression model, then by constructing the relative from the estimated regression coefficients.

The regression model is estimated using the weighted least squares method, where the weight of observation i at time t is constructed as follows:

- take the observed sample expenditure on a model in each period, so $e_{i,t}^m = TC_{i,t}^m \cdot p_{i,t}^m$
  - $TC_{i,t}^m$ is the sample transaction count of i during t
  - $p_{i,t}^m$ is the price of i during t
- split the model's total observed expenditure in the window equally across periods[10] in window, so

$$\overline{e}_{i,w}^{m,cm} = \frac{\sum_{t=0}^{T} e_{i,t}^m}{n(m)}$$

  - $n(m)$ is the number of months in the window that the vehicle model was observed
  - a model m exists solely within a given class-make cm
- take observation i's share of the expenditures on the class-make during t (i.e. in each period of the window, a class-make's expenditures are distributed based on the window's sampled expenditures of models), so

$$s_{i,t,w}^{m,cm,...} = \frac{\overline{e}_{i,w}^{m,cm}}{\sum_{i \in S_{t,cm}} \overline{e}_{i,w}^{m,cm}}$$

  - $S_{t,cm}$ is the sample set of vehicles in class-make cm corresponding to period t
- the expenditure associated with observation i during t is then the share of class-make expenditures times the class-make's previous window price updated expenditures, so $e_{i,t,w}^{m,cm,...} = PPV_{T-1,used}^{cm,...} \cdot s_{i,t,w}^{m,cm,...}$
  - $PPV_{T-1,used}^{cm,...}$ is the previous period price updated expenditures on the used vehicle class-make cm

7. See Krsinich (2014). There are some minor differences such as the above model being run by class and geography (which is only relevant from having weights constructed separately by geography), as well as having regression weights included. Whereas New Zealand includes geography and engine size controls, as well as a squared age term.
8. Requena-Silvente and Walker (2006) found that even when modelling new vehicle prices using near fully specified regression models, it was still insufficient to capture the effect of unobserved characteristics, and thus caused bias in the time dummy indices produced. This research is further supported and built on by Varela-Irimia (2014).
9. This is either within, or above the range found in the research cited in other footnotes. Additional reading on the topic of modelling car prices – ranging from published literature, to room documents at international conferences discussing price change measurement – to produce hedonic indices can be found in Bode and van Dalen (2001), Nielsen (2018), Larsen (2011), Akay et al (2018), Cheng (2015), Tomat (2002), or Reis and Silva (2002).
10. This is done since only a sample of used vehicles sold in each period is available. The data source is focused mainly on new motor vehicle dealers, so covers a smaller portion of used vehicle sales. The sample transaction count can thus be volatile and splitting up sample expenditures as such is used to prevent sampling noise from affecting the weights a vehicle model has within the make's expenditure shares.

- the weight used in the regression model is then that expenditure as a share of the period's expenditures, divided by the number of periods in the window, so

$$wgt_{i,w,t}^{class,...} = \frac{e_{i,t,w}^{m,cm,...}}{(T+1)\cdot\Sigma_{i\in S_{t,class}} e_{i,t,w}^{m,cm,...}}$$

In summary, regression model weights have been constructed such that:

- for each period that it is observed in the window, a given used vehicle model had a constant absolute expenditure
- in each period, a class-make had the same absolute expenditure it did in any other period of the window in which it had a sale recorded in the sample
- the class-make share may vary by period, but only proportionally, as they only change if a class-make had no observations in that period of the window
- each period has an equal share of the weight in the regression model, i.e. $wgt_{w,t}^{class,...} \equiv \sum_i wgt_{i,t,w}^{class,...} = \sum_i wgt_{i,T,w}^{class,...}$ for all t

The following discusses the construction of the monthly price relative from the regression model. The approach is similar to the time-product dummy index discussed by de Haan and Hendriks (2013) and de Haan and Krsinich (2018).

For observation i, its imputed price for period t under the regression model would be:

$$\hat{p}_{i,t}^{class,w,...} = E(p_{i,t}^{class,w,...}) = e^{\hat{\delta}_t^{class,w,...} + \hat{\beta}_0^{class,w,...} + \hat{\beta}_1^{class,w,...} lnOdometer_i + \hat{\beta}_2^{class,w,...} lnAge_i + \Sigma_{m=1}^{M} \hat{\gamma}_m^{class,w,...} D_i^{model}}$$

A geometric mean of imputed prices from the weighted least square estimates for period t is then:

$$\prod_i \hat{p}_{i,t}^{\frac{wgt_{i,w,t}^{class,...}}{\Sigma_i wgt_{i,w,t}^{class,...}}}$$

$$= e^{\hat{\delta}_t^{class,w,...} + \hat{\beta}_0^{class,w,...} + \hat{\beta}_1^{class,w,...} \frac{\Sigma_i wgt_{i,t,w}^{class,...} \cdot lnOdometer_{i,t}}{\Sigma_i wgt_{i,w,t}^{class,...}} + \hat{\beta}_2^{class,w,...} \frac{\Sigma_i wgt_{i,w,t}^{class,...} \cdot lnAge_{i,t}}{\Sigma_i wgt_{i,w,t}^{class,...}} + \Sigma_{m=1}^{M} \hat{\gamma}_m^{class,w,...} \frac{\Sigma_i wgt_{i,w,t}^{class,...} \cdot D_{i,t}^{model}}{\Sigma_i wgt_{i,w,t}^{class,...}}}$$

i.e.

$$\prod_i \hat{p}_{i,t}^{class,w,...\frac{wgt_{i,w,t}^{class,...}}{\Sigma_i wgt_{i,w,t}^{class,...}}} = e^{\hat{\delta}_t^{class,w,...} + \hat{\beta}_0^{class,w,...} + \hat{\beta}_1^{class,w,...} \overline{lnOdometer}_t + \hat{\beta}_2^{class,w,...} \overline{lnAge}_t + \Sigma_{m=1}^{M} \hat{\gamma}_m^{class,w,...} \bar{D}_t^{model}}$$

Where $\overline{lnOdometer}_t$ is the sample mean of $lnOdometer$ in t, and the same is applied to other characteristics. If the ratio of geomeans from to T is taken, we obtain:

$$\frac{\prod_i \hat{p}_{i,T}^{class,w,...\frac{wgt_{i,w,T}^{class,...}}{wgt_w^{class,...}}}}{\prod_i \hat{p}_{i,t}^{class,w,...\frac{wgt_{i,w,t}^{class,...}}{wgt_w^{class,...}}}} = e^{\Delta^t \hat{\delta}_T^{class,w,...} + \hat{\beta}_1^{class,w,...} \Delta^t \overline{lnOdometer}_T + \hat{\beta}_2^{class,w,...} \Delta^t \overline{lnAge}_T + \Sigma_{m=1}^{M} \hat{\gamma}_m^{class,w,...} \Delta^t \bar{D}_T^{model}}$$

Where $\Delta^t x_T$ is a difference operator in x from t to T.

Rearrange to get (note the swapping of subscripts on changes in sample means):

$$\frac{\prod_i \hat{p}_{i,T}^{\frac{wgt_{i,w,T}^{class,...}}{wgt_w^{class,...}}}}{\prod_i \hat{p}_{i,t}^{\frac{wgt_{i,w,t}^{class,...}}{wgt_w^{class,...}}}} \cdot e^{\hat{\beta}_1^{class,w,...}\Delta^T \overline{lnOdometer}_t + \hat{\beta}_2^{class,w,...}\Delta^T \overline{lnAge}_t + \Sigma_{m=1}^{M}\hat{\gamma}_m^{class,w,...}\Delta^T \overline{D}_t^{model}} = e^{\Delta^t \hat{\delta}_T^{class,w,...}}$$

Since the weight of an observation is zero if it didn't exist in a given period, $\prod_i \hat{p}_{i,t}^{\frac{wgt_{i,w,t}^{class,...}}{wgt_w^{class,...}}} = \prod_{i\in S_t} \hat{p}_{i\in S_t,t}^{\frac{wgt_{i\in S_t,w,t}^{class,...}}{wgt_w^{class,...}}}$. Since the time dummies cause WLS residuals to sum to zero in each period of the regression window, $\prod_i \hat{p}_{i,t}^{\frac{wgt_{i,w,t}^{class,...}}{wgt_w^{class,...}}} = \prod_i p_{i,t}^{\frac{wgt_{i,w,t}^{class,...}}{wgt_w^{class,...}}}$. This makes the final equation equivalent to

$$\frac{\prod_i p_{i,T}^{\frac{wgt_{i,w,t}^{class,...}}{wgt_w^{class,...}}}}{\prod_i p_{i,t}^{\frac{wgt_{i,w,T}^{class,...}}{wgt_w^{class,...}}}} \cdot e^{\hat{\beta}_1^{class,w,...}\Delta^T \overline{lnOdometer}_t + \hat{\beta}_2^{class,w,...}\Delta^T \overline{lnAge}_t + \Sigma_{m=1}^{M}\hat{\gamma}_m^{class,w,...}\Delta^T \overline{D}_t^{model}} = e^{\Delta^t \hat{\delta}_T^{class,w,...}}$$

This is an interpretation of the hedonic time dummy model which lets us think of the change in time dummy coefficients as some measure of change in average prices that is quality-adjusted to reflect changes in the sample means of vehicles characteristics[11]. Since we are estimating price change from $T-1$ to T, the price relative is defined as $e^{\Delta\hat{\delta}_T^{class,w,...}}$.

Aggregation of monthly price relatives

The monthly price relatives constructed for each class are used alongside the class-make expenditures to roll-up up to an aggregate used vehicle price movement, and then to an overall purchase of used passenger vehicles price movement by price-updating and summing expenditures.

The class-make price relatives come from the time dummy coefficients, i.e.,

$$\frac{p_t}{p_{t-1}}^{class,make,...} = e^{\Delta\delta_t^{class,...}} = \frac{p_t}{p_{t-1}}^{class,...}$$

, and they are used to price update a class-make expenditure, i.e.,

$$PPV_{t,used}^{class,make,...} = \frac{p_t}{p_{t-1}}^{class,...} \cdot PPV_{t-1,used}^{class,make,...}$$

where $PPV_{t,used}^{class,make,...}$ refers to the used motor vehicle expenditures for a given class and make in period t.

Overall price-updated used vehicles expenditures are the sum across class-makes, so $PPV_{t,used}^{...} = \Sigma_{class}\Sigma_{make}PPV_{t,used}^{class,make,...}$. The overall used vehicles price movement is then just the sum of current period price-updated class-make expenditures over the previous period's corresponding sum, i.e.,

$$\frac{p_t}{p_{t-1}}^{used,...} = \frac{PPV_{t,used}^{...}}{PPV_{t-1,used}^{...}}$$

11. Alternatively, de Haan and Krsinich (2018) describe the weighted time dummy index as "the ratio of expenditure-share weighted geometric means of quality-adjusted prices" which is a quality-adjusted price index which is "transitive, hence drift free, and where items are weighted according to their economic importance".

Areas for future improvement

Statistics Canada is committed to data accuracy, quality and timeliness in measuring price change and producing a CPI that reflects the experience of Canadians. Statistics Canada is aware of some limitations of the above approach, mainly related to the granularity of the available data. Each of these limitations is caused by constraints in access to detailed data. However, Statistics Canada is actively working to address these limitations:

- Statistics Canada is in the process of acquiring more granular data on transacted vehicles in order to account for additional characteristics and effects such as vehicle trims in the quality adjustment process.
- Currently, there is a one month lag in the price data. Statistics Canada is working to improve the timeliness of data access and processing, in order to produce the most current estimates of monthly price change.

Data

Using the methods outlined above, price movements have been derived for used vehicles (Table 1). Table 1 contains the decomposed price movements for new and used passenger vehicles, as well as a derived purchase of passenger vehicles index based on the proposed approach.

Table 1
New and used passenger vehicles, 12-month change, Canada

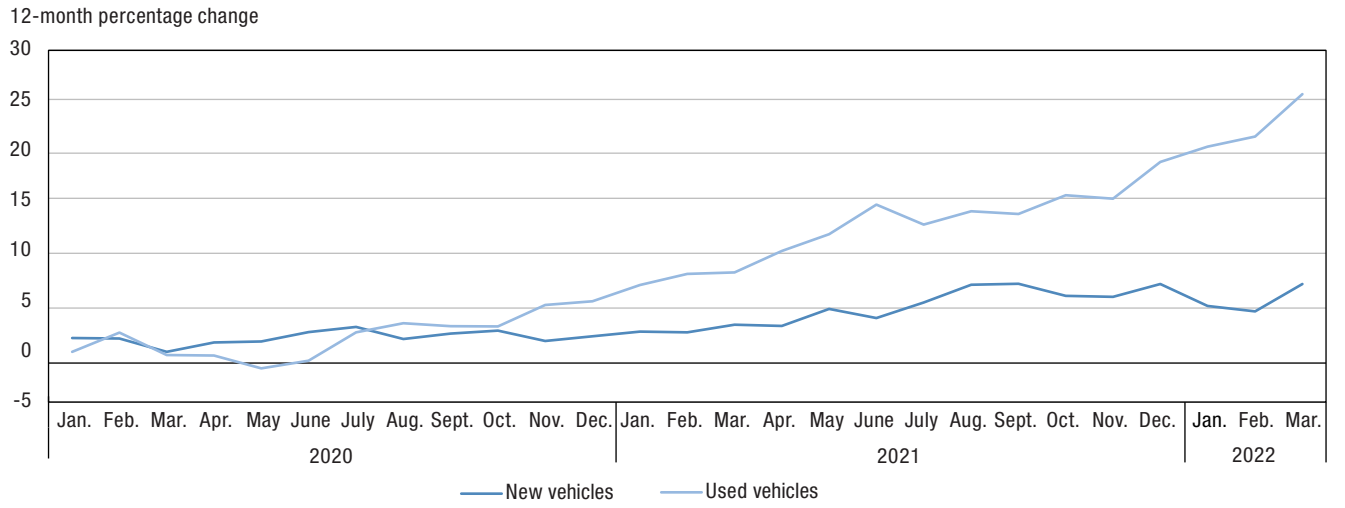
Reference Month	Purchase of new passenger vehicles (equivalent to the published purchase of passenger vehicles index)	Purchase of used passenger vehicles (calculated using proposed approach)	Purchase of passenger vehicles[1] (calculated using proposed approach, if introduced to the CPI in June 2021)
	percent		
December 2021	+7.2	+18.3	+11.2
January 2022	+5.2	+19.7	+9.2
February 2022	+4.7	+20.6	+8.8
March 2022	+7.0	+24.5	+11.7

1. The purchase of passenger vehicles index is derived outside the official system for CPI calculation. With the introduction of the 2021 CPI basket, the used vehicles index will be incorporated as an elementary product class with updated weights based on Household Final Consumption Expenditures data. Therefore, this series is not directly comparable to future published values.
Source: Consumer Prices program.

Used vs. new vehicles

Internal analysis indicates that price change for used vehicles has, until recently, tracked new vehicle price change to the extent that new vehicles served as a suitable long term proxy. Prices of used vehicles began to diverge from those of new vehicles in the fall of 2020 amid the COVID-19 pandemic.

Chart 1
New and used vehicles, Canada, January 2020 to March 2022[1]



1. The purchase of passenger vehicles index is derived outside the official system for CPI calculation. With the introduction of the 2021 CPI basket, the used vehicles index will be incorporated as an elementary product class with updated weights based on Household Final Consumption Expenditures data. Therefore, this series is not directly comparable to future published values
Source: Consumer Prices program.

The introduction of used vehicle prices with the 2021 CPI basket will secure against future divergences in trend from new vehicle prices.

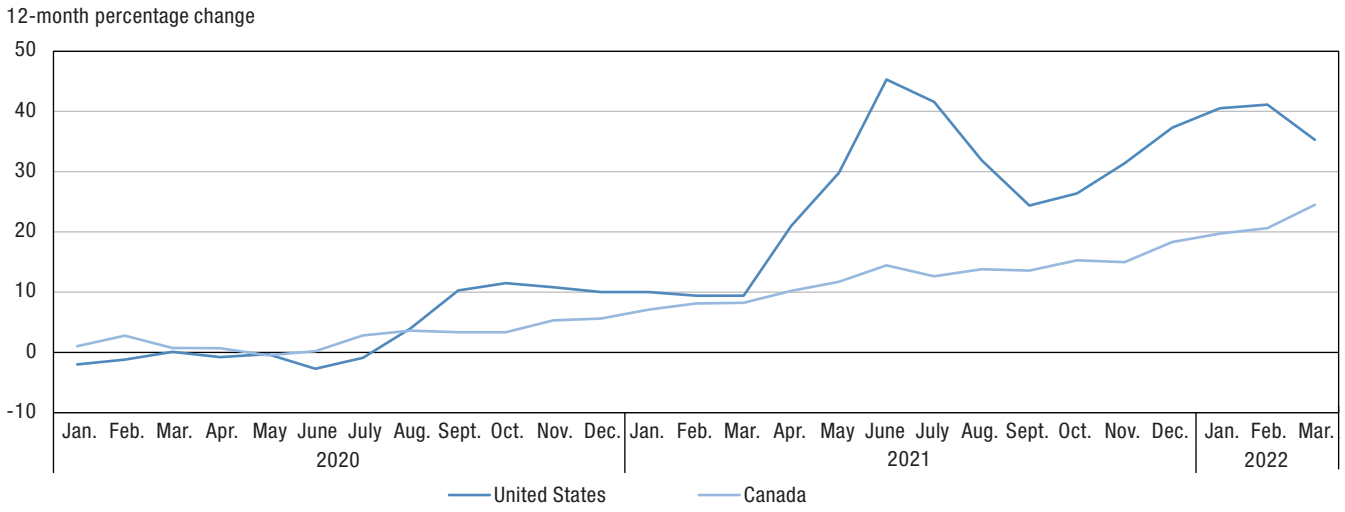
Comparison of used vehicle prices in Canada and the United States

While similar trends in the passenger vehicle market, where growth in used vehicle prices is currently outpacing growth in new vehicle prices, have been observed in both countries, Canadian consumers have not seen price increases of the magnitude of those observed in the United States.

There are key market differences between the two countries. Given the different sizes and scopes of automobile manufacturing in Canada and the United States, price movements may vary between the two countries for individual models. Not all used vehicles have shown the same price movements in the past year, with some classes of vehicle increasing in price significantly more than others. Sample composition, which is, in turn, influenced by what class of vehicles consumers are buying in Canada compared with the United States, may be contributing to the divergence in prices between the two countries. There is further potential for sample composition effects at the lowest level of detail because of differences in terms of available models in each country.

While both Statistics Canada and the Bureau of Labor Statistics (BLS) use a net household expenditures approach to calculating used vehicle weights, the weights are markedly different in the two countries. Passenger vehicles comprise 9.29% of the United States CPI basket of goods and services, compared with 6.21% in Canada. Of that weight, used vehicles make up 4.14% of the basket in the United States, compared with 1.84% in Canada's 2020 CPI basket. These differences may also contribute to a different pre-pandemic seasonal pattern in Canada compared with the United States.

Chart 2
Used vehicles in Canada and the United States, 12-month price change, January 2020 to March 2022



Source: U.S. Bureau of Labor Statistics and Statistics Canada.

Recent market conditions are likely also at play. Between Canada and the United States, there have been significant differences in the scope and duration of public health measures introduced to limit the spread of COVID-19, as well as the economic supports offered. While periodic stimulus cheques were sent to Americans, the Canadian government provided more consistent, targeted supports to those who had lost employment as a result of the pandemic. Notably, the biggest spike in used vehicles prices in the United States occurred between April and June 2021, which coincided with the third stimulus payment, tax refund season[12] and an end to public health measures in many jurisdictions. An equivalent movement was not observed in Canada, which remained under some form of lockdown in much of the country until July 2021. Lockdown policies themselves may have also played a role in shifting demand: as prices for used vehicles surged in the United States during the spring of 2021, Canadians, who were re-entering lockdown measures in several provinces, reduced their mobility rates to a greater extent than their American counterparts.[13]

There are also two differences in the methodological approaches used by the two countries:

- Statistics Canada uses a hedonic model, while the United States BLS[14] uses option cost adjustment based on information from car dealerships for quality adjustment;
- Different price data sources are used, with Statistics Canada using transaction data from point of sale and the BLS using assessment valuation data from an industry guide.

Impact on headline CPI

An analytical series was calculated to assess the impact of introducing used vehicle prices on the headline CPI. Given the weight of used vehicles (1.84%) in the 2020 CPI basket, if used vehicle prices had been introduced with the June 2021 CPI, coinciding with the last basket update, the headline CPI for March 2022 is estimated to have been 0.2 percentage points higher, compared with the published CPI (+6.7%).

12. Internal Revenue Service (IRS) data reveals that the average American received a $2,879 tax refund in 2021, a 10% increase from 2020. The average American therefore received nearly $4,000 in disposable income in spring 2021, which may have contributed to higher demand for used vehicles in the United States.
13. According to mobility data from the University of Washington, Americans reduced their total mobility by 14% on April 1, 2021, the beginning of the most significant spike in used vehicle prices. Canadians had reduced mobility by 33% on the same date.
14. Additional detail on the used vehicle model used by the United States Bureau of Labor Statistics can be found at Measuring Price Change in the CPI: Used Cars and Trucks.

2021 CPI basket

The introduction of the 2021 CPI basket will mark the implementation of the above enhancements to the calculation of the purchase of passenger vehicles index and the introduction of used vehicle prices to the CPI. At this time, the used vehicles index will be added to the CPI classification as a published aggregate:

Transportation

Private transportation

Purchase, leasing and rental of passenger vehicles

Purchase and leasing of passenger vehicles

Purchase of passenger vehicles

Purchase of automobiles (2013=100)[15]

Purchase of trucks, vans and sport utility vehicles (2013=100)[15]

Purchase of new passenger vehicles (2022-04=100)[16]

Purchase of used passenger vehicles (2022-04=100)[16]

Because the CPI is a non-revisable index, used vehicle prices are proposed to be introduced with the May 2022 monthly price change with no level adjustment for historical price changes. This approach is consistent with the way other products have been included in the CPI such as cellular services, electronic devices and cannabis. This approach follows international best practices as well as the Consumer Price Index Manual (Chapter 7) and recommendations by Statistics Canada's Price Measurement Advisory Committee. Although this type of 'catch-up' adjustment would account more fully for the impact of the recent increases in Canadian used vehicle prices in the CPI, it would be problematic for indexation and escalation of contracts that took effect in the past.

In summary

As of the introduction of the 2021 CPI basket, a new approach for measuring price change in used vehicles is recommended to replace the previous method of measuring used vehicles price change by proxy.

Statistics Canada continues to work with price experts, national statistical organizations and other partners to ensure data and methods used in the calculation of the CPI are aligned with international standards and best practices. The agency is continuing to monitor prices for used vehicles and acquiring new data sources for the measurement of the purchase of passenger vehicles index ensures the ongoing accuracy and relevance of the CPI.

For additional information or to provide comments on the proposed enhancement, users may contact the Consumer Prices Division at statcan.cpddisseminationunit-dpcunitedediffusion.statcan@canada.ca.

15. Given the integration of new and used passenger vehicles as published series, the *aggregates purchase of automobiles (2013=100)* and *purchase of trucks, vans and sport utility vehicles (2013=100)*, first published in 2018, will no longer be published.
16. With the introduction of the 2021 CPI basket, two new series will be published, *purchase of new passenger vehicles (2022-04=100)* and *purchase of used passenger vehicles (2022-04=100). Both index price series will be available starting April 2022 and will be published at the national level.*

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