

# Price Trends in Nunavik 2011-2016 – Consolidating Sets of Comparative Price Data

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## 1. INTRODUCTION

In the absence of official figures measuring consumer prices in Nunavik, the Nunivaat program has conducted several comparative price studies in the region. These studies were designed to meet the needs for specific data, and the methods employed varied according to their objectives. Using the most recent sets of comparative data on prices in Nunavik, the present study aims to produce a time series of comparable indices by means of a harmonized methodology.

## 2. DATA SOURCES

Two sets of data were used for this project: those in the report *Consumer Prices Monitoring in Nunavik 2011-2013* and those in *The Cost of Living Survey in Nunavik 2016*. The 2011-2013 consumer prices monitoring study was conducted to track price changes during the transition period from the Food Mail program to the Nutrition North Canada program.<sup>[2]</sup> To that end, six collections of price data were carried out in Nunavik and the city of Québec in order to measure changes in the cost of a predetermined basket of everyday consumer products. The product list was comprised mainly of food products, but also included household cleaning products and personal care products. The comparative indices that were calculated used the prices taken in Québec in April 2011 as the reference value.

The 2016 cost of living survey was designed to measure the cost of living in Nunavik by taking into account the consumption patterns of households in the region.<sup>[3]</sup> To do this, participating households in Nunavik recorded in a journal of expenses all their purchases and cash receipts for two weeks. The cost of these same goods and services was then measured in the city of Québec. Weighted indices of household expenditures were calculated for each category of goods and services, i.e., the value of goods and services that households consumed in greater quantity had a greater influence on the indices than other items that were consumed less.

## 3. HARMONIZATION OF THE DATA

While the 2011-2013 price monitoring dataset covers a fixed basket of products, the dataset of the cost of living

survey contains price data on a wider range of goods and services. It also includes other types of data, for example the quantities consumed by participating households. In order to obtain a subset of price data that are comparable, the following operations were carried out. Starting from the list of products used in the 2011-2013 price monitoring study, a subset of identical products or products with similar properties was selected from the 2016 cost of living dataset. Only the entries for which price comparisons between Nunavik and Québec were available within the same year were retained, so as to be able to calculate indices for which the reference year is the current year. When there was more than one observation per community for the same product, the geometric mean of the prices was used, in order to obtain a single price observation per community for a given product for each period.

The comparative price indices require observations for all the products in the basket for all the communities selected for the entire period under study because the omission of an observation modifies the implicit weights associated with the other products.<sup>[4]</sup> In order to reduce the distortions that missing price data can introduce, the following rules of imputation were applied. Regarding the data for the period 2011-2013, when the value of a product was missing in a community, the last known value was imputed; and when a value was missing between two known observations, linear interpolation was used to impute the value. For observations that could not be imputed in this way, the observed value for the nearest village was used.

Since the data for the 2016 period included one more village than the other periods, the data from Tasiujaq were used to impute the data from the other villages, but all observations from this village were not retained for the calculation of the indices. Thus, the indices for the 2011-2013 period are based on observations from Kuujuaq, Kuujuarapik, Quaqtaq, Salluit and Umiujaq; and for the 2016 period, Kangiqsualujuaq, Kuujuaq, Puvirnituq, Salluit and Umiujaq.

## 4. CALCULATION OF THE INDICES

Indices were calculated for the basket as a whole and for each of the three main product categories studied, namely food, household cleaning products and personal

care products. Two series of indices were calculated: the first, in which each of the prices for a given period in Nunavik was compared with their value in Québec; and a second which traces price changes in Nunavik and Québec from 2011 to 2016, with the reference value being the prices measured in 2011.

We employed the Jevons elementary index formula, or, to be more precise, the ratio multiplied by 100 of the geometric mean of the prices observed for the current period over the geometric mean of the prices of the reference period or region. One advantage of this formula is that it produces indices that are less influenced by extreme prices.<sup>[5;6]</sup> This is an elementary index, i.e., these indices are not weighted by household consumption patterns or other factors. Confidence intervals were calculated by bootstrap resampling to estimate their margin of error.

## 5. LIMITATIONS

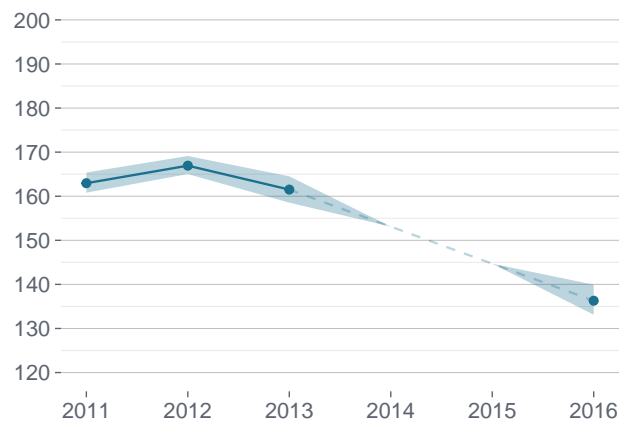
Although every precaution was taken to limit these effects, the differences in methodology between the two surveys could introduce biases. In particular, the 2016 survey was not designed to track a specific basket of products over time, resulting in missing data. Also, the data universes are not perfectly identical, both for the villages under study and the businesses selected for comparison in the city of Québec. The imputation methods used may also introduce bias, the data not being sufficiently detailed to allow for the application of the most accurate imputation methods. It should also be noted that no data for the years 2014 and 2015 are available; the estimated trend for these years is represented by a dotted line in the figures below. Lastly, these indices are calculated on the basis of a limited sample of consumption in Nunavik. They are indicators of price levels based on an arbitrary consumption basket and do not therefore summarize the general level of prices or the cost of living.

## 6. CHANGES IN THE PRICE GAP BETWEEN NUNAVIK AND QUÉBEC

For all the categories of products measured with the exception of personal care products, there appears to have been a slight increase in the price gap between Nunavik and the city of Québec between 2011 and 2012 (Figure 1). Then, starting in 2013, that price gap between Nunavik and Québec decreased for all the products under consideration. More specifically, the price difference between 2013 and 2016 is 24 points for the entire basket: 23 points for food, 25 points for household cleaning products and 28 points for personal care products (Figure 1-4).

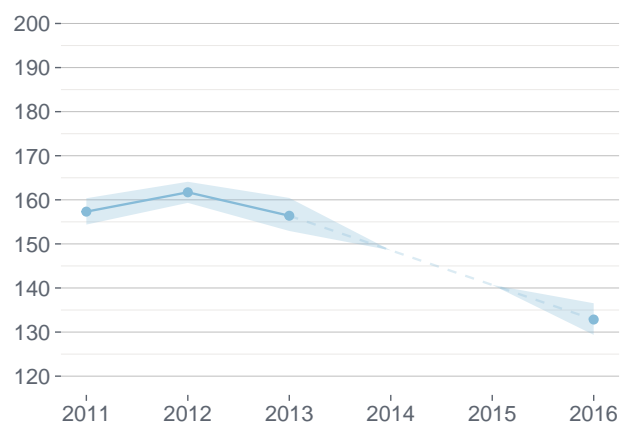
**Figure 1**

Price index, entire basket, Nunavik, 2011-2013, 2016  
(Québec = 100)<sup>[7]</sup>



**Figure 2**

Price index, food products, Nunavik, 2011-2013, 2016  
(Québec = 100)

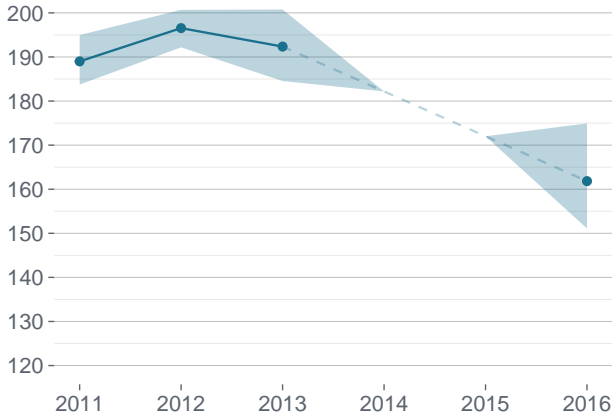


## 7. CHANGES IN THE PRICE OF THE BASKET OF PRODUCTS

The value of the basket of goods under study changed differently in Québec and Nunavik between 2011 and 2016. In Québec, the prices of food and non-food products moved in opposite directions: food prices decreased slightly in 2012 and then gradually increased starting in 2013, while the price of non-food products increased in 2013 and then slightly decreased in 2016 (Figure 5-8). In Nunavik, on the other hand, the value of the basket of products fluctuated very little from 2011 to 2013, with

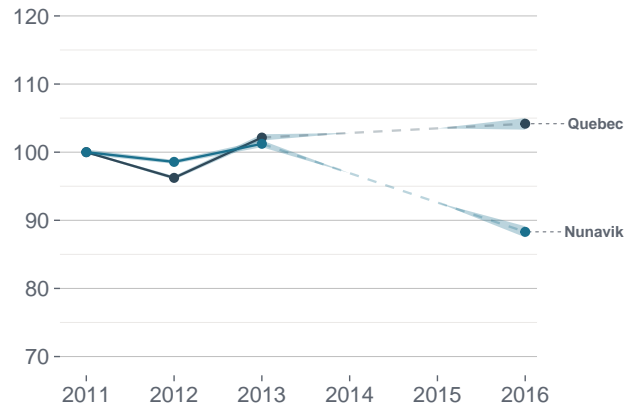
**Figure 3**

Price index, household products, Nunavik, 2011-2013, 2016 (Quebec = 100)



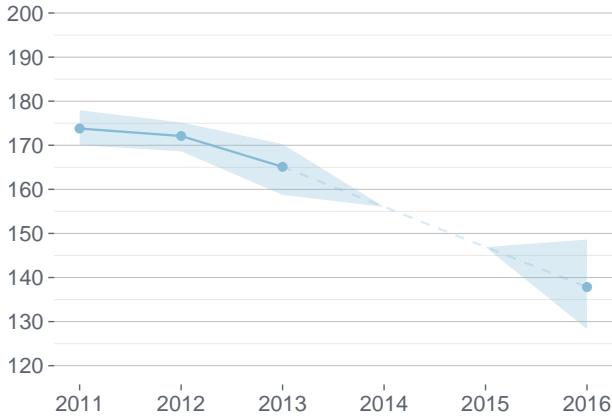
**Figure 5**

Price index, entire basket, Nunavik and Quebec, 2011-2013, 2016 (2011 = 100)



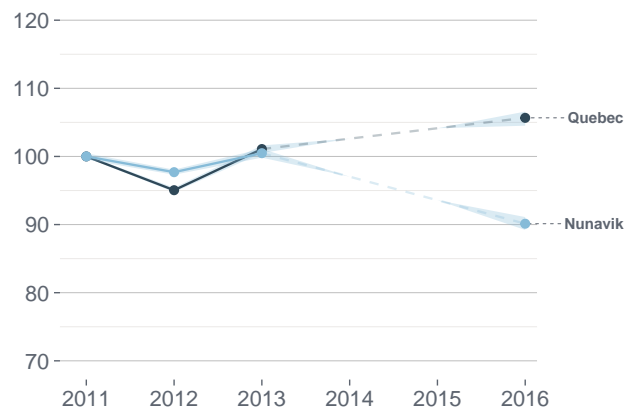
**Figure 4**

Price index, personal care products, Nunavik, 2011-2013, 2016 (Quebec = 100)



**Figure 6**

Price index, food products, Nunavik and Quebec, 2011-2013, 2016 (2011 = 100)



the exception of the price of household cleaning products, which increased slightly during this period. Between 2013 and 2016, however, the price levels of all types of products decreased.

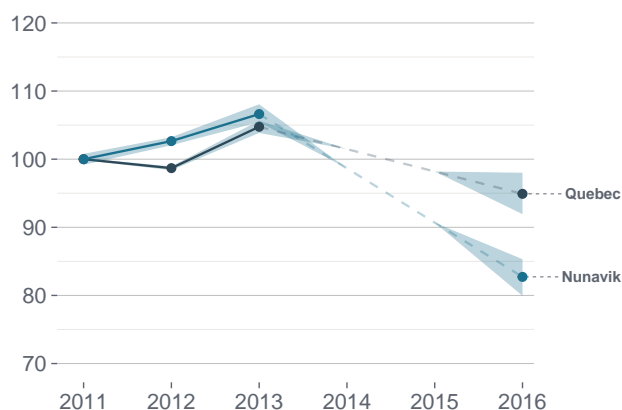
## 8. DISCUSSION

Assuming that the observed trend is not attributable to the limitations described above, several factors could help to explain the changes in the price gap between Nunavik and Québec, including the modifications made to the principal consumer price subsidy programs in the

region. Although it is difficult to relate the two time series, the differences in the trajectories of the price levels in Nunavik and Québec suggest that the changes in Nunavik are not just attributable to price trends in Québec. In particular, while the price of food tended to increase in Québec beginning in 2013, it decreased in Nunavik during the same period. The transition from the Food Mail program to Nutrition North Canada that occurred between 2011 and 2012 could help explain the small price increase observed during this period, since the Nutrition North Canada program subsidized fewer products than its

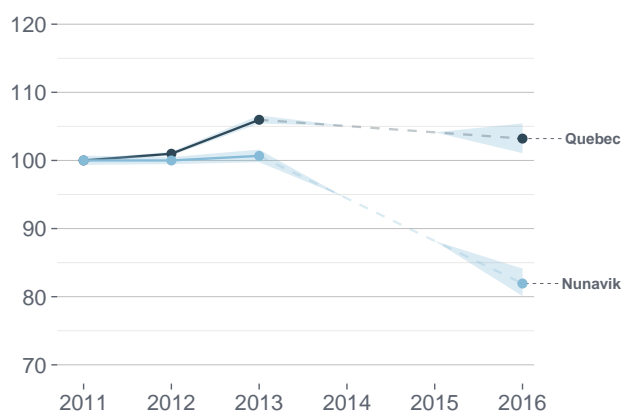
**Figure 7**

Price index, household products, Nunavik and Quebec, 2011-2013, 2016 (2011 = 100)



**Figure 8**

Price index, personal care products, Nunavik, 2011-2013, 2016 (2011 = 100)



predecessor.<sup>[8]</sup>

After 2013, changes to Nutrition North Canada may have contributed to the decrease in the price of certain food products, especially with the improvements made to this program following the recommendations of the Auditor General (Office of the Auditor General of Canada, 2014) and the increase in its budget beginning in 2014-2015.<sup>[9]</sup> The decrease in food prices, as well as in household cleaning and personal care products, may also reflect the implementation of various measures introduced by the Kativik Regional Government to reduce the cost of

living. Between 2013 and 2016, the total budget for these measures more than doubled, going from \$4,723,945<sup>[10]</sup> to \$11,784,129<sup>[11]</sup> The Food and Other Essentials program, which is applied at the cash register and subsidizes a selection of products at a set percentage in all Nunavik grocery stores, covers in fact most of the products of the basket used in this study.

## NOTES AND REFERENCES

- [1] Nunivaat analyst, research professional, Canada Research Chair on Comparative Aboriginal Condition, and corresponding author. Email: sebastien.levesque.11@ulaval.ca.
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- [6] Statistics Canada. 2019. *The Canadian Consumer Price Index Reference Paper*. Statistics Canada, Ottawa.
- [7] The confidence intervals are represented by a colored band around the data points. In the absence of observations for 2014 and 2015, the values for these years were estimated by linear interpolation and are represented by a dotted line in an effort to characterize the trend between the known values. These trends should be interpreted with caution.
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