Using household expenditures in the Canadian Consumer Price Index (CPI) Compilation: Democratic versus Plutocratic weights. Michel Sekimonyo, Statistics Canada

**Background**
- The Canadian CPI measures price change over time for a basket of consumer products of fixed quantity and quality.
- Household expenditure weights are used to compile an average price change for a multitude of products, meaningful to households and other economic agents.
- Other factors relevant to the CPI: product coverage, quality adjustment methods, and timing of introduction of new products and outlets.

**Deriving basket weights**
- \( w_{h,i}^b = \frac{P_{h,i}^b \times Q_{h,i}^b}{\sum_{j=1}^{N} P_{h,j}^b \times Q_{h,j}^b} \)
  - \( w_{h,i}^b \): expenditure share of product \( i \) for household \( h \) in the basket
  - \( P_{h,i}^b \times Q_{h,i}^b \): household \( h \)'s expenditure on commodity \( i \)
  - \( \sum_{j=1}^{N} P_{h,j}^b \times Q_{h,j}^b \): household \( h \)'s expenditure on all \( N \) products.

**Democratic approach**
- \( \sum_{i=1}^{N} w_{h,i}^b \times \frac{Q_{h,i}^b}{Q_{h,j}^b} \times \frac{\sum_{j=1}^{N} P_{h,j}^b}{\sum_{j=1}^{N} P_{h,j}^b} \)
  - The democratic approach is an average of the baskets of each household in the target population.
  - It gives equal weight to basket of each household in the population, when deriving household expenditure weights.

**Plutocratic formula**
- \( \sum_{i=1}^{N} w_{h,i}^b \times \frac{Q_{h,i}^b}{Q_{h,j}^b} \times \frac{\sum_{j=1}^{N} P_{h,j}^b}{\sum_{j=1}^{N} P_{h,j}^b} \)
  - The plutocratic approach looks at how much each dollar is allocated in the target population.

**Uses of the CPI**
The Canadian CPI serves as a tool for macro and micro-objectives:
- The CPI is used to escalate government transfer payments and payments from the Canada Pension Plan program.
- The Bank of Canada uses the CPI as a general indicator of domestic inflation for its inflation-targeting framework.
- The CPI is used as a deflator for various economic aggregates in the System of National Accounts.

**Data sources**
- Expenditure data 2011, 2013 and 2015
  Household expenditure data were obtained from the Survey of Household Spending (SHS), which provides information on expenditure by product, annual income and other dwelling characteristics.
- Price data
  Price relative data for January 2013 to December 2017 were extracted from Statistics Canada’s CPD internal files.

**Contribution**
- Statistics Canada uses a plutocratic formula to calculate expenditure weights used in the CPI compilation.
- The plutocratic approach is favored by national statistical agencies because it offers a balance between the multiple uses of the CPI and the practical elements of compiling a CPI.
- This research contributes to the understanding of the methods used in the compilation of the CPI.

**Uses of the CPI**
- The direction and, to some extent, the magnitude of the democratic gap are consistent across the provinces.
- In nine of the ten provinces, a larger democratic weight for rent was partly offset by a larger plutocratic weight for the mortgage interest cost, with the exception being Alberta.

**What have we learned?**
- Household expenditure weights, an important input into the CPI, permit for average aggregate price changes to be calculated.
- This study assessed the use of the democratic formula, and found a gap between the democratic and plutocratic basket weights.
- The choice of formula for calculating basket weights had little to no impact on the CPI.

**Additional notes**
- The results of this study should not be compared to the official Canadian CPI since the products that comprise the basket used for this study differ from those in the official CPI basket.
- In addition, the study employed a simplistic approach to linking the different SHS baskets used to compile the CPI.
- For further information contact: michel.sekimonyo@canada.ca

**12-month change in the Democratic and Plutocratic CPI, Canada, January 2014 to December 2017**
As it relates to the Canadian CPI:
- The impact of the different weights (Demo vs. Pluto) on the CPI is not consistent over time.
- As prices for products with a positive democratic-gap decline, a democratic CPI will tend to show a greater decline in overall price change than and a plutocratic indicator; the reverse can be said in regards to durable goods.
- The results presented in the chart reflect basket updated in 2015, using the 2013 SHS, and 2017, using the 2015 SHS.