Challenges of Using National Accounts for a More Frequent Update of the Brazilian CPI Weights

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83 anos do IBGE

Background

- The upper-level substitution bias in a fixed basket index is likely to increase with the age of the weights.
- Increasing the frequency of updating weights minimizes the distorting impact that changes in consumer preferences and item substitutions might have on the index.
- It is often recommended in CPI literature the basket updating of weights as frequently as possible – at least every 5 years – in order to ensure that they do not become unrepresentative and irrelevant.
- The Household Budget Surveys (HBS) is in general the primary data source for deriving weights.
- Updating of weights depends on how often a HBS is conducted. However, a program of annual surveys could be very costful.
- Various sources of data can complement each other by establishing more reliable and accurate general weights.
- One of the main sources recommended and used for this purpose is the System of National Accounts (NA).
- There are two main practical advantages in using NA data for estimating the weights:
  - ➢These data are disseminated annually on a calendar basis.
  - ➢The scope and coverage of Household Final Consumption Expenditure (HFCE), adjusted to cover all expenditure by households within the economic territory, is consistent with the scope and coverage of the Brazilian CPI (as defined by the domestic concept).

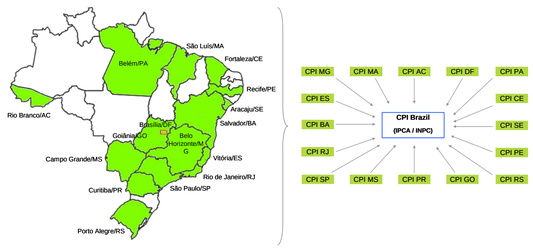
Motivation

- The HBS is the main data source for deriving expenditure shares for the goods and services covered by the official Brazilian CPIs produced by IBGE under the scope of the SNIPC.
- Hence, weights updates depends on how often the HBS is conducted, which unfortunately is taking place on a less frequent basis (more than seven-year intervals) because the survey costs and budgets constraints.
- In this sense, NA can be an alternative and complementary source for deriving CPI expenditure weights using the HFCE estimates.

Overview of the IBGE's CPI

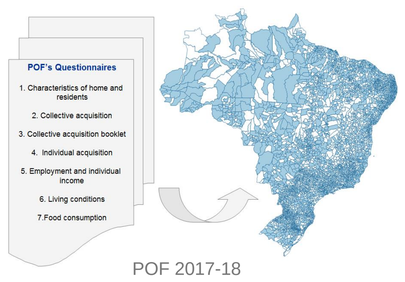
The bottom-up approach of the Brazilian CPIs within the SNIPC

Both the national IPCA and the national INPC are obtained by aggregating the regional indexes through a weighted arithmetic mean. The 16 areas have their own baskets of products and for each of them separate CPIs are calculated.



Deriving the weighting pattern: the Brazilian Household Budget Survey – POF

≈ 1,000 interviewers applied 7 questionnaires during 7 days in 75,000 households distributed in 1,900 municipalities.



POF 2017-18

Challenges of using National Accounts for weight updates

Non-integrated classification structures

Concordance mapping between HFCE and CPI ('translators')

Using more detailed data from NA (at the level in which the works of balance of supply and demand of products are carried out)

HFCE weights disaggregated for the 19 SNIPC subgroups

Differences in scope and definition of consumption between CPI and NA

Exclusion of some non-monetary expenditures of the HFCE

Imputed rentals (owner-occupied housing), Financial Intermediation Services Indirectly Measured (FISIM), and Not for Profit Institutions Serving Households (NPISH)

HFCE data conceptually aligned for CPI weighting purpose

Impact of revisions of National Accounts data on CPI weights

Use of HFCE definitive results obtained on a financial year basis

NA data for a given year *t* are revised several times (annual cyclical revisions) before they can be considered as final (that occurs only in year *t+2*)

Stability of the CPI weights series obtained via NA database

Producing annual weights for the individual metropolitan areas

Pro-rata approach: assumptions

- No relative change in the households expenditure proportions of a given metropolitan area with respect to the rest of the metropolitan areas surveyed
- For each metropolitan area, ratios by SNIPC aggregates are fixed along the period between HBSs

1 $w^{*}_{iBR} = w_{iBR} \times (HFCE^{t}_{i} / HFCE^{t-1}_{i})$

2 $w'_{ij} = w^{*}_{iBR} \times (w_{ij} / w_{iBR})$

3 $w^{*}_{ij} = w'_{ij} \times (100 / \sum^{n}_{i=1} w'_{ij})$

Where:

w_{iBR} = previous national weight for SNIPC aggregate i.

w^{*}_{iBR} = new national weight for SNIPC aggregate i adjusted using HFCE movements.

$HFCE^{t-1}_{i}$ = HFCE weight for the previous year for SNIPC aggregate i.

$HFCE^{t}_{i}$ = HFCE weight for the current year for SNIPC aggregate i.

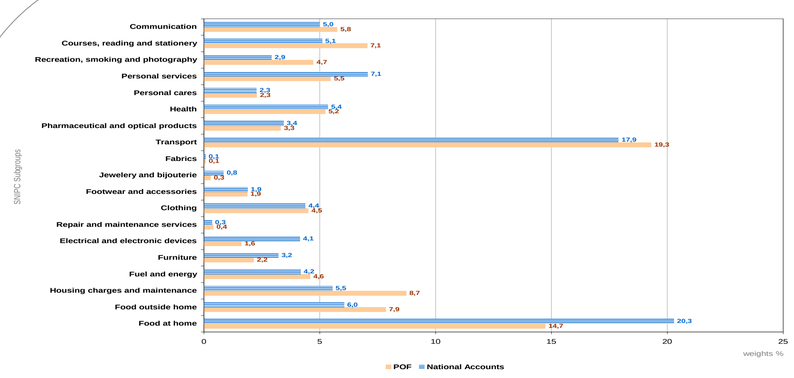
w_{ij} = previous regional weight for SNIPC aggregate i and metropolitan area j.

w'_{ij} = "intermediate" (previous to normalization step) regional weight for SNIPC aggregate i and metropolitan area j, before the normalization.

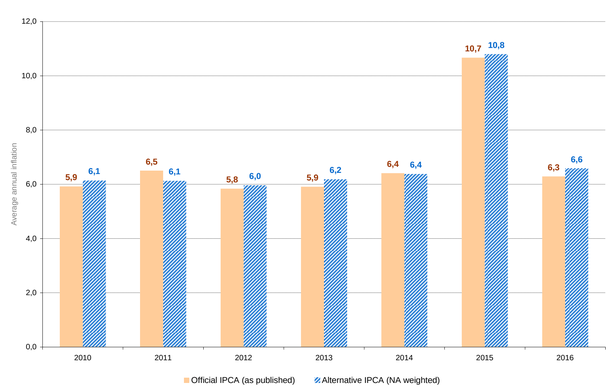
w^{*}_{ij} = new regional weight for SNIPC aggregate i and metropolitan area j.

CPI weights at the regional level (metropolitan areas) partially updated via HFCE data

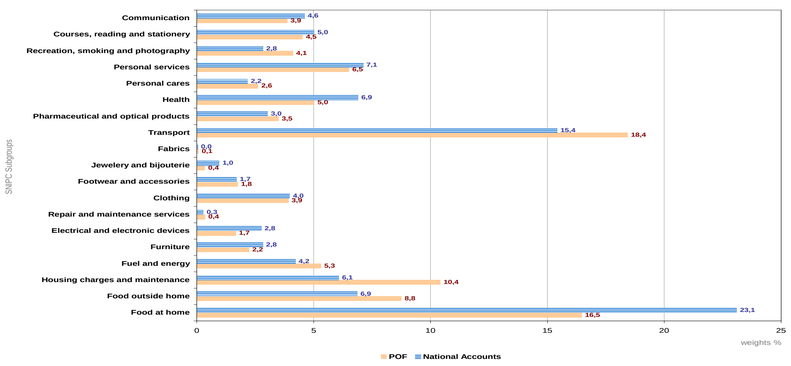
First empirical results



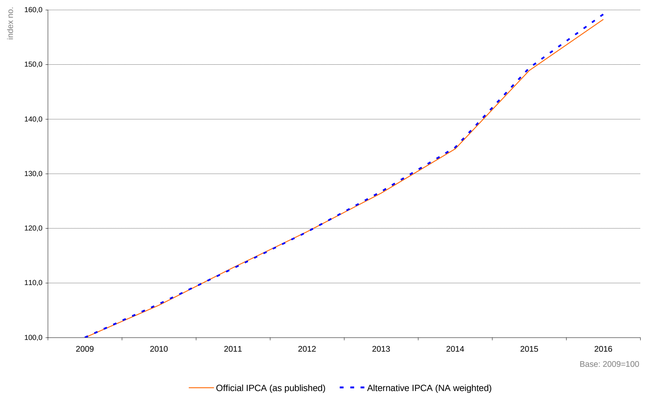
Average IPCA weight compared to the average weight calculated using National Accounts data as the primary expenditure source (%) - Brazil, 2010



Official IPCA (as published) compared to an alternative IPCA calculated using National Accounts data as the expenditure source for the weights - Brazil, 2010-2016



Average IPCA weight compared to the average weight calculated using National Accounts data as the primary expenditure source (%) - Brazil, 2016



Index comparison between official IPCA (as published) compared to an alternative IPCA calculated using National Accounts data as the expenditure source for the weights

Conclusions

- **The results show the Alternative IPCA (NA weighted) tracking closely to the Original IPCA (as published).**
  - Average annual inflation rate: 6,9% (Alternative IPCA) x 6,8% (Original IPCA)
  - Cumulative inflation rate: 59,2% (Alternative IPCA) x 58,3% (Original IPCA)
- **The upper bias of the index** – inherent to the calculation formula based on the measurement of a fixed basket over time – **was relatively counterbalanced by the impact that the variation of the prices of *Food at home* had on the general IPCA**.
  - The subgroup gained weight in the alternative structure and recorded average annual inflation higher than the average rate of the total economy.
- The international literature does not recommend replacing the HBS with the National Accounts. **The HBS at regular intervals (less than 5 years) remains a fundamental element for the general updating of weights**, especially in the more disaggregated classification levels for which there is no data availability via National Accounts.
- **In a scenario of budgetary constraint, the complementary use of new data sources (National Accounts, for example) would be an advantageous alternative to ensure the most frequent updating of the CPI weights** and, therefore, to ensure its credibility in the midst of an economy in constant transformation.
- This is a question of great importance, especially when considering the **economic and social costs caused by a bias in the price index**, caused by an obsolete basket of products and outdated weights.