



EUROPEAN COMMISSION
EUROSTAT

Directorate C: Macro-economic statistics
Unit C-4: Price statistics. Purchasing Power Parities. Housing statistics

HICP Compliance Monitoring Report

Luxembourg

March 2021

1. Introduction

In November 2020 Eurostat reviewed the compilation of the harmonised index of consumer prices (HICP) for Luxembourg. The review was done against the existing legal framework, established HICP recommendations and other guidelines and good practices in the field of consumer price indices (CPI).

The current report is based on:

- The 2020 inventory containing details of data sources, definitions and methods used in the HICP for Luxembourg.
- The discussion at the compliance monitoring visit, which was held via videoconference with Statec on 23 November 2020, and a subsequent clarification round done by email.
- The information note on the previous compliance monitoring exercise published in [October 2012](#).

For all main methodological topics related to the HICP, this report briefly summarises the Luxembourgish compilation practices followed by Eurostat's appraisal of compliance and, if applicable, recommendations for improvement. The report concludes with Eurostat's overall assessment of compliance of the HICP for Luxembourg.

2. Coverage and classification

The coverage of the HICP for Luxembourg follows the Household Final Monetary Consumption Expenditure (HFMCE), as defined in point 20 of Article 2 of Regulation 2016/792 (framework regulation) and the annex to Regulation 2020/1148 (implementing regulation).

Consistent with the definition in the framework regulation, the HICP includes only household monetary transactions carried out on the Luxembourgish territory. Consumption of own production, such as housing services consumed by owner-occupiers, income in kind and other non-monetary transactions are not taken into account for the national CPI and HICP. The expenditures incurred by all types of households are covered, regardless of their position in the income distribution or nationality.

Institutional households' expenditure is not explicitly taken into account but it is assumed to be implicitly covered in HFMCE figures as the result of a supply and use balancing procedure used for the derivation of HICP weights. In line with the domestic principle, the expenditure made by cross-border workers and other non-residents on the economic territory is implicitly estimated through comparisons of administrative and other data sources and the annual Household Budget Survey (HBS) on resident's household consumption expenditure. Expenditure made by resident households outside Luxembourg is excluded.

The Luxembourgish HICP is compiled and disseminated using the European classification of individual consumption by purpose (ECOICOP), which was adopted in 2016 in the framework regulation. An additional six-digit national classification level with 309 categories, which links to the lowest layer of the ECOICOP, is used to group products at the more granular levels of the index.

Compliance

The coverage of the HFMCE and the classification used for the Luxembourgish HICP are in line with the legal requirements.

Recommendation

- Statec should investigate the possibility to make explicit estimates of the expenditure of institutional households and of dwelling allowances, which are identified in the annex to the implementing regulation as part of HMFCE.

3. Sampling and representativity

Given the size of the country, no regional stratification is used in the design of the field price survey supporting the HICP for Luxembourg. Products are essentially selected based on information taken from the HBS, which is conducted yearly on a representative sample of 1,000 to 1,500 households. Around 7,700 products are covered, for which specifications with the product's main characteristics are first defined centrally.

Product specifications are defined more tightly by price collectors who select, at the end of each year, the variety to be followed in the next year in sampled outlets. Price collectors select and replace varieties based on the most-sold criterion and having in mind its likely continuity on the market. The identification of newly significant products, when not provided by the annual HBS, is provided by field staff, who also identify obsolete products.

Administrative files are also used for drawing the sample for some product categories. Examples are pharmaceutical products, for which a sample of 112 products is taken from information obtained from the Luxembourgish National Health Fund, new cars, where the sampling frame is provided by a database on car registrations, and passenger transport by air, where a total of 14 destinations, covering 66% of total number of passengers, is obtained from the country's airport operator. The figures provided by the operator do not include a split between private and business passengers. Destinations perceived as being used mainly for business purposes (e.g. Frankfurt and Paris), are not included in the sample of destinations covered by the index.

The sample of outlets is drawn centrally on a purposive basis with the collaboration of price collectors. Prices can be collected in any outlet type as the sample of outlets is drawn without a stratification based on outlet types. The sample considered in the monthly field price survey consists of around 680 outlets. For rents, approximately 1,000 dwellings are followed through the rents survey. This sample was drawn on the basis of the population register using simple random sampling extraction mechanism.

The monthly prices survey is essentially carried out in the largest urban centres of the country which cover, in addition to its capital (Luxembourg City), mainly other municipalities located in the south of the country (Esch-sur-Alzette canton). As of January 2018, scanner data are used in the production of price indices for non-seasonal food products and non-alcoholic beverages (around five percent of the HICP basket). The providers are also sending data covering other

product categories, but it is not currently being used. The data is provided by a sample of three retailers, which are estimated to represent 60% of the market.

Compliance

The sampling and representativity in the HICP for Luxembourg are in line with the legal requirements.

Recommendations

- Increase retailer and product coverage of scanner data, which is currently representing 60% of the market and food and non-alcoholic beverages.
- Investigate the possibility of obtaining, from the national airport operator or from the main airline companies operating from Luxembourg, data by destination providing a split between business and economy class passengers to be used in the selection of flights.

4. Weights

The compilation of weights is based on the derivation of household final consumption expenditure (HFCE) aggregates, which are calculated by Statec's National Accounts unit on an annual basis at the six-digit national ECOICOP classification level. These aggregates are calculated using a supply and use balancing procedure, which combines different type of sources, such as the HBS and administrative data sources (e.g. tobacco, petrol products).

The latter data sources are of particular relevance in estimating non-resident household consumption expenditure and in the balancing exercise of six-digit categories for some products (tobacco, petrol products) given the large degree of openness of the Luxembourgish economy and the number of cross-border workers.

The weights provided by national accountants, which are used in the compilation of price indices for year t , cover year $t-2$ consumption expenditure. These six-digit level weights are usually compiled in September of year $t-1$. Finally, the price updating to December of year $t-1$ and the normalisation (to 1,000) of weights is done by Statec's price statistics unit. When normalising the expenditures, Statec also takes out from HFCE figures the expenditures that are not in the scope of the HICP such as games of chance and imputed rents. All subclasses of the ECOICOP accounting for more than one part per thousand of the HFMCE are included in the HICP for Luxembourg.

The derivation of weights below the 6-digit (i.e., elementary aggregate) level is done using different weighting schemes. While for most of the 6-digit categories the weights are distributed equally to elementary aggregates, some explicit weights are also used when reliable information for year $t-2$ is available. For example, explicit weights are used for internet access provision services, whose elementary aggregate weights are derived from information taken from the national regulator in this area. For the aggregation of elementary aggregates for which scanner data and manually collected prices are used, annually updated retail turnover statistics from year $t-2$ provide two types of weighting schemes, the first one allowing to weight together the three retailers providing scanner data, and the second one allowing to combine the scanner data indices with indices based on information collected from the field survey.

Compliance

The compilation of weights in the HICP for Luxembourg is in line with the legal requirements.

5. Price collection

The monthly field price survey is conducted by seven price collectors who collect prices in the selected outlets. Electronic devices have been used for the price collection since March 2017. In addition to field price collection, information on prices is also collected from administrative data sources and through the provision of scanner data, which has been introduced in the regular production of the index from the release January 2018 figures.

Although there are plans for the use of web-scraped information in the compilation of price indices (electronic goods and airfares), this data source has not been incorporated in the HICP production system. Administrative files are used as a source for the compilation of the price indices for pharmaceutical products, domestic services by paid staff and child care services. The information on pharmaceutical products includes also the level of reimbursement received by households. In relation to domestic services and child care services, prices are respectively inserted in the index with a three and one months' delay in relation to the time in which the service was provided.

The prices of the field survey are collected between the 1st and the 21st of each month. Scanner data, which are used together with field survey price information in the compilation of indices for non-seasonal food items and non-alcoholic beverages, cover the first 14 days of the month. The introduction of scanner data was assessed not to have a significant impact on the compilation of the indices for the product categories in which this new data source was introduced (¹).

The prices for diesel, petrol and gas for domestic heating, are collected on-line on a daily basis between the 1st and the 21st of each month. For used cars, prices are collected from a private data provider. For certain services (e.g. repair of the dwelling, some health services), which are deemed to display some price stability, the prices are collected only every three months. In the month when no price is collected, the last observed price is carried forward. Situations in which a product was available for a price and subsequently put on the market free of charge (as happened in March 2020 with the introduction of free public transport within Luxembourg), are reflected in the index.

Prices for rents are collected through a dedicated rents survey. The survey follows the same dwelling over time and not the tenant, which allows to capture rent price changes when there is a change in the tenancy of the same dwelling. Prices for public health and social protection services are included in the index net of reimbursements. As regards insurance, actual premiums are recorded.

(¹) An assessment of this impact on the Luxembourgish CPI is available here: <https://statistiques.public.lu/catalogue-publications/economie-statistiques/2018/97-2018.pdf>.

Prices for services are included in the HICP for Luxembourg in the month in which the consumption for the service commences. For flights, prices are collected two to three months in advance of the month in which consumption starts. Package holidays are collected three, four and five months in advance for winter, summer and all-year-round destinations. For accommodation services, the majority of prices are collected in January of each year when the yearly catalogue of the Luxembourg tourist office is published and, where available, throughout the year using the internet.

Compliance

The price collection is not fully in line with the legal requirements. For domestic services by paid staff and child care services, prices arrive with a lag and are not included in the HICP in the month in which the consumption of the service takes place, as required by no. 2, Article 8 of Regulation 2020/1148.

Requirement

Statec should ensure that observed prices for services shall be included in the HICP for the month in which consumption of the service can commence.

6. Replacement and quality adjustment

For prices collected through the field survey, the price collector is responsible for selecting replacement products. As a rule, replacements are carried out following a most-sold approach and having in mind the product description and an assessment on its temporal availability on the market. Price collectors are also in charge of making an assessment on the comparability between replaced and replacement varieties.

Statec essentially uses bridged overlap, overlap pricing and direct comparison methods to control for quality change. The incidence of these methods varies across ECOICOP divisions. For instance, while for food products the most used method is bridged overlap, for clothing and footwear products direct comparison is used the most. Option pricing is used for the explicit adjustment of the quality of new cars. In addition to new features, changes in car engine (horse power) and in consumption performance are also considered for option pricing adjustment. The method is applied to a few cases per year, as the sample is re-designed every year according to figures on new registrations of cars (based on figures of the national car register, which distinguish between business car and household car purchases). The most popular brands and models for each segment for year t are selected on figures of year $t-1$. In the case of second-hand cars, age and mileage are controlled for in the data that is obtained through a private data provider.

In the case of prices received through administrative data files, such as pharmaceutical products, where information regarding all transactions is provided, the overlap pricing method is usually applied for the replacement of a variety. In the case of scanner data, a monthly resampling and chaining principle applies, where the production system identifies, based on the same GTIN/European Article Numbering (EAN) code and label, the pair of adjacent varieties to be compared in two consecutive months. Currently, the system does not identify situations in

which different EAN and label codes do refer to the same variety, and may be missing out price changes associated with relaunches.

Compliance

The application of quality adjustment methods in the HICP for Luxembourg is in line with the legal requirements.

Recommendations

- Investigate the possibility of using web-scraped prices and characteristics data on electronic goods in the application of explicit quality adjustments for these goods.
- For scanner data, investigate ways of identifying relaunches and of reflecting its impact on prices in the index.

7. Treatment of seasonal products

Statec applies the seasonal imputation method for the compilation of fruits, vegetables, and clothing and footwear products since 2011. The imputation of out-of-season prices is done following the all-seasonal estimation approach. However, while for fruits and vegetables the first out-of-season period corresponds to the average of the prices for the months which are in-season, for clothing and footwear products the first out-of-season price is estimated to be equal to the last in-season price.

Although package holidays includes summer and winter destinations, it is not treated as a seasonal product in the HICP for Luxembourg. This is a product that typically shows strong seasonal patterns and for which its availability changes considerably within a year. When winter and summer holidays are out-of-season, the last observed price is carried forward.

Compliance

The treatment of seasonal products is not fully in line with the legal requirements. For package holidays, where winter and summer in- and out-of-season periods exist, the index is not compiled using the seasonal imputation or seasonal weights methods, as required by Article 14 of Regulation 2020/1148.

Requirement

Statec should treat products that are only available for purchase in significant amounts in part of a year as seasonal products and included in the index using a seasonal method.

8. Index calculation

The HICP produced by Statec is compiled as an annually chain-linked Laspeyres-type index, with December of year $t-1$ being used as the price reference period and the link month for indices compiled in year t .

The Jevons (geometric mean) formula is applied at the lowest levels of aggregation of the index. Elementary aggregates are generally defined at a seven to 10-digit classification level for which

elementary price indices using scanner data and other data sources are compiled. While for the latter data sources, the geometric average is calculated by comparing the price of the current year to the price of the December month of year $t-1$, the elementary price indices based on scanner data are calculated following a monthly resampling and chained approach ('dynamic basket method'), where the Jevons price index is calculated chaining together short-term price indices that compare the prices of most sold products in two consecutive months.

The 'dynamic basket method' to the compilation of price indices based on scanner data is robust to chain drift bias and safeguards index transitivity. Statec has changed from this bilateral index formula to a multilateral index formula in January 2021.

Compliance

The index calculation of the HICP for Luxembourg is done in line with the legal requirements.

9. HICP at constant tax rates and administered taxes

Statec compiles the HICP at constant tax rates (HICP-CT) in line with the reference methodology established by Eurostat. Changes in the tax rates are reflected in the HICP-CT for Luxembourg in the first entire month for which a new rate is applicable. Rate changes that enter into force later than the first day of a given month are reflected in the HICP-CT of the following month.

The list of the product groups for the compilation of the HICP-AP is reviewed and transmitted each year to Eurostat in line with the recommendations established for this particular index. Liquid fuels (for domestic heating purposes), diesel and petrol are not categorised as administered. The prices covered by these sub-groups are considered not to be significantly influenced by the government. Although the government defines maximum price levels, they are subject to daily changes, which are triggered by an automatic price adjustment mechanism reflecting the evolution of the market (as measured by the cost, insurance and freight Antwerp fuel prices) and of the dollar exchange rate. When compared to neighbouring countries, prices for oil products in Luxembourg evolve in a very similar way and show the same price trends.

Compliance

Compilation and regular transmission of the HICP-CT for Luxembourg is in line with the legal requirements.

10. Follow-up from the previous compliance report

The main findings from the previous compliance monitoring report were published in [October 2012](#). The recommendations made in this compliance monitoring exercise were essentially taken into account by Statec, which has extended the price collection period from the first two weeks to the first 21 days of the month in 2016 and investigated the degree to which price developments for cars and repair services were accurately portrayed by the HICP for Luxembourg.

11. Overall assessment

On the basis of the information listed in section 1, Eurostat assesses that the HICP for Luxembourg is in line with most legal requirements. Statec should improve the compliance by implementing the requirements formulated in sections 5 and 7. Notwithstanding these issues, Eurostat assesses the HICP for Luxembourg to be comparable to that of the other EU Member States. If Statec follows up on the recommendations given in sections 2, 3, and 6 the comparability of the Luxembourgish HICP will improve further.