

Measuring inflation : the stakes and the state of play

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Introduction

As is the case every eight years, the major overhaul of the national consumer price index (NCPI), upon which the health index is based, is currently under way. The new index, with a fully updated weighting structure, will enter into force in January 2014. In addition to a complete update of the index's weighting structure and the addition and removal of certain products in order to better reflect households' new consumption patterns, the reform is also an opportunity to adjust the methodology to make inflation measurement more accurate and ensure that the index is representative. It is also hoped that the reform will contribute to convergence between the national index's methodology and the methodology that Eurostat sets out for the harmonised index of consumer prices (HICP), whose weighting structure is updated more frequently. Notable reforms being considered for 2014 include: the switch to a chain index with annual weighting changes instead of a fixed base, the use of scanner data rather than price collections in supermarkets, and better accounting for substitution effects (changes in consumption quantities in response to relative price movements).

Furthermore, at the government's behest, two changes to the national index went into effect ahead of schedule, in January 2013. First of all, the effect of seasonal sales is now taken into account when compiling prices, as was already the case for the HICP, with the difference that the impact is spread proportionally over the entire year as opposed to just the sale months. Second, a "payment" approach (trailing 12-month moving average) has been adopted for heating oil contracts.

These changes are more than just a question of methodology; they also have economic consequences and are intertwined with the debate over automatic wage indexation and the debate over labour cost trends, the wage gap with neighbouring countries and competitiveness. This article shows not only that these changes have an impact on the level of inflation – temporarily, when they are introduced – but that they can structurally alter inflation trends and volatility, which influences the wage indexation via the health index.

With this in mind, the reforms made in January 2013, which allow the NCPI to reflect consumption habits more quickly and more accurately, should be encouraged, notably to avoid overestimating consumer price inflation.

This article aims to highlight the key differences between the two inflation measures that exist side by side in Belgium, i.e. the NCPI and the HICP, and to clarify recent changes and proposed improvements that could still be made as part of the major reform process. The first section describes the two indices, touching on some core principles and analysing the differences in inflation as measured by the two indices, as well as the changes made to the two indices in January 2013. The reforms adopted for the HICP also give some indication of the impact that similar changes being considered for the NCPI in 2014 might have. Where possible, we have estimated the impact that the changes would have on inflation. The second section deals with accounting for substitution effects when measuring inflation. The current method of supermarket price collection is explained in detail, as are the possible future alternatives. Natural gas and electricity prices are also used as an illustration. The third section covers the challenges of incorporating housing costs,

^(*) The author would like to thank D. Cornille for his contribution to this article.

discussing real rents and the cost of owner-occupied housing, an expense currently absent from both the HICP and the NCPI.

1. Two price indices share the stage

1.1 The differences between the national index and the HICP

Belgium's national consumer price index (NCPI) has a long history going back to 1920. The methodology of the index, which generally strives to measure changes in the cost of living, has changed significantly since the early days, as has the way it is used. Today, the NCPI and, since 1994, its so-called health index variant (which is the NCPI excluding products deemed detrimental to health, such as petrol, diesel, alcohol and tobacco), are used as a benchmark for indexing wages, social benefits or rents. This is why compiling and calculating the NCPI calls for cooperation between labour and employer representatives in the Index Commission and the National Labour Council. This dialogue is unique to Belgium and has been held in various forms from the inception of the index.

In practice, the NCPI is calculated monthly by the Consumer Price Unit of the Directorate-General for Statistics and Economic Information (DGSEI) of FPS Economy SMEs, Self-employed and Energy, using the methodology approved by the Minister of Economy based on the recommendation of the Index Commission. The index is not published until after it has been approved by the Index Commission. If there is disagreement within the Commission, the Minister of Economy has the final say. Since the January 2013 index, union organisations have decided no longer to approve the index, but rather to abstain in response to the way the two methodology reforms (impact of the sales and "payment" approach for heating oil) were introduced ahead of schedule at the government's request as part of a series of measures to support employment and competitiveness. Since the September 2013 index, employers' organisations have also been temporarily abstaining because they consider that the methodology used to account for phone tariffs causes inflation to be overestimated.

Like Belgium, the other European countries have consumer price indices designed for specific purposes, and the methodological differences among them are in some cases significant. Because of these differences, which were even more pronounced some 15 years ago, a need was seen for a harmonisation of indices within the EU. This was the context that gave rise to the HICP⁽¹⁾. It has

been published since 1997, with data extrapolated back to 1995 (for certain countries, data for the principal components are even available back to 1990). The HICP was first used in the context of the Maastricht Treaty convergence criteria⁽²⁾ and it continues to play this role for new EU Member States attempting to join the euro area⁽³⁾. Since the start of phase III of EMU, the index has played a direct role in the quantitative definition of euro area price stability, which is central to the Eurosystem's monetary policy strategy. The ECB Governing Council has defined price stability as an annual increase in the euro area HICP of less than, but close to, 2 % over the medium term.

The national HICPs are calculated at the national level using methodology harmonised by Eurostat and consistent with specific European legislation. However, the national statistical institutes have a certain amount of autonomy with respect to their methodology choices, as harmonisation is still an ongoing process and some differences in methodology persist. Eurostat is also responsible for calculating aggregate data for the EU and euro area. In Belgium, the Consumer Price Unit of FPS Economy, SMEs, Self-employed and Energy calculates both the harmonised index and the NCPI. However, the Index Commission does not intervene at any point in the index's calculation or publication. The index is published simultaneously by FPS and Eurostat, which publishes the HICPs of the other EU countries and that of the euro area overall, which is based on an aggregate of the national HICPs.

Since 2010, the HICP weighting structure has been based not only on the household budget survey (HBS), but chiefly on national accounts data, as recommended by Eurostat⁽⁴⁾. Thus, weightings for the year 2013 reflect the most recently available national accounts, i.e. those of 2011, although the 2010 HBS was used where national accounts data lacked sufficient detail. The FPS also uses external sources that provide it with highly detailed surveys in order to set the weightings of certain specific products (for example, cars and travel). In addition, prices are updated to adjust spending in the national accounts for relative price movements between December 2011 and December 2012. The weightings in the national index are still based on the HBS and external sources for the specific products. Even though adjustments were made within some of the major product categories in the mini-reforms

(1) Council Regulation (EC) No. 2494/95 (1995), which took effect in January 1997.
(2) The Treaty was signed in 1992, before introduction of the HICP, but already made reference to inflation calculated using a consumer price index with a comparable basis.
(3) Article 1 of the Protocol on the convergence criteria of the Treaty (Art. 121) stipulates that "the criterion on price stability... shall mean that a Member State has a price performance that is sustainable and an average rate of inflation, observed over a period of one year before the examination, that does not exceed by more than 1½ percentage points that of, at most, the three best performing Member States in terms of price stability".
(4) Application of EC Regulation No. 1114/2010, binding from 2012.

TABLE 1 CORE PRINCIPLES OF THE TWO CONSUMER PRICE INDICES IN BELGIUM

	National index (NCPI)	Harmonised index of consumer prices (HICP)
Created	1920	1997 (data since 1995)
Goal	Measure cost of living changes Act as a benchmark, via the health index, for indexing wages, social benefits, rents and other regulated prices, with the aim of preserving households' purchasing power	Measure inflation and purchasing power changes in a comparable manner in the various EMU countries References – convergence criteria (Maastricht) – quantitative definition of price stability in the euro area (ECB)
Calculated and published monthly by	FPS Economy – DGSEI Approved by the Index Commission (labour and employer representatives)	FPS Economy – DGSEI (Belgium) Eurostat (Belgium and euro area) Independently from the Index Commission
Methodology set by	Minister of Economy, based on the recommendation of the Index Commission	Eurostat and European legislators, but national statistical institutes are granted some autonomy
Statistical source used for weighting structure	HBS (Household Budget Survey) External sources (highly detailed surveys) for the weighting of certain specific products	National accounts (since 2010) HBS when the level of detail in the national accounts is inadequate External sources (highly detailed surveys) for the weighting of certain specific products

Sources: DGSEI, NBB.

of 2008 and 2010, their weightings remained as they were set in the previous major reform of 2006, which was based on the 2004 HBS. The 2014 major reform offers an opportunity to base the national index's weightings principally on the national accounts instead of the HBS.

Belgium is not the only country that has two indices; most euro area countries do. However, in theory, there is no reason to have multiple inflation measurements. For the purposes of both protecting purchasing power and making monetary policy, inflation measurements should be as accurate as possible and meet the most exacting standards of methodology. Furthermore, there is no contradiction between the two indices' goals because preventing a loss of monetary value (decline in purchasing power) is at the heart of any monetary policy with a focus on price stability.

Conversely, the significant methodology differences that remain could undermine the inflation measure's credibility with the general public, especially if they lead to divergent inflation profiles, as is the case with how frequently

the weighting structures are updated, which is different for the HICP (annual revisions) and the NCPI (every eight years). The latter less accurately reflects consumption habits with every year that passes since the previous revision.

The fact that the national index is less representative of trends in consumption patterns is particularly meaningful in the case of energy products. Since the previous major reform, energy prices have spiked on two occasions, in 2007-08 and 2010-11. These price increases led households to seriously alter their behaviour and reduce their energy consumption. This phenomenon can be seen in the weightings of the HICP, which are updated annually and show that, stripping out the increase in the relative prices of energy products, which naturally gave rise to a larger weighting of the energy component in the average consumption basket, the weight of energy intrinsically declined. If we look solely at the change in relative prices between 2004 and 2013, we see a clear increase (+42 thousandths for the NCPI and +43 thousandths for the HICP) in the weight of energy in the consumption basket linked to the stronger

increase in energy prices compared with the total index. From this standpoint, we can consider that the national index, and thus also the health index, overestimated inflation, granting energy a greater weight than it warranted in reality, whereas the HICP, owing to its annual revisions, took into account the intrinsic decline in energy consumption, whose weight increased only 18 thousandths in the HICP. As a consequence, inflation according to the national index is consistently higher than it is according to the HICP during periods of rising energy prices.

The intrinsic decline in the energy weighting was principally offset by an increase in the weight of the services category, notably the “social welfare spending” and “hospitalisation” sub-categories. This is chiefly attributable to the change in source and the switch from the HBS to the national accounts. In the HBS, consumers such as the elderly and those living in collective housing (nursing homes) are under-represented owing to the way survey data are collected. But the relative weight of health-related spending in these consumers’ basket of goods and services is significant. On the other hand, the weight of the category of non-energy industrial goods is weaker, reflecting mainly a decrease in spending on vehicles and publications.

Another example of obsolescence in the weighting structure has to do with fixed-line telephone services. Based on the 2004 HBS, this category still has a relatively high weighting in the national index (17 thousandths), even though it has declined sharply in the HICP in recent years (6 thousandths in 2013). Thus, when the incumbent operator’s tariffs increased sharply in May 2013, the impact

on NCPI inflation (+0.1 percentage point) was stronger than it was on HICP inflation (+0 point).

In recent years, the various methodology differences have given rise to inflation gaps when the effects have not been offset or have realigned at different rates. The gap between the trends in the national and harmonised indices since 1999 has undergone contrasting phases.

Up until 2004, the year-on-year monthly changes in the HICP were by turns equal, greater than or less than those of the national index. In 2004-05, on the other hand, the national index systematically rose more quickly (by 0.25 percentage point annually) than the HICP. This is primarily attributable to the fact that, unlike the HICP, the national index weightings are not revised annually, and that they still dated back to the 1995-96 HBS. Because the HICP is revised annually, it can be expanded to include new goods and services that are being consumed in significant quantities. And in fact, the prices of these products, such as mobile phones and personal computers, declined substantially, but the trend was not reflected in the national index. In addition, the price reduction was accentuated by the fact that the HICP methodology provided a way to adjust for changes in the level of personal computer quality.

The 2006 reform of the national index, based on the 2004 HBS, expanded the index’s coverage to goods and services that were being consumed in significant amounts. From 2006, the two indices’ movements were thus very similar. However, the annual changes in the national index were heavily influenced to the downside in 2006 owing to the terms under which the new index had been introduced.

TABLE 2 OBSOLESCENCE OF NATIONAL INDEX WEIGHTINGS
(thousandths; in red/blue: differences relative to 2004)

	Energy	Energy included in the health index ⁽¹⁾	Food products	Services	Non-energy industrial goods	
	NCPI	HICP	HICP	HICP	HICP	
Weightings in 2004	96	94	59	202	376	328
2004 weightings adjusted to account for relative price changes between 2004 and 2013	137	138	88	211	366	287
Weightings in 2013 according to the HICP		113	68	212	395	279
Effects of changes in consumption habits		-25	-19	+1	+29	-8

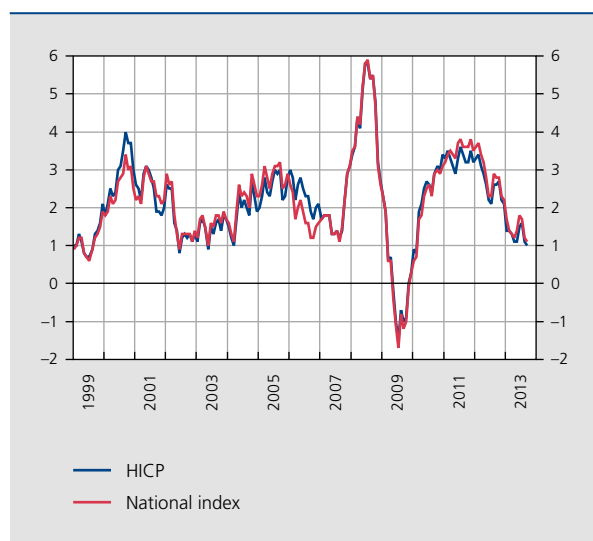
Sources: DGSEI, NBB.
(1) Electricity, gas, heating oil and solid fuels.

The conversion coefficient used to switch from the old national index to the new one was based on the average respective levels of the two indices in 2004. Thus, the surplus in the inflation measurement accumulated since 2004 by the old index was, in practice, entirely offset in 2006.

In addition, it was decided in 2006 that there would be a mini-reform of the national index every two years to allow for the possibility of adding in new products while keeping the weighting of major product groups constant. As a result of the 2006 reform, annual variations in the two indices were virtually the same for three years, between 2007 and 2009, despite yearly adjustments to the weightings of the HICP.

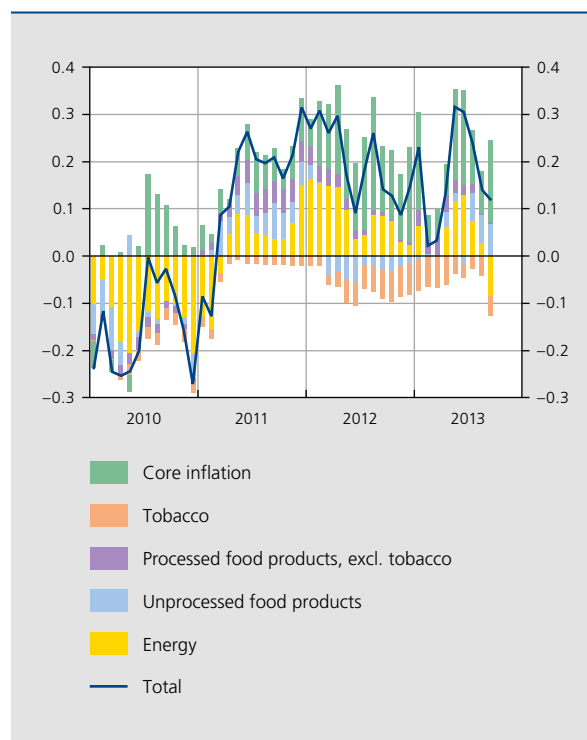
Starting in 2010, the gaps began to widen in the wake of two methodology changes made in January 2010. On the one hand, the new method for treating seasonal products in the HICP was put into place, causing a bias in year-on-year changes in 2010. On the other hand, the HICP weighting structure ceased to be solely based on the HBS, but principally on the national accounts, as recommended by Eurostat. This caused differences in the way the two indices were weighted, both at the level of the major product groups in the overall index and with respect to the products within each major group. The weighting differences that had a profound impact on the gap between the two indices were notably the greater weight of tobacco in the HICP and, above all, the divergences on energy products.

CHART 1 INFLATION GAP BETWEEN THE TWO INDICES⁽¹⁾
(percentage change compared to the corresponding month of the previous year)



Source: DGSEI.
(1) Excluding effect of seasonal sales.

CHART 2 CONTRIBUTIONS TO THE INFLATION GAP BETWEEN THE TWO INDICES⁽¹⁾
(percentage points)



Sources: DGSEI, NBB.
(1) Excluding effect of seasonal sales and adjusted for the methodology change regarding foreign travel in the HICP in 2011.

Core inflation (non-energy industrial goods and services) has also helped widen the gap between the two indices' trends since 2011 (effect of seasonal sales excluded). This is notably due to the fact that the national index still gives greater weight to the categories of notary fees and fixed-line telephone communications, whose prices increased significantly, whereas the HICP gives greater weight to mobile phone communications, whose prices fell. As for non-energy industrial goods, the difference was mainly attributable to products such as personal computers, whose weight in the HICP is greater, not to mention the fact that the HICP quality adjustment is greater than that of the national index. The two factors combined to keep HICP inflation lower.

1.2 The January 2013 reforms to the national index

Because the national index's higher level of inflation has an impact on wage indexation, in January 2013 the government decided to go ahead with two methodology changes to the national index. These changes, made prior

to the major reform of the national index in January 2014, were part of an effort to boost employment and competitiveness and to contain wage growth.

The first change is the inclusion of the seasonal sale effect, which is already included in the HICP, in the NCPI. This inclusion naturally had a temporary impact on year-on-year inflation in 2013. The impact will disappear in January 2014 and from that point on, the sales will have only a minor influence that will depend upon their extent relative to the previous year.

However, whereas the HICP concentrates the impact of markdowns in the months when the sales are held, i.e. January and July, and thus has two temporary dips each year, it was decided that for the national index the impact should be spread out over the full year. In other words, the impact of the January sales is spread out over the first six months and the impact of the July sales is spread out over the last six months.

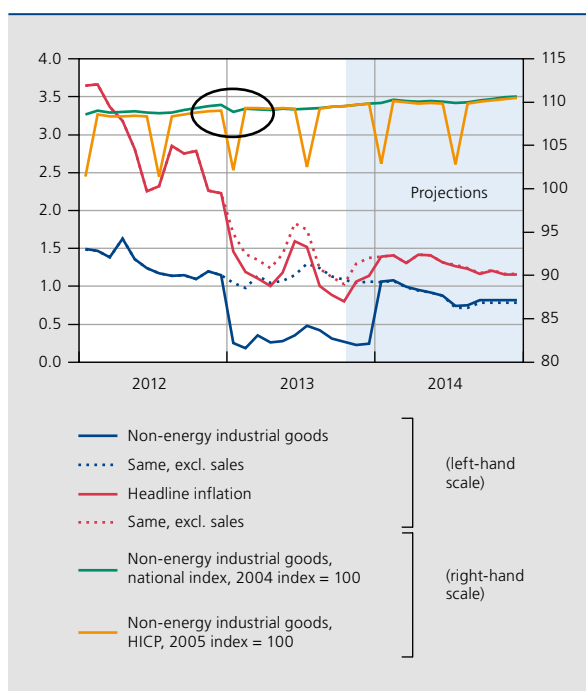
The goal of spreading the markdowns' impact over the full year was to avoid creating disruption between collective labour agreements (*conventions collectives de travail*, or CCT) with respect to wage indexation. Had the change of including the sales affected only the January and July indices, we might assume that – barring an adjustment of CCTs – wage indexation in certain branches of the economy would not have been affected, as indexation mechanisms vary from one CCT to another and the reference periods are not all the same. Thus, CCTs whose reference period excludes the months of January or July would be unaffected. Such is the case of the joint committees for which automatic wage indexation takes place only once a year, in January. These committees cover around a quarter of private sector employees. In theory, then, the inclusion of the sales would have had no impact on these wages because the indexation is based on the average of the previous four months, i.e. September to December, during which there are no sales.

Until the end of 2012, the fact that the sales were included in the HICP but not the NCPI was liable to cause temporary divergences (in January and July) between the two indices depending on the scale of the price markdowns relative to the previous year. The decision to spread the effect of the sales over the entire year in the NCPI means that this divergence will persist, even though the sales are now also factored into the NCPI.

According to the national index, the January 2013 sales lowered headline inflation by 0.24 percentage point. The July 2013 sales impact was not communicated by FPS Economy, but it is estimated to be 0.23 percentage point.

CHART 3 IMPACT OF INCLUDING THE SEASONAL SALES EFFECT ON NATIONAL INDEX INFLATION

(percentage change compared to the corresponding month of the previous year)



Sources: DGSEI, NBB.

The impact on overall 2013 inflation will thus be of a similar order, automatically lowering the health index by 0.26 point.

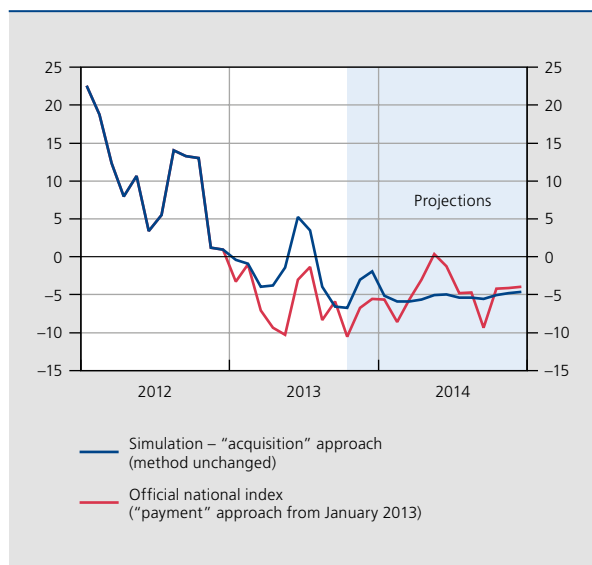
The second change made ahead of the major reform is the switch to a “payment” approach for heating oil contracts. Previously, the index had applied the “acquisition” approach, which means taking into account the prices in force at the time inflation is calculated, whereas the “payment” approach uses the average price over the past 12 months, as reflected in the annual invoices actually paid by consumers. This change could slow the transmission of energy commodity price changes to the consumer price index, although earlier studies on the impact of this kind of methodology change were unable to arrive at a unanimous conclusion⁽¹⁾.

Furthermore, the government has studied the possibility of returning to the “payment” approach for fixed-price natural gas and electricity contracts, or even all contracts in the two categories. This approach was used in the past, but since 2007 the “acquisition” approach has

(1) Cornille D. (2009), “Methodology or pricing: how can the greater volatility of consumer gas and electricity prices in Belgium be explained?”, NBB, *Economic Review*, December, 47-57.

CHART 4**INFLATION RATE OF THE HEATING OIL CATEGORY**

(percentage change compared to the corresponding month of the previous year)



Sources: DGSEI, NBB.

been applied to price collections of both products, as per Eurostat's guidelines for the HICP.

Considering the current context of lower year-on-year energy prices, notably owing to the drop in Brent crude oil prices in euros over the same span, the switch to a "payment" approach for heating oil is putting upward pressure on NCPI headline inflation because it now takes into account prevailing prices during the past 12 months, the average of which is currently higher than the price applied during the month in which inflation is calculated. The impact is estimated to be +0.07 percentage point for 2013, whereas our last projections for 2014 put the impact at -0.01 point. In light of the significant price cuts made by the principal gas and electricity suppliers from January 2013, when the 2012 freeze on upward indexation ended, the switch to a "payment" approach for gas and electricity would also have pushed inflation upwards.

1.3 The January 2013 reforms to the HICP

Unlike the basket of goods and services used to calculate the national index, which remained unchanged, the HICP basket was revised, as it is every year, when the index was published in January. This revision involved adjusting the basket's weightings based on the 2011 national accounts and the most recent available household budget survey (2010). These weightings were then updated for 2013,

taking into account relative price movements between December 2011 and December 2012. Forty-two products were added, representing a weight of 4%, and eight were removed. The combined impact of these additions and deletions on HICP headline inflation is estimated to be +0.1 percentage point for the first nine months of 2013.

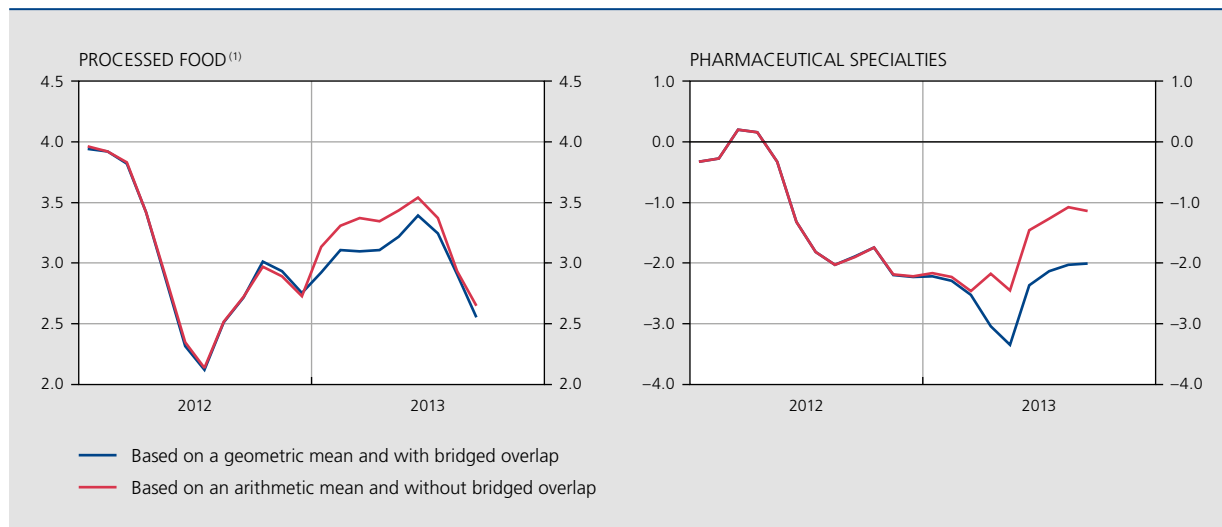
In addition, the January 2013 HICP publication also marked the introduction of various methodology changes aimed notably at complying with Eurostat regulations. A decision was made to no longer adjust for seasonal effects in the foreign travel category, retroactive to the January 2011 index, and to use an "all-seasonal estimation" for seasonal products. Because the HICP is a monthly chain index, it makes sense to assert an assumption when handling the first month's collection, i.e. that for the month preceding the one in which a product becomes available, an imputed price is estimated based on the price trends of products in the same group (see Annex, point 9). Nevertheless, the impact on inflation remains limited considering the weight of the products in question in the index.

Furthermore, there is no longer a weighting associated with locality. Prices from different localities will henceforth be aggregated in a "simplified" way, which is to say that each locality will be equally weighted. This is warranted, on the one hand, by the fact that weightings are not necessarily identical for all product groups and, on the other hand, by the very strong correlation between the various local indices, given that the price trends they face are very similar, so the change also has very little impact.

The fourth change affects nearly all the products included in the index basket. It has to do with quality changes, which are now taken into account using the so-called bridged overlap method. Under this technique, when two products are no longer comparable from one month to the next, an imputed price is estimated for the preceding month based on the price trends of similar products that are still comparable. Until 2012, the "link to show no price change" was used, a method consisting in adjusting the base price in such a way as to entirely neutralise the price difference. This method is still used for the national index (see Annex, point 5). Other, so-called explicit methods are also available for taking quality changes into account, notably the "option pricing" technique in which option prices are used to measure the value of quality changes (given that, in many cases, certain characteristics of a new model were previously offered as options on an older model). With respect to the HICP, this method applies to PCs and cars, two products that frequently undergo significant quality changes. In the NCPI, option

CHART 5 IMPACT OF SWITCHING TO THE GEOMETRIC MEAN AND THE BRIDGED OVERLAP

(percentage change compared to the corresponding month of the previous year)



Sources: DGSEI, NBB.

(1) Weighting based on the national index.

pricing is also used for PCs and cars, but only 50 % of the estimated change in quality is taken into consideration on the assumption that consumers are not prepared to pay 100 % of the price of all the options corresponding to improvements made to the product.

The final change made to the HICP in January 2013 is the switch from arithmetic mean (Dutot index) to

geometric mean (Jevons index) for an entire series of products, including product categories surveyed in stores in all localities, television subscriptions (channel packages) and pharmaceutical specialties. The categories covered represent a weight of around 70 % in the HICP basket, whereas the arithmetic mean is still used for the national index. The geometric mean does a better job of measuring substitution effects between products, i.e. changes in

TABLE 3 RECAP OF THE ESTIMATED IMPACT OF THE JANUARY 2013 METHODOLOGY CHANGES CONCERNING THE NATIONAL INDEX AND THE HICP

(percentage point)

Reforms	Impact on		
	Harmonised index (HICP) 2013 Estimate	National index (NCPI) 2013 Estimate	National index (NCPI) 2014 Extrapolation / Estimate
Sales	(1)	-0.24	≈0.00
Payment approach (heating oil)	(1)	+0.07	-0.01
Weightings update	+0.11	(1)	(2)
Bridged overlap	-0.04	(1)	-0.04
Geometric mean			
Total	+0.07	-0.17	-0.05

Sources: DGSEI, NBB.

(1) Not applicable.

(2) Probably a downward impact.

quantities consumed in response to relative product price movements. This aspect is discussed further in the following section.

The impact of the HICP's switch to the geometric mean and the bridged overlap technique is illustrated by the gap relative to the NCPI trend for the categories that are affected by the change and are comparable from one index to another. To establish the gap, these categories must not only refer to the same products in both indices, but they must also be unaffected by other methodology differences. Processed food (if we calculate, for the HICP, the index for this category using the NCPI weightings to aggregate the sub-categories), and pharmaceutical specialties meet these criteria. In both cases, we note that inflation was weaker according to the HICP (the effect of no longer weighting by locality is assumed to be negligible), which tends to confirm that the geometric average does a better job of incorporating substitution effects (shift to less costly products), although taking quality changes into consideration may also have an impact.

The HICP inflation rate for processed food is 0.2 of a percentage point weaker over the first nine months of 2013, thus reducing headline HICP inflation by 0.02 point. The effects for pharmaceutical specialties come to respectively -0.6 and -0.01 percentage point. The combined impact of the two categories on HICP inflation is estimated at -0.04 % for the full year 2013.

The effects of the various changes are relatively modest according to the estimates that can be made at this point. However, it should be noted that following the downward impact of taking the sales into account in 2013, the NCPI is likely to be negatively affected again in 2014, notably as a result of the probable switch to the geometric mean and the bridged overlap technique for quality changes.

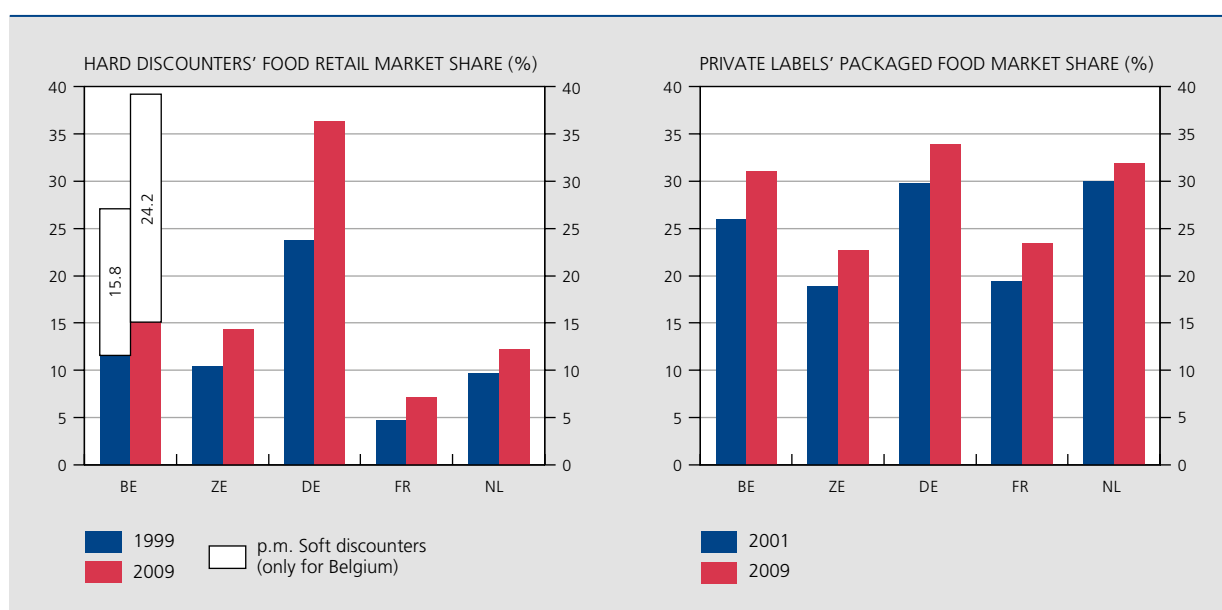
2. The substitution effect in inflation measurement

The substitution effect refers to changes in household consumption made in response to price movements. When the price of a good rises, consumers may choose to replace it with another good, or may continue to consume the good but opt for a different supplier or retailer, another brand or another kind of brand. Adequately accounting for this substitution effect when measuring inflation makes the measurement more precise and representative by better reflecting consumer behaviour in the wake of price movements.

2.1 Products sold in supermarkets

In the case of the retail sector, for example, consumers' reaction to price increases may have an impact on the structure of the sector if households decide to reduce

CHART 6 STRUCTURAL CHANGES IN THE RETAIL SECTOR



Source: Euromonitor.

their consumption of brand products in favour of private-label or white-label products, which tend to have lower prices, or to shop more at discounters as opposed to supermarkets. In recent years, the market share of hard and soft discounters has risen, as has that of private-label products, and Belgium is no exception. These shifts are not without consequences for price trends and inflation measurement.

Two kinds of problem can arise. First of all, when the sample is updated, the conditions under which new stores and new products are introduced are not neutral. In principle, the price level of a new store or product will not be the same as that of the rest of the sample or that of the store or product it is replacing. It makes sense to restate this price difference to reflect differences in quality (the service quality of the retailer in terms of location, store environment, presentation, staffing, number of check-outs, etc.). In practice, the national statistical institutes often use a transition method that attributes the entire price difference exclusively to a difference in quality (of the retailer's service level).

This practice, the failure to record a price decline, can cause inflation to be overestimated, unless there really is no change except a difference in quality. The literature often labels this problem "new outlet bias". But the success of the formats offering lower prices shows that consumers tend to think that the price difference more than offsets any difference in quality.

All in all, it is not easy to precisely quantify this bias and no estimate is available for Belgium or for the euro area. While estimates covering the 1990s in countries such as the US, Portugal, France and Germany show that this kind of bias was not very significant, the rapid recent changes in market share of the various kinds of retailers could conceivably amplify the bias. So not only are frequent sample updates important, it would also be desirable to have additional research done in this field, notably in order to correctly identify the scope of differences in quality.

Secondly, if the sample used to calculate the price index is not adapted to structural changes in the retail sector, there is a risk that the index will grow progressively less representative. This could lead to errors in measuring inflation, especially if price trends are systematically different for different kinds of store or types of product, and if the relative shares of different kinds of store or product change as a result. This is an argument in favour of frequently updating the sample of products included in the consumer price index, while keeping in mind that the index reflects changes in the prices of a basket of goods and services whose composition remained unchanged

over a certain period. In effect, as its name indicates, the price index is intended to reflect changes in price and not in consumption quantities, unlike a "unit value index" or "expenditure index".

In practice, for each item in the basket, agents collect prices every month in supermarkets and other types of store in 65 localities around the country. The prices of different brands and kinds of brand are naturally reported, but there is no explicit weighting of brands, kinds of brand or type of point of sale. However, in reality, there is an implicit weighting in the sense that the extent of the different points of sale and brands determines the location and number of the price collections. Thus, changes in the retail sector are reflected in the number of price collections made in each store. More specifically, a decision could be made to collect prices more frequently at a soft discounter than at traditional supermarkets in order to increase the weight of the former relative to the latter in the arithmetic mean, and thus to implicitly reflect its market share gains. The same technique can be used with respect to different kinds of brand.

The elementary aggregation of these price collections is calculated (until 2012 for the HICP) with the help of an arithmetic mean for each of the 65 localities. This approach based on the arithmetic mean has two drawbacks: first, the impact of price changes on the index depends on the level of the prices in question, which means that relatively expensive products (brand products, for example) carry greater significance than less expensive products (private-label or white-label products, for example); second, it assumes an elasticity of substitution equal to zero, reflecting a fairly unrealistic model of consumption behaviour that is completely uninfluenced by relative price movements.

Lastly, for each product, the indices of each locality are aggregated, with each assigned a population-based weighting, and which is thus the same for all products.

In January 2013, two changes were made to the HICP, which are also envisaged for the NCPI starting in January 2014. The first has to do with the now simple aggregation of the local indices, which are thus no longer weighted according to their population for the reasons cited earlier.

The second change is the switch to a geometric mean (Jevons index) for the elementary aggregation of product prices collected in stores. The geometric mean offers two material advantages over the arithmetic mean. It does not give greater significance to higher prices; in other words, the relative change in a price will have the same impact on the geometric average regardless of the price level.

TABLE 4 CONSUMER PRICE INDEX METHODOLOGIES FOR PRODUCTS SOLD IN SUPERMARKETS

Method up until 2012 for both indices	Method for the harmonised index (HICP) from 2013	Method envisaged for both indices from 2014
Fixed basket of goods Adjustment possible every year (HICP) or every two years (NCPI)	Fixed basket of goods for a one-year period	
	For each good: price collections of different brands and types of brand by agents in various supermarkets and specialty stores, with no explicit weighting	Use of scanner data for the prices of products sold in supermarkets in place of price collections in the 65 localities, with no explicit weighting
Arithmetic mean calculated for each of the 65 localities covered (Dutot index)	Geometric mean calculated for each of the 65 localities covered (Jevons index)	
Aggregation of the local indices with the help of weightings representing local populations	Simple aggregation of the local indices, with no weighting	

Sources: DGSEI, NBB.

Also, the Jevons index assumes an elasticity of substitution equal to 1. This means that by using this index, one implicitly assumes that quantities consumed fluctuate in proportion to price changes, which, from an economic standpoint, makes more sense than assuming an elasticity of substitution equal to zero.

The January 2014 reform offers a chance to partly replace the collections carried out by agents with supermarket scanner data. In theory, the availability of these data makes it possible to assign each type of retailer and each type of brand an explicit weighting at the elementary aggregation level. However, these data will probably not be

available for certain large retailers, and more specifically for hard discounters, which will continue to require in-store collection.

Thus, because the prices considered will be determined each month by checkout data, it may also be possible to specify each month the weightings assigned to each type of retailer and brand as a function of quantities sold as shown by the scanner data with the aim of better representing consumption and market share trends. This method, however, raises the issue of chain drift, which means that the price changes observed in a given month would have a permanent impact on the index.

TABLE 5 EXAMPLE OF CHAIN DRIFT

	January		February		March		April	
	Price	Quantity	Price	Quantity	Price	Quantity	Price	Quantity
Product A	2.5	10 000	2.0	500 000	2.5	2 000	2.5	10 000
Product B	3.0	10 000	3.0	10 000	3.0	10 000	3.0	10 000
Index ⁽¹⁾	100.00		84.78		96.35		96.35	

Source: DGSEI.
(1) Törnquist-type index.

The example below illustrates this problem. Let us assume that product A is on special offer in February, causing its sales to increase sharply in response to the lower price. This results in a steep drop in the price index. However, when prices and quantities return to their January levels in March, the index will not return to 100. The February promotion has thus had a permanent impact on the index, which is clearly problematic. This phenomenon also arises when prices rise, and over long periods, this type of index can tend towards zero or infinity. Based on this observation, the use of this kind of methodology has already been ruled out.

Another solution would involve setting the weightings at the level of elementary aggregation according to the types of retailer and brand, and to update them each year, based on chained indices. However, there is no preference for this method either, chiefly because numerous products disappear from store shelves from one month to the next over the course of the year, and sales fluctuate from one season to the next in the same year. Lastly, this method would make it impossible to introduce new products into the index basket.

Considering the drawbacks of assigning weightings at the elementary aggregation level, one possibility would be to do a simple aggregation at the elementary level, but to also include a geometric mean (Jevons index), as is the case for the HICP, which would make it possible to account for the substitution effect (equal to 1). Scanner data would partly replace the price collections done locally, and the weightings at the non-elementary level would be adjusted annually, in the image of the methodology used for the HICP, which would thus also mean switching to a chain index.

While scanner data cannot be used to assign weightings at the elementary level, they can determine the proportional representation of the various retailers and brands for the prices that will be included in the Jevons index calculation. This makes it possible to more accurately reflect respective market shares in practice. For example, when the market share of a retailer or brand expands, the number of prices related to it included in the index can be adjusted upwards to replace prices that correspond to declining market shares.

In the Netherlands, scanner data have been used since January 2010. They show that the products sold in supermarkets vary significantly from one period to the next, with numerous entries and exits, such that a fixed basket would quickly cease to be representative. Given the problem of chain drift posed by opting for explicit weightings that change from one period to the next, the Netherlands

chose to use a geometric mean with no explicit weighting at the elementary aggregation stage. As for the choice of prices used for each product when calculating the index, the Netherlands logically decided to give preference to the most representative prices by selecting around 50 % of available prices for each product, i.e. generally between 80 % and 85 % of total spending on the product. The national statistical institute was able to compare trends in an index based on the previous method (price collections and arithmetic mean) with the index based on scanner data and a geometric mean, and it appears that the latter systematically develops more slowly.

2.2 Natural gas and electricity prices

Like the retail sector, the natural gas and electricity markets have also recently undergone some substantial changes. In 2012, when the upward indexation of gas and electricity prices was frozen and the government carried out a number of initiatives (such as a “Gas and electricity: dare to compare!” ad campaign, publicising price comparisons, and doing away with fines for contract cancellation), a growing number of households decided to change their energy supplier; the percentage of network access points that changed supplier increased sharply. It nearly doubled in Flanders and Brussels, for both gas and electricity, and rose significantly in Wallonia, although the trend was not as pronounced as in Flanders.

This phenomenon caused large changes in the market share of the various suppliers. In the case of gas and electricity, there is in principle no difference in the product consumed (notwithstanding the range of services linked

TABLE 6 RELATIVE NUMBER OF NETWORK ACCESS POINTS THAT CHANGED ENERGY SUPPLIER IN 2011 AND 2012
(in % of the number of distribution network access points)

	2011	2012
Electricity		
Brussels	4.1	8.3
Flanders	8.2	16.5
Wallonia	8.6	11.6
Gas		
Brussels	4.7	9.3
Flanders	9.2	18.9
Wallonia	11.0	15.0

Source : CREG.

to certain contracts). That being the case, the substitution effect must be reflected in the price index trend. In other words, the fact that consumers change their supplier or contract to take advantage of better tariffs must have a downward impact on the index.

To measure changes in gas and electricity prices in the price index, the DGSEI takes into account the tariffs on contracts offered by the suppliers, as well as changes in these contracts' market shares, which makes it possible to include the substitution effect in the inflation calculation. The Price Observatory, basing its work on this methodology, estimated the impact of the substitution effect on the gas and electricity market by fixing market share from April 2012 onwards (start of the price freeze). According to its estimates, supplier changes had an impact of -0.3 percentage point in 2012 on the change in electricity prices, and a -1.2 point impact on gas price changes. The impact on the energy component of the HICP is -0.4 percentage point, while the impact on headline inflation is -0.1 point in 2012.

3. Housing costs in the price index

Housing costs are divided into two categories: so-called real rents, which are the rents actually paid by tenants, and the housing costs borne by residents who own their own home. With respect to the first category, it is possible to fine-tune the way the rents are reflected in the price index, as the rent index reflects primarily movements in the health index, smoothed and after a certain delay⁽¹⁾, and thus legal rent indexation in the context of a current lease agreement. Changes resulting from housing market dynamics, which have an impact on rent increases applied when a new lease is signed are thus inadequately taken into account.

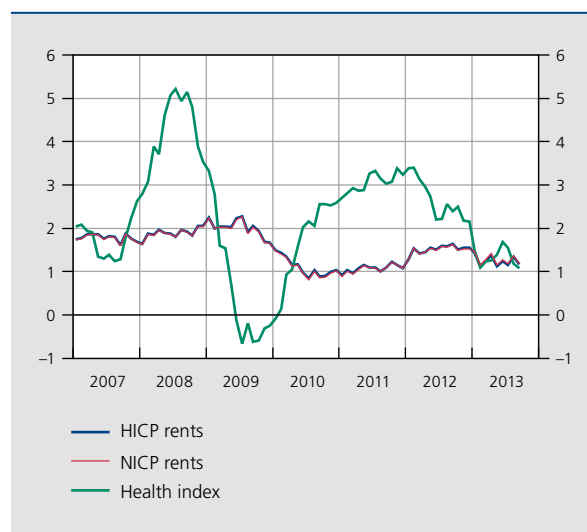
The method currently applied to rents is based on a sample of 1 800 tenants selected to comply (in terms of type of residence, facilities and number of rooms) with the results of the 2001 socio-economic survey. The elementary aggregate of reported rents is compiled by using an arithmetic mean because it implicitly assumes an elasticity of substitution equal to zero, which FPS Economy considers is more characteristic of the rental market than an elasticity of substitution equal to 1 (implicit assumption when using geometric mean).

In practice, one problem encountered in calculating the index is the fact that a growing number of tenants in the sample are not responding to the survey. Often, this phenomenon arises when a tenant leaves a residence and the subsequent tenant no longer replies to the survey.

CHART 7

REAL HOUSING RENTS AND HEALTH INDEX

(percentage change compared to the corresponding month of the previous year)



Sources: DGSEI, EC.

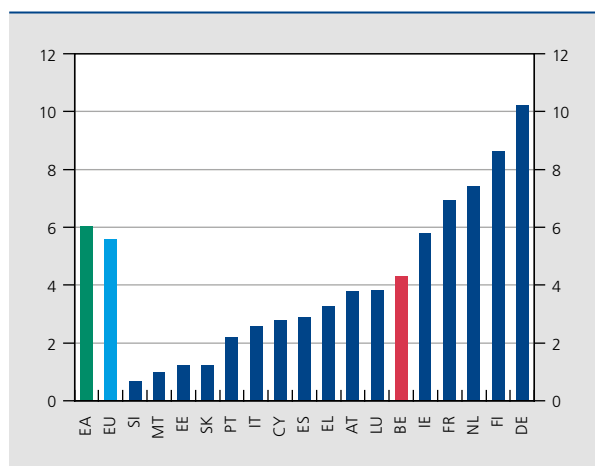
Furthermore, when a rental unit is replaced by another (with the same characteristics), the difference in rent is entirely neutralised, which is contrary to HICP rules. These two factors explain why the rent increases applied when new leases are signed are not adequately reflected in the index.

To remedy this shortcoming, the data source used to calculate the index could be changed to cadastral data on reported leases. In addition, to account for rent increases when a new lease is signed, the bridged overlap technique would be applied when a rental unit is replaced in the sample, which should have the impact of raising inflation.

While real rents are reflected imperfectly in the index, owner-occupied housing costs are currently left out of both the NCPI and the HICP. However, the structure of European households' housing is quite varied. The split between homeowners and renters differs considerably within the euro area. In southern Europe, the rental market is generally underdeveloped and the share of homeowner households is relatively high. In Germany, by contrast, the share of real residential rents in the HICP is over 10%, compared with just 6% on average in the euro area. In Belgium, the share of renters is fairly small, such that in HICP weightings, the category of real residential rents is barely more than 4% of the consumption basket.

(1) Given that each month, rents may only be indexed on lease contracts for which it is the anniversary of the signing, and only based on the value of the previous month's health index.

CHART 8 WEIGHTING OF REAL RESIDENTIAL RENTS IN THE HICP IN 2013
(percentage)



Source: EC.

These disparities are principally the result of national customs and housing market regulations (taxes, subsidies, tenant rights, etc.).

As a result, including real residential rents and excluding the housing costs of owner-occupiers compromises comparability among countries, given that these practices

are not neutral in terms of their impact on price trends, especially because the housing costs of owner-occupiers represent a significant share of their final consumption expenditure. For example, according to the most recent available household budget survey (that of 2012), these expenditures represent, according to the rental equivalence method (see box), 14% of average total expenditure in Belgium. It is important to point out that certain spending related to owning a home is nevertheless included in the price index basket. These include notary fees as well as certain maintenance and repair costs.

Taking into account the housing costs of owner-occupants should improve the coverage of the HICP and make it more comparable internationally, thus boosting its credibility. To this end, and in accordance with a European Directive, Eurostat is carrying out a project aimed at determining the most suitable practice for drawing up an owner-occupied housing index (OOH), to be subsequently included in the HICP basket. However, this project, in which the ECB is also participating, is complicated and also raises some important objections, so it is too early to say for certain whether the OOH index will be added.

The first objection stems from the legitimacy of including such an index in a consumer price index, given that owner-occupiers' spending related to their home is at least partly an investment and not consumption. Furthermore, there is also some debate over which methodology to adopt.

Box – The three methods by which owner-occupied housing costs can be taken into account

Different methods have been considered as part of the Eurostat project to establish an OOH index.

1. The **rental equivalence** method involves taking into account a theoretical rent based on the housing unit's characteristics. This method was not chosen, principally because it is based on imputed/theoretical values, a practice incompatible with the concept of monetary expenditure upon which the HICP is based (see Annex, point 1). Furthermore, the rental market is small in certain countries, which limits its representativeness, especially because its structure is different (more apartments and small houses) than that market of properties for sale. Lastly, one more objection is that the rental market differs significantly from the market for owner-occupied housing, and that it cannot be used as a proxy because in practice there is little correlation between rents and real estate prices.
2. In the **mortgage interest approach**, the cost of the housing is determined by the interest on the mortgage loan. Making this calculation requires monitoring outstanding mortgage loans over a long period, taking into account real estate price trends as well as interest rates, the breakdown between fixed- and variable-interest rate loans, etc. The biggest disadvantage of this method is that the loan amounts are influenced by real estate prices, meaning that the impact of those prices on the index will be felt for a long time.



- The **net acquisitions approach** involves taking into account all transactions linked to housing consumption, but only between the household sector and other sectors. Transactions between households are thus not taken into consideration when calculating the index or assigning weights. The transactions taken into account are the purchase of the home and additional expenses related to the purchase and the transfer of ownership (registration fees, VAT on new buildings, notary fees, etc.), as well as any major repairs and upkeep.

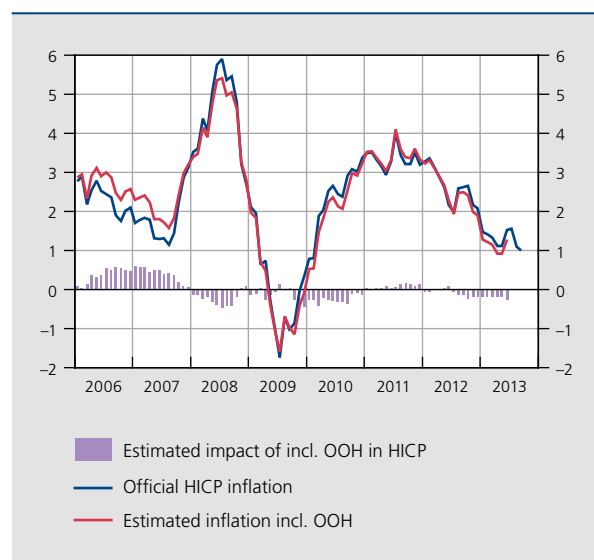
This net acquisitions approach is consistent with HICP rules and, actually, is the HICP standard, even though for most other categories, the difference between gross and net spending is minor. This method is warranted by the fact that when a property is sold from one household to another, the deal is an expense for one but revenue for the other, such that the net result is zero. Furthermore, the price of land is also excluded from the index, as land is considered the “asset/investment” portion of the acquisition, whereas the residence itself is the consumed portion. The difficulties inherent in this approach have more to do with its implementation, given that in practice, separating the price of the residence from that of the land is complicated (this is also true of the additional expenses), and it is also hard to distinguish between “intra-household” and “extra-household” transactions.

In light of the respective pros and cons of the various methods, the net acquisitions approach was selected for calculation of the OOH index, which will be quarterly and is expected to appear from the third quarter of 2014 onward. The index will be published in T+3, i.e. with a one quarter delay owing to the lag in the availability of sources. Eurostat is expected to issue an opinion on whether or not the OOH is suitable for inclusion in the HICP by 2018 at the latest.

Several countries, including Belgium, already calculate the OOH index on an experimental and confidential basis. A series exists for Belgium going back to 2005, based on which it is possible to simulate the impact of such a decision, keeping in mind that the spending reflected by the OOH index is substantial, at around 13 % of the Belgian household basket, which is due to the fact that the rental market is relatively underdeveloped.

According to our simulation, Belgian HICP inflation would have been respectively 0.3 and 0.4 of a percentage point higher in 2006 and 2007, whereas it would have been 0.2 point weaker in 2008, when commodity prices spiked. Including spending related to owner-occupied housing would thus have mitigated somewhat the strong inflation seen during this episode, according to the simulation. In recent years, the impact would have been negative again in 2010 and negligible in 2011, despite another significant rise in commodity prices. In 2012, inflation would have been 2.6 % had the OOH index been included, which is the same level as that of the official HICP.

CHART 9 SIMULATED IMPACT OF INCLUDING THE OOH INDEX IN THE HICP
(percentage change compared to the corresponding month of the previous year)



Sources: DGSEI, EC, NBB.

Conclusions

Given the use of the HICP in euro area monetary policy and the NCPI’s role in the indexation of wages and other prices, measuring inflation is not just a question of methodology. It also, and chiefly, has economic implications, notably with respect to monetary policy and competitiveness. That being the case, the inflation measurement obtained using a price index must be as accurate as possible, and it is vital for the measurement to be credible.

For the purposes of both protecting purchasing power and setting monetary policy, inflation measurements should be as precise as possible and meet the most exacting standards of methodology. Furthermore, there is no contradiction between the two indices' goals because preventing a loss of monetary value (decline in purchasing power) is at the heart of any monetary policy with a focus on price stability.

The significant methodology differences that remain between the two indices could undermine the inflation measure's credibility with the general public, especially if they lead to divergent inflation profiles. The 2014 reform of the national index thus offers a chance to bring the two indices more closely into line with each other, although the preference is to move the national index towards the HICP and not the other way around. For example, desirable NCPI reforms include the switch to a chain index, which would allow weightings to be updated more frequently (annually) and thus better reflect changes in household consumption habits. Furthermore, it would be beneficial to take quality changes into account more precisely and to better represent substitution effects by switching to a geometric mean at the elementary aggregate level. These changes, which would allow the national consumer price index to reflect consumer habits more quickly and more accurately, should be encouraged, notably to prevent overestimating consumer price increases.

Other changes are also desirable, for both the NCPI and HICP. The first involves switching to scanner data where possible and using the data not only to replace price collections but also to better represent fluctuations in the

market shares of different types of retailer and types of brand, even if this can only be done implicitly. It is also important to adopt a method suited to updating the sample. This will help lay the groundwork for future changes, such as the likely growth of online retailing. Furthermore, it will be helpful to apply the method used for gas and electricity to other products, such as mobile phone contracts, again in order to reflect market share changes and substitution effects. Lastly, pending a decision on whether or not to include owner-occupied housing costs, there are already some improvements that can be made to the index of real rents so that it more accurately translates rental market dynamics.

The changes made to the HICP in 2013 (geometric mean, bridged overlap) should, by our estimates, have a downward impact on NCPI inflation if they are adopted in 2014. This effect would thus accentuate the downward impact already recorded by the NCPI in 2013 as a result of the introduction of seasonal sale effects. Other reinforcing factors would include the use of a "payment" approach for heating oil, the switch to scanner data (as suggested by the Netherlands' experience) and applying the new methodology to telecoms. However, other methodology changes could mitigate the impact, notably the inclusion of a new index designed to better reflect rent increases at the time a new lease is signed. Lastly, it is important to keep in mind that the impact on inflation of all of these methodology adjustments will also depend upon the terms under which the new index is introduced. As it did in 2006, the Index Commission will have to determine the conversion coefficient used to transition from the old to the new index, which will influence the year-on-year change of the latter in 2014.

Annex – Principal methodology differences between the two Belgian consumer price indices

1. The concept of household final monetary consumption expenditure

The concept used for the HICP's coverage is that of household final monetary consumption expenditure (HFMCCE). This is the same principle applied to the NCPI since 1998. HFMCCE covers "expenditure made by households on goods or services for the direct satisfaction of individual needs or wants" (Council Regulation (EC) No. 1687/98). The concept of "monetary" in the context of the HFMCCE merits closer attention. "A monetary transaction is an economic flow that is an interaction between institutional units by mutual agreement, where the units involved make or receive 'payment'" (Council Regulation (EC) No. 1687/98). The requirement that a monetary transaction take place for a product to be included in the HICP is consistent with the idea that inflation is a monetary phenomenon, at least over the long term.

Initially, because practices were not identical in the Member States, products for which consumers did not pay the full price were not included in the HICP, although they were already included in the NCPI. Subsequently, it was agreed that, in keeping with the monetary concept, the prices recorded in the HICP should reflect the amounts actually paid by households, with deductions made for any reimbursements (such as co-payments, for example). This concept of net prices is also applied to the NCPI.

At present, owner-occupier housing costs are not included in the HICP; only rent that is actually paid is included, so the HICP differs materially from the national accounting concept, which includes both real residential rents and owners' equivalent rents. This significant difference stems principally from the fact that the concept used for HICP coverage is that of household final monetary consumption expenditure, whereas owners' equivalent rents are generally non-monetary in nature. Owner-occupier housing costs are also excluded from the NCPI. However, the possibility of including them is currently being studied (see section 3).

2. Geographic coverage

The geographic coverage of Belgium's HICP, like the HICPs of all other Member States, and thus of the euro area aggregate, refers to consumption within the territory of the respective Member States and the euro area (Council Regulation (EC) No. 1688/98). This means that the HICP's weighting structure is influenced by the purchases of foreign consumers (chiefly tourists) in euro area countries, whereas spending by member state residents abroad has no influence. The use of this concept makes it possible to avoid double counting or omissions when the individual member state HICPs are aggregated.

Conversely, the NCPI uses a "hybrid" concept that, like the HICP, excludes residents' spending abroad (spending in local currency done abroad while on holiday), but also excludes spending by foreigners inside of Belgium.

3. Demographic coverage

Both indices are based on the concept of an "average" representative household. However, spending by individuals living collectively (in a retirement home, for example) is covered by the HICP (Council Regulation (EC) No. 1688/98) but excluded from the NCPI. Using the concept of the "average" household as opposed to the "median" household implies that high-income households, which spend more, carry greater weight than low-income households in determining the representative basket of goods and services.

4. Coverage by type of retailer

While European legislation is not explicit on this point, the coverage of price collections by type of retailer must be representative. When the HICP and the 1996-based NCPI were introduced, they were brought into line with the results

of a study on the structure of the retail trade carried out in 1995. However, the details of the breakdown by store type remain confidential. Since there has not been a new study on the topic, the breakdown by point of sale has not been explicitly reviewed, either for the creation of the HICP or for the new NCPI.

Nevertheless, pragmatic adjustments are made when the points of sale visited are renovated or closed. Thus, in recent years, price collections have been conducted so as to account for the growing market shares of hard discounters such as Lidl and Aldi so that they will be reflected in the price index. Similarly, price collections in small specialised stores have been scaled back as those stores have lost market share to the big national supermarket chains.

Thus, this is an aspect where improvements could be made, and for which the FPS is preparing a methodology change as part of the 2014 reform. In the future, the use of supermarket scanner data should make it possible to more accurately account for changes in market share among the various types of store and brand, thereby reducing the risk of outlet substitution bias (see section 2.1).

5. Adjustments for quality changes

The HICP is supposed to measure the “pure” change in the price of a basket of goods and services whose quality remains constant. Any changes in price linked to quality improvements must be restated, which means that statisticians must determine what percentage of the total change in a product’s price – if there has been a change in quality – corresponds to a change in quality and what percentage is actually a price increase. A quality change occurs when a product’s characteristics are improved or when a product is replaced by a new model offering consumers a materially different level of utility.

For the HICP, the European Commission (Eurostat) defines a certain number of minimum standards that must be respected by the EU member countries. For example, “Where quality changes occur, Member States shall construct price indices by making appropriate quality adjustments based on explicit estimates of the value of the quality change”. Furthermore, the Commission states that, “In no case should a quality change be estimated as the whole of the difference in price between the two items, unless this can be justified as an appropriate estimate” (Commission Regulation (EC) No. 1749/96).

When two products are no longer comparable from one month to the next, the so-called bridged overlap method consists in estimating an imputed price for the preceding month based on the price movements of similar products that are still comparable. Quality changes can also be estimated using three so-called explicit methods: (a) the econometric method (hedonic regression); (b) using option pricing to measure the value of quality changes (given that in many cases, certain characteristics of a new model were previously offered as options on an older model); and (c) the expert judgement method. The choice of method depends, among other things, on the market structure for the product in question. The implicit method is in principle only valid if the market is transparent, flexible and competitive. These characteristics usually ensure that the longer a model is available on the market, the more its price will diminish as new, better models are released. Price differences observed in this manner serve as indicators of value that consumers attribute to changes in quality. However, the implicit method is still highly sensitive to the size and structure of the sample, and thus an explicit method is often preferred. The explicit methods offer the advantage of being independent of specific market characteristics. While the econometric method is undoubtedly the most reliable, especially for short-term movements, it is also more complex and more unwieldy. Thus, the option pricing method, which reliably tracks long-term trends, is generally considered the most cost-effective solution.

In Belgium, an explicit estimate of quality changes for PCs was introduced to the HICP in 2002. The estimates are based on option prices. Since 2006, an explicit estimate for PCs has also been used for the NCPI, but only 50 % of the adjustment is applied. Since 2006, the HICP and NCPI have both included an explicit estimate of quality changes for car prices, but here again limited to 50 % for the NCPI.

Furthermore, since 2013, the HICP has used the bridged overlap technique whereas the NCPI still uses the link to show no price change, under which method the entire price difference is neutralised by adjusting the base price when two products are no longer comparable. This can result in a bias.

6. Elementary aggregation

With respect to elementary aggregation, in principle the Commission does not dictate a choice between the two formulas for calculating elementary aggregate indices. Either the ratio between the arithmetic means of prices or the ratio between the geometric means can be used. Until recently in Belgium, only the former formula was used for most products, both in the HICP and in the NCPI. The only exception was car prices, PCs and air fares, for which a geometric mean was calculated for both the HICP and the NCPI.

The geometric mean offers two material advantages over the arithmetic mean. First of all, it does not give greater significance to higher prices; in other words, the relative change in a price will have the same impact on the geometric average regardless of the price level. Also, the Jevons index assumes an elasticity of substitution equal to 1. This means that by using this index, one implicitly assumes that quantities consumed fluctuate in proportion to price changes, which, from an economic standpoint, makes more sense than assuming an elasticity of substitution equal to zero. Since 2013, it has been used in the HICP to aggregate prices for an entire series of products, including products surveyed in stores, television subscriptions (channel packages) and pharmaceutical specialties. Thus, the geometric mean is now used for around 70 % of the HICP basket. For most services, the arithmetic mean is still used for elementary price aggregation. The switch to a geometric mean for the NCPI is one of the principal changes being considered as part of the 2014 reform.

7. Updating the index

The HICP's basket of products and their weightings are updated each year.

New products that represent at least one thousandth of final expenditure must be updated. Weightings must also be updated, as it is strictly forbidden to use weightings that are over seven years old or that, if they were changed, would have an impact on inflation greater than 0.1 percentage point. The new January 2013 weighting structure gives greater weight to the core inflation trend (notably spending on hospital care and social welfare), whereas energy products in the average household consumption basket have come down again, not counting the trend in relative prices. As a result, energy has a smaller weight in the HICP than in the NCPI which, combined with the decline in energy prices in 2013, contributed to a negative gap between the national index and the HICP, although the gap was mitigated by the switch to a "payment" approach for heating oil in the NCPI.

As for the NCPI, a major reform is done every eight years, but mini-reforms took place in 2008 and 2010 to add new products and adjust weightings, although the weighting changes did not affect those of the 12 major categories. In 2012, it was decided to forego the mini-reform given that the major reform was around the corner. One of the changes envisaged for the 2014 major reform is the switch to a chain index with an annually revised weighting structure, as is the case for the HICP.

8. Transactions between households

The net acquisitions approach used for the HICP excludes transactions between households because they involve income for one household and an expense for the other. This is why the weight of spending on used cars is lower in the HICP than in the NCPI. Thus, the "car purchase" category, which includes acquisitions of used cars, is weighted at 42 thousandths for the HICP compared with 63 thousandths for the NCPI.

9. Seasonal products

Starting in 2013, there is no adjustment for the seasonal effect for foreign travel in the HICP, in accordance with Eurostat rules. Official HICP data have been revised to reflect the change dating back to January 2011. It was also decided to use an "all-seasonal estimation" for seasonal products. Because the HICP is a monthly chain index (with a monthly comparison of each price collection), it makes sense to assert an assumption when handling the first month's collection,

i.e. that for the month preceding the one in which a product becomes available, an imputed price is estimated based on the price trends of products in the same group. Thus, for example, for asparagus prices collected between April and June, a price must be estimated in April for March (monthly chain index); this price is calculated as a function of movements in fresh vegetable prices during the period between the preceding months of June and March.

In addition, for the HICP as well, a switch was made in 2010 from a method in which the weightings of unprocessed foods could vary seasonally to a method in which they are set regardless of the time of year – provided prices can be collected. This is in keeping with Commission Regulation (EC) No. 330/2009, which is binding from 2011. Conversely, in the NCPI, product weightings vary over the course of the year depending upon the season and their availability.