



Statistics Netherlands

Division of Economic and business statistics and national accounts
Sector of Business statistics

BASE SHIFT IN INPUT PRICE INDEX BUILDING COSTS OF NEW-BUILD DWELLINGS, FROM 2010=100 TO 2015=100

Summary: This document describes the input price index of the building costs of newly constructed dwellings. It describes the changes that were implemented as a result of the base shift and includes the weighting scheme. The calculation method is not covered in this document.

Keywords: Dwellings, base shift, price index, input price index

Introduction

Every month, Statistics Netherlands (CBS) calculates the series New-built dwellings; input price indices building costs, to show changes in the costs (wages, materials) related to the construction of new dwellings in the Netherlands. From January 2018 onwards, this series is being published with 2015 as the new reference year. The new series is calculated ex post from January 2012 onwards. Changes in the weights due to price developments and stricter legislation have resulted in differences between the development of the old (2010=100) and the new (2015=100) series. This paper discusses the changes that took place during the base shifting process and the discrepancies between the index series based on 2010=100 and the index series with reference year 2015.

The first section contains a brief explanation of how the input price index was calculated on the basis 2010=100. Next, the changes made in the base shift to 2015=100 are discussed, as well as the effect on the input price index numbers. Finally, guidance is provided as to how to link the new series to the old series.

1. Input price index for building costs of new dwellings

An input price index is calculated on the basis of the price changes in the various cost components of the final product – in this case a new dwelling. The main cost components in the construction of a new dwelling are wages and materials. Other cost components such as energy and transport are not taken into account, because their influence on the final cost price is relatively modest. Land costs are also not included in the index figure. The wage and the material component of the input price indices are calculated as follows.

1.1 The wage component

The wage component monitors the cost development of wages (the labour factor) in the construction industry. This is done on the basis of statistics on contractual wage costs 'Contractuele LoonKosten' (CLK) in construction, i.e. the wage costs as were established through the relevant collective labour agreement (CAO). The CLK statistics use a wage cost concept that fits well with the concept of an input price index. This is because the employer's share of the wage costs is included and because quality changes such as changes in personnel structure do not play a role.

1.2 The material component

The material component shows price developments in the materials needed for the construction of one dwelling. For proper measurement, information is needed about the required building materials as well as about the cost ratios (prices and quantities) of the materials. This will ultimately produce a weighting scheme with weights per

product group (prodcom). A weighted index for the material component per reference project is calculated by using the weighting scheme and the producer price indices (PPI) belonging to each product group. Next, the project price indices are weighted to one materials index.

1.3 Total

The materials and wage components are averaged with weights into a single total input price index for each project. The ratio of the two components is derived from an analysis of eight different representative (dwelling) construction projects which serve as a reference. The eight project indices which are calculated accordingly are added up to arrive at one total index figure for the Netherlands. The weights used for this purpose have been derived from the statistic 'Newly completed dwellings'.

In the publication we provide not only the input price index total, but also the separate indices of the materials and wage components.

2. Changes in the Input price index

Several changes were introduced with the base shifting of the input price index. These are discussed below.

2.1 New reference projects

The general principles are re-assessed at every subsequent base shifting, as is the representativeness of the chosen models (dwellings). Research indicates that the models used for the series 2010=100 are no longer representative of the dwellings constructed around 2017. Due to innovations and more stringent requirements, it became necessary to choose new representative models. A total of eight new building projects have been selected, with each project representing one of various dwelling types (single-family dwellings and apartments) divided over three regions of the Netherlands (West, Central-South, and North-East). These projects are representative of the dwellings completed in 2017.

2.2 New weightings

There are three areas in the input price index where weights were adjusted. The first one is the adjustment of weights per type of dwelling. The second one is recalculation of the ratio between the wage and the material component. Thirdly, calculation of the ratios between the materials used, resulting in a new weighting scheme for the material component.

2.2.1 Dwelling type ratio

First of all, the ratios between all eight reference projects have been adjusted. The weightings are calculated based on the number of new dwellings completed in 2016 per region and type of dwelling for which a reference project is chosen, which are reported to Statistics Netherlands (for the statistic Newly completed dwellings). These shares are shown in Table 1.

Table 1: Dwelling type ratios per region

	Single-family dwellings	Apartments	Total
Region North-East	8.8%	7.9%	16.7%
Region Middle South	27.9%	13.5%	41.4%
Region West	28.9%	13.0%	41.9%
The Netherlands	65.6%	34.4%	100%

2.2.2 Ratio labour/materials

Due to a new selection of reference projects, the ratio between labour and material has changed as well. This ratio is determined for each project on the basis of the overall budget for this project. In these detailed estimates, the labour costs are reported separately to allow separate calculation of the factor labour (see Table 2).

Table 2: Ratio wage and material component by region and type of dwelling

	Component	
	Wages	Materials
Region North-East		
Single-family dwelling	52.5%	47.5%
Apartment	46.6%	53.4%
Region Middle South		
Single-family dwelling	49.4%	50.6%
Apartment	50.6%	49.4%
Region West		
Single-family dwelling type 1	47.7%	52.3%
Single-family dwelling type 2	54.6%	45.4%
Apartment type 1	49.7%	50.3%
Apartment type 2	58.1%	41.9%

2.2.3 *Ratio materials*

Due to a new selection of reference projects, the weighting scheme of the material component has changed completely. New materials have been added and the share of other materials has either increased or decreased. These alterations result in changed ratios between the materials relative to the reference year 2010, which in turn resulting in a new weighting scheme per product group (see Appendix). The consequences of these changes for the input price index will be discussed in the next section.

2.3 **Changes inside product groups**

Price data on the various elements of the cost component material is obtained from the statistic Producer Prices Industry (PPI). With effect from 2018, this statistic has also switched to the new reference year 2015 including a new weighting scheme.

During the base shift of the PPI, the weighting schemes of the various product groups have also been updated. As a result of these new weighting schemes based on updated data on domestic production and import of building materials, it is possible that the same product group in the series 2010=100 shows a different price trend than in the new series 2015=100.

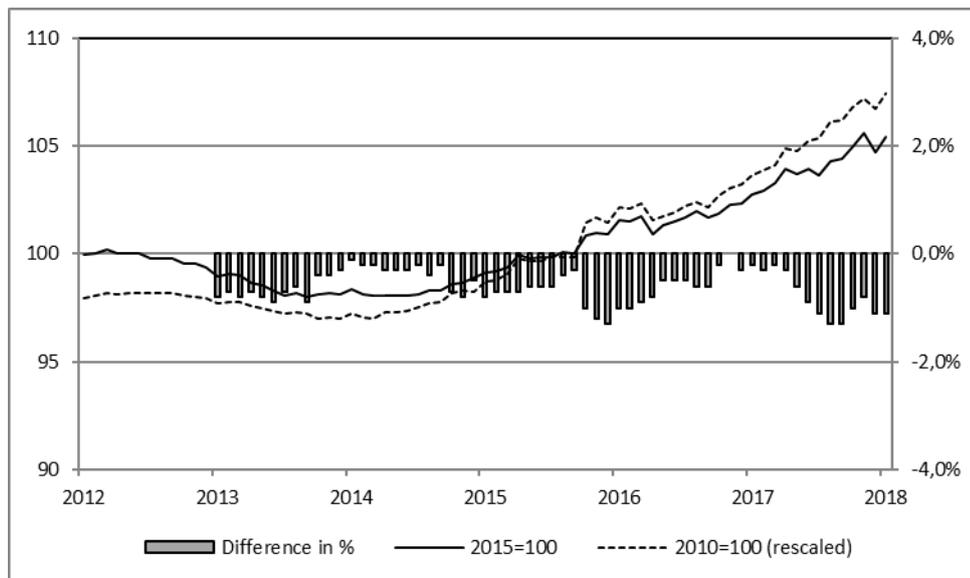
3. **Results**

The changes mentioned in Section 2 give rise to differences between the Input price index based on 2015=100 and the old reference year 2010. In this section, we explain the differences, starting with the results for the material component. Then we will look at the total input price index. The old series based on 2010=100 are all rescaled in such a way that 2015=100. No further reference is made to the wage component, as it remains unchanged (with the exception of a rescaling).

3.1 **Material component**

Figure 1 presents the price index of the material component on both the old and the new basis. It also shows the differences in terms of year-on-year percentage changes between the old and new index series.

Figure 1: Indices material component, 2010=100 and 2015=100



Rescaling of the old series 2010=100 to 2015=100 exposes the differences between both series. From 2012 to mid-2015, the y-o-y development in the old price index of the material component was up to 0.9 percentage point below that of the new series. After mid-2015, the y-o-y development in the new series remains below the old series with a difference of up to 1.3 percentage points. The diverging course of the two series has two underlying causes. Firstly, new price information that became available until 2018 was stored in the database, but no longer incorporated in the price indices. However, all available price information was included during base shifting. Secondly, during base shifting, eight new reference projects were selected. This has led to a different selection of materials with a whole new weighting scheme (see 2). This has affected the entire series.

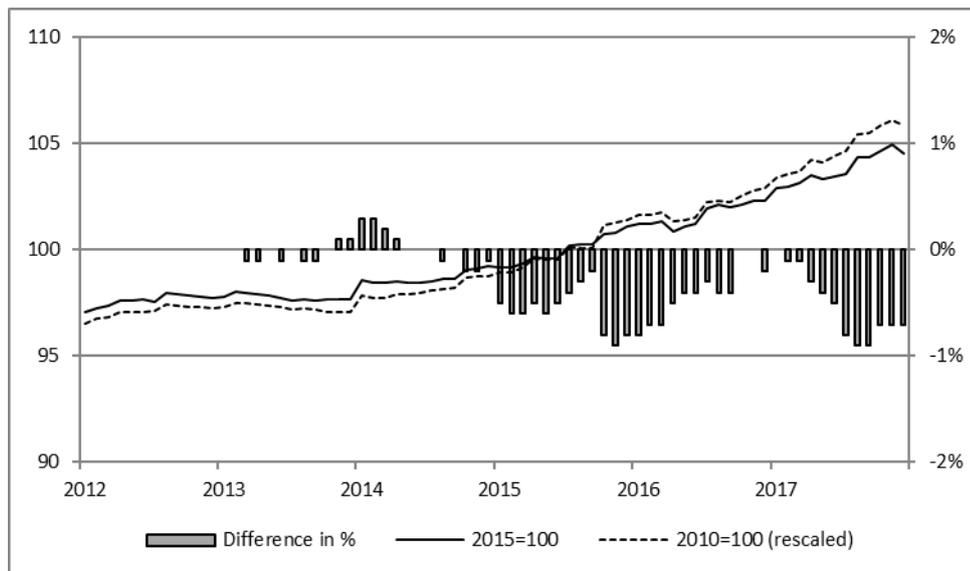
3.2 Wage component

As was the case in the old series (2010=100), the wage component in the new series 2015=100 is based on the indices of contractual wage costs (CLK). Therefore, this component remains unchanged. The series are only rescaled to 2015=100.

3.3 Total

Figure 2 shows the old and the new series of the total input price index total. Here as well, there is a divergent course in the new series compared to the old series. Because the wage component remained unchanged, the differences can be explained by the changed material indices, the adjusted weights of materials and wages in the individual reference projects as well as the new weights ratio between the individual projects. Measured over the entire period, the maximum difference in year-on-year changes between the two series is 0.9 percent, with an average of -0.2 percent.

Figure 2: Input price index Total, base 2010=100 and 2015=100



3.4 Switching from reference year 2010=100 to 2015=100

Starting from the publication date of the new figure over January 2018, the price indices of the old series 2010=100 are no longer calculated or adjusted. This series will also no longer be supplemented. For indices of subsequent periods, the new series should be used.

Users have several options when using the results of the input price index of new-build dwellings for indexation purposes. Statistics Netherlands has the following advice:

- Calculation of price changes over a period starting in or after January 2008 and ending no later than December 2016 should be based on the series 2010=100.
- Calculation of price changes over a period starting in or after January 2012 and ending after December 2016 should be based on the series 2015=100.
- Calculation of price changes over a period starting between January 2008 and January 2012 and ending after December 2016 should be based on the series 2010=100 and in December 2016 should be linked to the series 2015=100. (Linking should occur in the last definitive month of the series 2010=100, i.e. December 2016.)

Two basic assumptions underpin this advice, namely that as far as possible, price developments are calculated within one published series; and that retroactive adjustments and corrections are avoided as much as possible.

Should you have any problems or queries, please contact the Infoservice< Infoservice@cbs.nl > at Statistics Netherlands.

Appendix: weighting scheme materials, Input price indices building costs of new-build dwellings, 2015=100

Prodcom	Definition	Weights
23611200	Prefabricated structural components	22.6%
25210000	Central heating radiators and boilers	5.8%
16231110	Windows and their frames of wood	5.3%
25120000	Doors and windows of metal	5.3%
23320000	Bricks, tiles and construction products, in baked clay	5.2%
16231150	Doors and their frames and thresholds of wood	5.1%
23630000	Ready-mixed concrete	4.5%
16231900	Builders' joinery and carpentry of wood, n.e.c.	3.7%
24106210	Hot rolled concrete reinforcing bars	3.7%
24330000	Cold formed or folded products	3.3%
23640000	Mortars	3.1%
23420000	Ceramic sanitary fixtures	2.9%
25110000	Metal structures and parts of structures	2.7%
22212157	Rigid tubes, pipes and hoses of polymers of vinyl chloride	2.7%
2361X000	Sand-lime brick	2.7%
23620000	Plaster products for construction purposes	2.6%
27330000	Wiring devices	2.4%
2399X000	Non-metallic mineral products	1.8%
16210000	Veneer sheets and wood-based panels	1.6%
16100000	Wood, sawn and planed	1.5%
20301000	Paints, varnishes and similar coatings	1.2%
2223X000	Windows and their frames of plastic	1.2%
2825X000	Ventilator and heat exchanger	1.2%
28220000	Lifts	1.1%
23310000	Ceramic tiles and flags	1.1%
23611150	Products of cement, concrete or artificial stone	0.9%
20520000	Glues	0.6%
24442000	Semi-finished products of copper or copper alloys	0.6%
27400000	Electric lighting equipment	0.4%
23650000	Fibre cement	0.4%
24420000	Aluminium	0.4%
20302X00	Other paint	0.3%
263X0000	Communication equipment	0.3%
24422000	Semi-finished products of aluminium or aluminium alloys	0.3%
08121190	Construction sands	0.2%
26510000	Measuring, testing and navigating equipment	0.2%
25720000	Locks and hinges	0.2%
23700000	Cut, shaped and finished stone	0.2%
22214000	Other plates, sheets, film, foil and strip of plastics	0.1%
24107X00	Hot processed open sections of steel, sheet pilings	0.1%
23520000	Lime and plaster	0.1%
25940000	Fasteners and screw machine products	0.1%
31010000	Office and shop furniture	0.1%
23120000	Glass	0.1%
25992000	Other articles of base metal	0.1%