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Updating the 2010 Belgian Interregional Supply and Use table

Towards a version compatible with ESA 2010

A paper for the IIOA conference in Glasgow 2019

April 2019

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Abstract –

Recently, the Belgian Federal Planning Bureau has constructed interregional supply and use tables for 2010. They describe intra and interregional flows between the country's regions Brussels, Flanders and Wallonia. These tables were compiled using a bottom up approach based on VAT data and international trade data at the firm level. The tables respect the national SUT for 2010 according to ESA 95 rules (European implementation of SNA93).

The aim of this work is to adapt the interregional SUT to ESA2010/ SNA2008 rules and to the corresponding new national SUT and regional account totals for 2010. This responds to demands from users for tables compatible with more recent versions of the national or regional accounts. It will also allow for the integration of the interregional tables into recent global tables as well as for analysis for more than one year once the 2015 tables have been constructed.

Using the interregional use table at basic prices and the production tables of the three regions as a starting point, the conversion consists of a set of specific as well as automatic adjustments. The specific adjustments are asymmetric and respond to some of the major ESA revisions (including the treatment of R&D and that of goods for processing) and revisions in the Belgian national accounts (including a revision of the nace-attribution). The automatic adjustment is symmetric. It can affect all products and industries. It is set up as a recursive process. Each step consists of a series of RAS procedures by industry or final demand component for adjusting towards new regional and national totals. The problem of zero values in the interregional SUT (while not in the new national table) is also addressed.

Jel Classification - …, …
Keywords - …, …, ….

(*) My thanks go to my colleague Michel Bernhard Klaus for programming the series of RAS algorithms in Python

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1. Introduction

In 2015, the Federal Planning Bureau constructed an interregional Supply and Use Table (SUT) in basic prices for Belgium for the year 2010[1] as well as an interregional input-output (IO) table.

The interregional input-output table, an industry by industry table, is just a matrix transformation of the interregional SUT in basic prices. The interregional supply and use table for 2010 describes the intra and interregional flows of goods and services between the country's regions Brussels, Flanders and Wallonia. To estimate these flows, a bottom up approach based on VAT data and international trade data at the firm level was followed. The table respects the national SUT for 2010 according to ESA 95 rules (European implementation of SNA93). It has been used by us to calculate regional income and employment multipliers (Avonds et al., 2016), and by others to estimate the regional carbon footprint for Flanders (VITO, 2016) and the possible impact of Brexit on Belgian regions (IWEPS, 2018). It also served as an input for the Federal Planning Bureau's Belgian macro-econometric regional model (Hermreg).

In december 2015 a new national SUT and input-output table was compiled for the year 2010. These new tables were compatible with the ESA 2010/SNA 2008 rules and included other changes in the Belgian national accounts. Since then the interregional SUT and IO are no longer comparable with the last available national tables. In 2016 and 2017 new regional accounts were released in accordance with the national accounts of December 2015. These regional accounts include industry totals (of production, value added) as well as final demand components (consumption expenditure & investment) by region.

The aim of this work is to adapt the interregional SUT to ESA2010/ SNA2008 rules and the corresponding new national SUT and regional accounts. This responds to demands from users for tables compatible with more recent versions of the national accounts. It would also allow for the integration of the interregional tables into recent global tables as well as for future analysis for more than one year once the 2015 tables have been constructed.

Part 2 of the paper gives a detailed description of the update that is to be performed. Part 3 describes some of the methodological choices made. To accomplish this update first a series of specific bottom up-adjustments have been imputed. These were followed by a series of automatic adjustment procedures based on the RAS algorithm. Part 4 discusses the results.

[1] This project was carried out in cooperation with the statistical authorities of the three Regions (IBSA, SVR and IWEPS), which also provided part of the funding. It is a further step with respect to the joint project of the National Bank of Belgium and the three Regions to extend the regional accounts, which started in 2009.

2. The update to be performed

2.1. General outline

The three major sources for the update are (with publication dates between brackets):

1. the interregional Supply and Use Table (ISUT) in basic prices for 2010 (June 2015)
2. the new national Supply and Use Table (SUT) in basic prices for 2010 (December 2015)
3. the new Regional Accounts totals by industry and for final demand for 2010 (February 2016 & 2017)

The aim of the update is to compile an ISUT in basic prices for 2010 that is compatible with both the new national SUT and the new regional account totals.

To avoid redoing the cumbersome bottom up compilation for a new ISUT, it was decided to develop a methodology for updating the ISUT starting from an existing one. Once available, this method can also be used for updating the new ISUT to more recent national tables and regional accounts.

While both new constraints in point 2 and 3 are compatible with ESA2010 (SNA 2008), this does not guarantee that the newly obtained ISUT is also compatible with ESA 2010, nor is it assured that the adjustment process would be a smooth one. This issue is further discussed in part 3.

Part 2 first gives a detailed description of the update to be performed. The update can be split in a production part and a use part. The first part is the update of the production table, discussed in part 2.2. The second part is the update of the interregional use table in basic prices, discussed in part 2.3.

2.2. Updating the regional Production or Make tables

2.2.1. Why (only) updating the production tables?

A production or Make table shows the production by product and industry. The production table is only the first part of a Supply table. The latter table also contains vectors of imports, trade margins and taxes and subsidies each providing detail by product, but not by industry.

While these vectors were available in the June 2015 interregional SUT, it is not necessary to update them for deriving a new input-output table. One only needs a production table and a use table in basic prices distinguishing imports from domestic production [2].

Note that the information on imports, trade margins and taxes in a regional supply table is limited. In the case of the imports of goods for example, the presence of an import flow in a regional supply table

[2] For example, the formula for deriving a product x product input-output table based on the commodity technology assumptions is given by (Miller & Blair, 2009, p 185-196): $A_C = U\hat{x}^{-1}C^{-1}$. Here U is the use table in basic prices, x is the vector of industry output totals which is turned into a diagonalized matrix and inversed and C is the industry output proportions matrix with $C = V'\hat{x}^{-1}$. V' is the production matrix with commodities in the rows and industries in the columns. Both C and x only depend on the production matrix V'.

does not necessarily imply that that good is used in the region itself. It can be reexported to another region or country[3]. It is only when a use table of (international) imports is derived that it is clear in which region an imported good is really used.

The next three points briefly describe the sources that serve as a starting point for the update of the production table. In point 2.2.5, the update to be performed is described.

2.2.2. The (old) regional Make tables for 2010 (June 2015, ESA 95)

Table A.1 in the appendix shows the 2010 aggregated production tables for the three Belgian regions: Brussels, Flanders and Wallonia[4]. These tables were published in June 2015 and are based on national and regional accounts that follow the ESA 95 rules. The full tables contain 350 products and 140 industries.

Even with only three products (rows) and corresponding industries (columns) distinguished, the numbers show important differences in the economic activity between the three regions. The largest region (Flanders) has an important share of goods production (30.4%) and also a considerable share (20.4%) of trade and transport services, enhanced by the presence of several important international harbors. Other services represent 49.4% of production in Flanders. In contrast to this, the capital region Brussels is dominated by the other services, that represent as much as 74.1% of its total production. The economic activity of Wallonia is situated between these extremes, both in terms of its size and in terms of the economic structure.

2.2.3. The national Make for 2010

Table A.2 in the appendix shows both the old (ESA 95, June 2015) and the new (ESA 2010, December 2015) national production table in aggregated form. When compared at the high aggregation level of products and industries of table A.2, the changes in the national production table seem modest.

Yet beneath these modest changes at the aggregate level, there are significant changes at the detailed industry and product level. To demonstrate this, table A.2 shows the sum of all the differences in absolute value between the old and new make table at the detailed product and industry level (the 340x140 tables). These amount to 16.3% of the old production total of 748.9 billion euro in 2010. The degree of modification depends on the industry and product type.

Changes in the 2010 national production table are, amongst other reasons, caused by:

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[3] What matters for including a good in a country's supply table is the change of ownership. If a trader imports goods only to resale them later abroad (while realising a trade margin), the imports of the goods are included in the supply table, while the exports are included in the use table. The same principle is applied in the Belgian regional accounts and regional SUT tables. Thus, if a Flemish trader imports goods to reexport them later to one of the other regions, they will appear in the Flemish supply table as imports and in the Flemish use table as interregional exports. Once the Belgian interregional use table in basic prices has been derived though, only the trade margins realised by the Flemish trader on these goods flows remain (as a part of the Flemish make table and as a Flemish trade service used in the regions of destination). The imported goods themselves are directly destined to the region where they are used.

[4] For completeness, it also shows the production of the extra regional area, which only includes Belgian diplomatic and permanent army posts abroad. This is treated as a separate entity in the regional accounts.

– a revision of the nace-industry attribution of large firms in the Belgian national accounts register [5].
– a different treatment of international goods for processing in ESA 2010 versus ESA 95, where there is no longer a "grossing" of production, thus decreasing production[6].
– a different treatment of R&D in ESA 2010 which increases production, particularly in industries with important R&D activities.

Because these changes are often asymmetric and may impact regions differently, where additional information was available, a series of specific adjustments was performed on the original Make matrix before the automatic adjustment procedure was put into practice. These adjustments have reduced the absolute differences to 12.6% (see last part of table A.2) and will be discussed further in part 3.

2.2.4. The production totals for 2010 in the Regional Accounts

From the Belgian Regional Accounts (National Bank of Belgium) we obtained new production totals by SUT industry for 2010 according to ESA 2010 rules. These numbers are compatible with Regional Account versions published in February 2016 and 2017 [7].

Table A.3 in the appendix shows the old (June 2015) and new production totals by industry and region at the same aggregated industry level as in table A.1 and A.2. The new production totals by region sum to the amount of 751.1 billion euro, which is also the total of the new national production in table A.2. A similar equality must hold for all industries.

The national and regional accounts revision had an impact on each region's share in total production in 2010: the share of Brussels decreased from 18.7% to 18.3 %, mostly to the benefit of the share of Flanders, that rose from 60.4% to 60.7%.

2.2.5. The automatic update of the regional make tables

The update to be performed on the regional production tables is straightforward. For each industry the new national production table gives the product (row) totals, while the new regional totals give the industry (column) totals to be respected. The inner part comes from the adjusted regional production tables as given (in aggregated form) in table A.4. Since there are 140 industries, as much as 140 production tables must be adjusted.

The above describes the typical starting point of a (series of) RAS adjustment algorithms. This RAS algorithm was successfully used and is further discussed in part 3. The results are shown in table A.5. The RAS to update the regional production tables are called RAS type (or series) A to distinguish them from two different RAS-series discussed further on.

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5 This leads amongst other things to a net reduction in the production in trade industries to the benefit of other industries

6 "Grossing" refers to an increase of the production value (from that derived from a firm's turnover) to make sure it corresponds to the export value, which in the ESA 95 includes the full value of goods when exported after processing. In the ESA 2010 the export value of goods processed in a country (but owned by a non-resident firm) may only include the processing fee. Because this fee already makes part of turnover, no grossing is required. A similar grossing existed in the ESA 95 for intermediate use in its relation to the import of goods (destined) for processing.

7 Some of the modifications already present in de new (ESA 2010) national SUT for 2010 were only introduced in the regional accounts in February 2017, which is why two versions of the regional accounts are mentioned here.

2.3. Updating the interregional use table in basic prices

2.3.1. The interregional use table in basic prices for 2010 (June 2015, ESA 95)

Table A.10 in the appendix shows the aggregated interregional use table in basic prices, version June 2015 (ESA 95). It consists of 9 use tables, one for each combination of region of origin (rows) or destination (columns) as well as a use table of international imports for each region.

To keep the interregional use table readable (given the extra final domestic demand vector column for each region), the industries in table A.2 have been aggregated to two, while the distinction between three products from table A.2 has been maintained. In the full table, final domestic demand for each region distinguishes between final consumption expenditures (of households, NPISH and government), gross fixed capital formation and changes in inventories and acquisition less disposals of valuables.

The interregional use table is completed by a column for (international) exports[8]. By adding the three products, one can obtain the total exports realised by each region. The international exports realised by Brussels is e.g. 33 billion euro (=11.6+6.3+15.1). The international imports used by a region (for its intermediate and final use) can be read from the lines in the imports part. The international imports used by Brussels amount to 33.4 billion euro (=11.9+2.6+4.5+0.1+2.0+0.0+0.4+11.2+0.7).

The numbers in the intersection between the import rows and the export columns of table A.10 show re-exports. These are goods bought abroad by Belgian residents that have been resold abroad later. The huge values for re-exports of goods (68.5+5.1 [9]) are one of the distinguishing features of the Belgian (as well as the Dutch) economy. This is because Belgium due to its strategically located ports and because of being a small economy, often serves as a distribution centre for the neighbouring EU countries. These re-exports also influence the inner parts of the use table, notably by increasing the exported trade and transport services, particularly in Flanders (38.7 billion) and to a lesser extent in Brussels (6.3) and Wallonia (5.1).

The imports part in table A.10 is followed by a row for the use of taxes less subsidies on products and one for value added[10]. Value added consists of compensation of employees, other taxes on production, other subsidies on production, operating surplus and mixed income (net) and consumption of fixed capital. All these variables must also be readjusted to new national and regional totals according to ESA 2010.

2.3.2. The national use table in basic prices for 2010

Table A.6 in the appendix shows both the old (ESA 95, June 2015) and the new (ESA 2010, December 2015) national use table in basic prices in aggregated form. The use tables are supplemented with a table that gives the sums of the differences in absolute values between the (full) old and new use table in the situation before and after specific adjustments (discussed in part 3).

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8 In the full table, a distinction is made between the export of goods and the export of services.

9 It may seem contradictory to also find re-exports among other services, but this is due to the CPA-classification, which places books, newspapers, CDs, DVDs, movies in their physical form under the CPAs 58 and 59.

10 At the detailed level, a distinction is made between value added tax (vat) and other taxes less subsidies on products (e.g. excise taxes).

In table A.6, the number of industries is reduced to two and supplemented with final domestic demand and exports as destinations.

Throughout table A.6, a distinction is made between the use of domestic production and that of imports. This distinction effectively doubles the number of products and cells in the use table with respect to the production table. It should therefore not surprise that the sum of absolute differences between the new and old use table is, with 26.3% of the old use total, higher than in the production table (16.3%).

While for the primary and manufacturing industries, the ratio of absolute changes with respect to the old values was 20% in table A.2, it now rises to 35% in table A.6. For both services industries in table A.2, the ratio of absolute changes was only about 14-15%, now it amounts to 39%. This high percentage of changes in the services industries is mostly due to the use of "other services" both domestic and imported, where both the new ESA rules and some revisions in the Belgian national accounts have had a large impact.

The sum of the absolute changes in final domestic demand and in exports are resp. 18% and 19% of the original use values. While these percentages are lower than those for the intermediate use, they are still higher than those for production.

Table A.7 shows the use of the primary inputs in the national table. The primary inputs consist of the taxes less subsidies on products and the components of value added. Table A.7 gives the old and new values as well as the absolute differences between them at the detailed level. While the total value for taxes less subsidies has only increased with 0.3 billion euro, the value added has increased by 9 billion euro in the new national accounts for 2010 [11]. This increase is partly caused by the new treatment of self-produced and purchased R&D in the ESA 2010 rules[12].

2.3.3. The regional totals for intermediate use, domestic final demand and value added

From the Belgian Regional Accounts (National Bank of Belgium) versions published in February 2016 and 2017 [13], we obtained, for each region, besides new production totals by industry (already shown in table A.3):

- New intermediate use totals by industry in purchaser prices including vat
- New value-added totals by industry
- New final consumption expenditures of households, NPISH and government in purchaser prices including VAT
- New Gross fixed capital formation in purchaser prices including VAT

[11] Together, these changes imply a GDP increase of 9.3 billion euro.

[12] In ESA 2010 self-produced R&D is considered as a production that increases both the capital stock and value added (by about 5.3 billion euro in 2010) while purchased R&D is considered as a purchase for investment and no longer as intermediate use. It thus no longer reduces value added, causing a further increase of about 1.2 billion euro in 2010.

[13] Some of the modifications already present in de new (ESA 2010) national SUT for 2010 were only introduced in the regional accounts in February 2017, which is why two versions of the regional accounts are mentioned here.

These data were the basis for the new regional constraints for domestic final demand and for intermediate demand and value added by industry. Still, some calculations had to be performed before obtaining the new totals in basic prices:

- VAT & other product related taxes had to be first regionalised and then subtracted from intermediate demand by industry and from final demand to obtain regional totals in basic prices.
- Changes in inventories had to be regionalised to complete domestic final demand

Tables A.8 and A.9 in the appendix give the old and new regional totals for intermediate use, domestic final demand and value added.

In the new version of the regional accounts for 2010, intermediate use is lower than in the old version, while domestic demand has increased. This shift is partially due to the new treatment of R&D in the ESA 2010 rules. The 9 billion increase in value added already shown in the national table A.7 has specifically benefitted the Flemish region, which saw its share in domestic use increase from 57.2% to 57.5%.

Note that table A.8 does not include exports. In fact, the regional accounts (NBB) do produce exports by industry and region with a distinction between goods and services. These cannot be used in this exercise though, because of a difference in the meaning of goods exports with our interregional use table[14]. In the regional accounts, the export of goods by a region include all its exports, even if the goods are first produced in one of the other regions.

In the interregional use table, a region's export values of goods can only include its own production or international imports. If a trader from another region comes in between the producer and the export of the good, the trader may acquire a trade margin (which will be attributed to his region), but the basic value of the exported goods will be attributed to the region of production.

2.3.4. The automatic update of the interregional use table in basic prices

The table that needs to be updated to new regional and national totals is table A.10: the interregional use table in basic prices. The regional constraints are:

- totals of intermediate use in basic prices and of value added for each industry
- total use in basic prices for each component of final domestic demand
- total production of each product in each region

The national constraints are:

- the national use table in basic prices with a distinction between the use of domestic production and that of imports
- the components of value added per industry

[14] Because this difference in meaning does not exist for the export of services, these data could have been used as constraints for the new interregional use table. While the survey data behind the Regional Accounts industry totals were used to perform a series of specific adjustments on exported services (see section 3), using the industry totals on exported services as constraints, was not desirable, because of some conflicts with the national make table. A service that is exported by an industry, must also be produced by that industry: and that was not always guaranteed by the make table for 2010.

Given that there are separate regional constraints for the intermediate use and for value added per industry, the updates of both parts of table A.10 were done separately.

The update of the value-added table was based on specific data and did not involve an automatic adjustment algorithm. It will only be discussed (briefly) in this section.

In the national accounts, value added is broken up into 5 components. Table 1 below directly gives the results for a breakdown in three components: compensation of employees, other taxes less subsidies on production and gross operating surplus plus mixed income. Little (extra) effort had to be done to obtain these results: the regional split by industry for the compensation of employees was obtained from the 2018 version of the FPB Labour Accounts. The other taxes and subsidies on production and the gross operating surplus plus mixed income were only available at the national SUT industry level. There was some regional information on other (i.e. not product-related) subsidies and the consumption of fixed capital. After putting in this information, the remaining values were spread proportionally over the regions according to total value added for each region by industry.

Table 1 The update for the components of value added, results per region, 2010 (ESA 2010)
Billions of euro

Component of VA \ region:	Brussels	Flanders	Wallonia	Total	Source of regionalisation
Compensation of employees	35.7	102.9	44.4	183.0	FPB Labour Accounts for 2010 (ESA 2010)
Other taxes less subsidies on production	-0.1	-2.4	-1.3	-3.7	National data at SUT-industry level + regional data on wage & other subsidies for aggregated industries
Gross operating surplus and mixed income (*)	24.9	87.2	34.9	147.0	National data at SUT-industry level + specific regional corrections for consumption of fixed capital (R&D)
Total (value added)	60.5	187.8	78.0	326.3	Regional Accounts 2016-2017 (NBB)

SOURCE: Federal Planning Bureau.
(*) Including the consumption of fixed capital

The updating of intermediate and final use of the interregional use table (the upper part of table A.10), with 350 products, 140 industries and 8 final demand components, is a more elaborate process.

Here, we describe the automatic adjustment procedure used for this part of the interregional use table, knowing that it is preceded by a specific adjustment process discussed in part 3.

The automatic adjustment procedure consists of two consecutive series of RAS algorithms. These reflect the two regional dimensions present in table A.10: a region of origin (rows) and one of destination (columns).

The first series of RAS algorithms concentrates on the region of destination. It leaves out the information on the region of production but maintains the distinction between domestic production and imports. These RAS are called RAS type B. Table 2 below illustrates the starting point of a RAS type B for the primary and manufacturing industries[15]. There is a separate RAS type B for each of the 140 industries

[15] Since the primary and manufacturing industries are an aggregation of industries, the numbers in table 2 are not really the starting point for a RAS, but an aggregation of the start RAS B for all goods producing industries.

and for the 6 components of domestic final demand[16]. The inner part of table 2 can be derived from table A.11, which is the interregional use table after specific adjustments (see part 3).

For example, the use of domestically produced goods of 4 billion euro by the primary and manufacturing industries in Brussels equals 2.3 + 1.4 + 0.3 (found in the first column of table A.11). The constrains by product come from the new national use table in basic prices (second part, first column of table A.6), those by industry from the new regional totals (second part, first column of table A.8).

Table 2 Determining the region of destination by industry or domestic final demand component (RAS series B)
Billions of euro, primary and manufacturing industries

Origin	Products	Brussels	Flanders	Wallonia	Total	National totals (from table A.6)
Domestic production	Goods	4.0	26.8	7.1	37.9	38.9
	Trade & transport services	0.9	11.3	3.3	15.5	15.2
	Other services	1.4	15.2	6.0	22.6	23.4
Imports	Goods	9.9	52.8	11.6	74.2	68.1
	Trade & transport services	0.1	2.1	0.5	2.7	3.4
	Other services	0.5	5.5	2.7	8.7	8.2
Total		16.7	113.6	31.2	161.6	157.1
Regional Total (second part, first column of table A.8)		16.8	110.8	29.5	157.1	

SOURCE: Federal Planning Bureau.

Once all RAS B are terminated successfully, we dispose of an update of table 2 for each industry. The imports part of that table is already a definitive result. It respects the national use table of imports and, together with the use table of domestic production, also respects the use in basic prices of each region for each industry.

What is not determined yet is the region of origin of the use of each domestically produced product. That will be determined by a series of RAS algorithms for each product, called RAS series C. The inner part of a RAS type C can be obtained by using the full detail of table A.12. The constraints are, for the RAS for product i:

– the use of domestic production of product i by each industry in each region (from RAS B) plus national exports in basic prices
– the total production of product i by each region as yielded by RAS series A (see table A.5).

Table 3 below illustrates the starting point for a RAS type C for the production of goods. The regions of origin are placed in the columns and the regions of destination in the rows.

[16] Consumption expenditures are split in 4 components: households, NPISH, government market and non-market; then there is fixed capital formation and inventory changes.

Table 3 **Determining the region of origin by product (RAS series C)**
Billions of euro, numbers for goods

Destination	Industries \ region of origin:	Brussels	Flanders	Wallonia	Total	Total use (RAS B & exports)
Brussels	Primary and manufacturing ind.	2.3	1.4	0.3	4.0	4.3
	Services industries	0.6	1.5	0.5	2.6	2.5
	Final domestic demand	0.8	1.0	0.2	2.0	1.9
Flanders	Primary and manufacturing ind.	1.0	23.1	2.7	26.8	27.4
	Services-industries	0.6	13.4	1.3	15.3	14.1
	Final domestic demand	1.0	11.6	1.1	13.7	13.0
Wallonia	Primary and manufacturing ind.	0.2	2.3	4.6	7.1	7.2
	Services-industries	0.3	1.6	3.6	5.5	5.2
	Final domestic demand	1.4	3.3	4.5	9.3	9.2
Exports		9.5	81.8	21.8	113.0	113.1
Total		17.7	141.1	40.6	199.3	197.8
Constraint: regional production totals (from RAS A)		17.8	140.1	39.9	197.8	

SOURCE: Federal Planning Bureau.

There is one RAS for each of the 350 products. Each of these RAS algorithms takes the use of every combination of industry (or final demand component) and region of destination from the RAS series B results as a constraint. The RAS B results are supplemented with the exports of domestic production (for the product concerned) taken from the national use table[17]. The column totals in RAS series C must respect the total production by each region of the concerned product. This is obtained from RAS A.

As can be verified in table 3, the sum of all column total constraints equals the sum of all row total constraints. This must be the case, otherwise the RAS could not converge.

2.4. Summary of the automatic updating process.

Table 4 below summarises the complete automatic updating process for the regional make tables and the interregional use table in basic prices.

Table 4 **The automatic updating process for the Make and Use tables in three steps**
Billions of euro

RAS series	Description by function	One RAS for each:	Number of RAS	Uses results of
A	RAS updates of the regional production tables	Industry	140	-
B	RAS updates of the use table by region of destination (distinguishing domestic production & imports)	Industry and domestic final demand component	146 (*)	-
C	RAS update of the use table by region of production	Product	340	RAS A and B

SOURCE: Federal Planning Bureau.
(*) There are 140 industries and 6 domestic final demand components. Exports are not included in RAS B.

[17] Exports only come in at this stage, because it does not make sense to differentiate Belgian exports by Belgian region of destination, which is what one would do in the context of RAS type B.

3. Specific versus automatic adjustments

3.1. Specific adjustments

3.1.1. The need for specific adjustments

The updated regional make tables and interregional use table in basic prices fully respect the new ESA 2010 national table for 2010 as well as the new regional account totals that are also compatible with the new ESA. Does this imply that the update, that starts from tables in ESA 95, generates tables that are compatible with ESA 2010? This is a principal question that cannot be answered easily.

Since the new national table is respected, what the update does is regionalising each cell in the new national table. Changes in the national table that affect all regions proportionally, would not invalidate taking the old regional SUT as a starting point. Large modifications that have a disproportional effect on certain regions would influence new regional totals (e.g. of production or use by industry) so that the automatic adjustment process would even take this asymmetry into account.

However, for any change that affects a specific product in a specific industry (or final demand component) in a certain region, an automatic adjustment process would still unduly spread a part of it towards other products and/or industries in other regions. This may become really problematic if multiple large changes occur at the same moment. In that case e.g. regional totals may not respond to a change that reduces production, because there is an offsetting change of similar size in a different product.

A practical answer one can give to this possibility is the following. If one has detailed information on specific modifications, it is better to adjust the inner part of the make and use table to it before the automatic adjustment is started. We call this "making specific adjustments".

Besides the justification outlined above, there are also practical reasons to make specific adjustments. One such a reason has to do with zero values. If the modification of the national tables implies that positive values become zeros, this poses no problems for an automatic adjustment process like RAS. The inverse shift on the other hand is not possible: zero values in the original (national) table with positive ones in the new table cannot be treated with RAS.

The following ESA 2010 modifications have caused a shift from zero to positives in numerous cases:

– Use table: the new ESA rules on goods sent abroad for processing have led to a shift from exports of goods to the exports of (industrial) services[18]. In the Belgian numbers for 2010, this led to the appearance of (up to 4 billion euro) exported services in products where the old (ESA 95) use table mostly had zeros (Van den Cruyce, 2016).

[18] The relevant case for the use table is that of inwards processing. In ESA 2010 the export value of goods that are processed in Belgium (while owned by a non-resident firm) is no longer recorded as an export of goods. What remains is the value of the processing fee, which is now considered as the export of a service. In ESA 95 the full value of the exported goods was treated as exports of goods. The difference with the processing fee was met by the treatment of "grossing", thereby also increasing production to maintain the equilibrium in the SUT.

– Make table: self-produced R&D is treated as a production in ESA 2010, whereas in the old ESA 95 it was treated as an auxiliary activity. The product concerned (cpa 72) only had positive values in the case R&D was sold to third parties in the old make table, in the new table almost all industries have self-produced R&D.

The occasional revision of the Belgian national accounts has led to similar shifts:

– Make table: 5 SUT-products had (incorrect) zero production in the old make table for 2010 and a positive production in the new version[19].

– Use table: 5 SUT-products had zero values in the old SUT and positive import values in the new[20]

– Punctual improvements in the production or use data for specific industries (e.g. agriculture) have led to positive values replacing zeros

– The revision of the Nace attribution in the Belgian national accounts register has led to the replacement of zeros by positive values as well as the opposite: the replacement of positive values by zeros.

In all cases where zero values are replaced by positive ones, specific adjustments based on additional/individual information are desirable.

An additional reason for specific adjustments is that the modifications in ESA and the national accounts typically also have different effects across the regions. For example, the 4 billion euro shift from export of goods to export of services in the case of processing was regionally spread as 0.1 billion for Brussels, 2.8 for Flanders and 1.1 for Wallonia. This is less than proportional for Brussels. The revision of the Nace-industry attribution between the two versions of the national 2010 tables has also led to asymmetric changes in the matrices of production and intermediate consumption.

To see this, assume that a large firm shifts from industry i to industry j in region A. There are no similar shifts from i to j in the other regions. The shift results in new (smaller) industry totals of production and intermediate consumption in industry i and larger ones in industry j in region A. Thus far, this shift does not seem to disturb the adjustment process too much. The new regional totals correctly reflect the shift in the production and intermediate use from industry i to j.

Yet both the production and the input *vectors* of the (large) firm that was shifted away from industry i are unlikely to be average for the national industry i. They are more likely to resemble those of industry j or something in between both industries. Since it is a large firm, its data have been used in industry i in the old SUT and in industry j in the new SUT. A standard RAS procedure does not use this information and is therefore likely to attribute a fraction of the production/intermediate use shift to the wrong products, industries or regions.

[19] These were clothing of leather and fur (14A01), manufacturing of music instruments (32B01), repair of other equipment (33A08), market education (85A03) and prostitution (96A05).

[20] These were textile processing services (13A03), forming services of metal, powder metallurgy (25A06), repair and maintenance of motor vehicles and parts (45A01), services of holdings, trusts, funds and similar financial entities (64A02) and prostitution (96A05).

3.1.2. The impact of specific adjustments

Specific adjustments have been carried out for the ESA 2010 modifications related to goods for processing (affecting mainly regional export values[21]) and the treatment of R&D. The latter affected production, intermediate demand and gross capital stock formation of the R&D product (cpa 72))[22] as well as value added for the industries with self-produced and purchased R&D.

Another series of special adjustments have been carried out to neutralise the impact of the revision of the nace-attribution for a number of especially large firms[23]. Finally, some adjustments were made based on available regionalised information on certain other revisions in national accounts[24].

Table A.4 shows the regional make tables after all the specific adjustments. The new row and column totals still do not correspond to the constraints. Yet in table A.2 one can verify that the sums of absolute differences with the national table have been reduced globally from 16.3% to 12.6%.

Table A.11 shows the interregional use table in basic prices after specific adjustments. The impact these adjustments have had on the sum of absolute differences with the new national use table is shown below in table A.6. Compared with the situation without specific adjustments, the differences have dropped from 26.3% of total use in basic prices to 14%. The reduction of absolute differences was most impressive for exports (from 19% to only 1.4%), followed by domestic final demand (from 18% to 7%).

3.2. The automatic adjustments in practice

The automatic adjustment of the make table and that of the interregional use table involved a series of RAS adjustment algorithms. The different series of RAS (A, B and C) and their sequence have been set forth in section 2.

For the execution of the RAS algorithms, a programmed solution in a python environment was developed. This program did not only execute the RAS algorithms, but also took care of some remaining obstacles to convergence. This includes the zero values issue, which could not be completely solved with specific adjustments.

Table 5 below reports the remaining zero-values after specific adjustments. For each RAS series, the table gives the number of cases and the total value in billions of euro in the new or old table that corresponds with the situation. A difference is made between the situation where there is a zero in the new table but not in the original one and that where there was a zero in the old table and not in the new table. The first situation poses no problem for the RAS, therefore no additional adjustment was done.

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21 i.e. replacing the export of goods by the export of services, since the processing fee is treated as a service since ESA 2010.

22 We are grateful to the Regional Accounts (NBB) for providing us unpublished data on the regional distribution by industry on the effects of the new treatment of R&D on production, intermediate use and value added.

23 In the make tables, specific adjustments (mainly to nace revisions) were carried out until all cells with initial production zero (or close to zero) and new production greater than 50 million euro were eliminated. In the interregional use table, this process was stopped once all differences between the old and new (national) numbers were below 350 million euro in absolute value.

24 There was a revision in the production and intermediate use for agriculture by region, there were improvements in the import and export values of good and services by product as well as in consumption expenditures for households, NPISH and government.

The second situation makes it impossible for the RAS to converge. In that situation each zero regional cell received beginning values proportional to the regional share in total industry production or use.

Table 5 The zero-values problem per RAS series

Situation	Frequency and value	RAS A (R. production)	RAS B (R. destination for domestic & imports)	RAS C (R. origin if domestic)
Non zero in old table, zero in new table	Number of cases	639	3680	2690
	Value of this type (billion €)	8.0	5.3	2.6
Zero in old table, non zero in new table	Number of cases	464	2362	3257
	Value of this type (billion €)	2.5	4.0	2.4
Cells with non-zero values in new national (make/use) table		2663	30186	16746

SOURCE: Federal Planning Bureau.

For comparison, the last row in table 5 gives the number of positive cells in the new national make table (RAS A), the new domestic + imported use table (RAS B) and the new use table of domestic production (RAS C). In the case of RAS A, the number of cells with zero in the old table of 464 (or 17.4%) seems high with respect to the total of 2 663 cells with positive values in the new make table. Yet the total value of these cells in the new table only amounts to 2.5 billion euro. This is relatively small compared to the total production of 751.1 billion euro (see tables A.2 or A.3).

For RAS series B and C, the number of cases with zero in the old to non-zero values in the new table is with resp. 2362 and 3257 much higher. Yet the number of non-zero cells in their corresponding national tables is also higher. In RAS C 19.5% of the cells with positive values in the new table have zero values in the old national table. Luckily, the total value of these cells only amounts to 2.4 billion euro, which is 0.3% of the total production of 751.1 billion euro.

Table 5 learns that the number of cases with zero value in the new table and non-zero values in the old table always exceeds the opposite situation (with zero values in the old and non-zero in the new). The amounts involved are also more important, particularly in the case of the production table, where 8 billion euro in the old table becomes zero in the new one. This higher frequency has two causes:

– The nace-correction in the national accounts register has reduced secondary production in the make table by putting wrongly allocated firms in their correct industry[25].

– Many specific adjustments (including those for R&D, exports of services, new products…) were set up to address situations with zero values in the old and non-zeros in the new table.

Besides the zero values problem, there was also a negatives problem. Negatives appeared in the case of changes in inventories (inventory decreases). At the aggregation level of the tables here, this problem is not visible. Despite the availability in the literature of more elaborate solutions for updating with

[25] While the special adjustments to the make table often implied reallocating the bulk of the production of large firms with a nace change towards their new industries, a small fraction of the production was sometimes left in the old industry. Because the new national make table was derived bottom up starting from the new register, no such traces were found in this table.

negatives[26], this issue was treated by withdrawing the inventory changes from the automatic adjustments after making sure (with a specific adjustment) that the national totals were respected[27].

[26] See e.g. Junius & Oosterhaven (2003) for the development of the GRAS algorithm, a generalized RAS procedure that can deal with the negatives problem.

[27] The reasons for not putting more effort in this issue arise from the poor quality of the Belgian national SUT data on inventory changes at the product level as well as their absence in the Belgian regional accounts.

4. Final results

Table A.5 in the appendix shows the three regional make tables in ESA 2010.

Table A.12 in the appendix shows the adjusted use table in basic prices for 2010 in ESA 2010. The regional and industry/product totals in this table respect both the national use table in basic prices (with distinction between domestic production and imports) and the regional totals for intermediate use and production by industry, as well as for final demand.

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Appendix

Table A.1 Old aggregated production table by region in ESA 95 (June 2015)
Billions of euro

Region	Product (*) \ industry:	Primary & manufacturing ind.	Trade & transport industries	Other services	Total	% by region
Brussels	Goods	17.8	0.4	0.5	18.6	13.3%
	Trade & transport services	0.8	16.1	0.7	17.6	12.6%
	Other services	0.5	3.3	99.9	103.6	74.1%
Flanders	Goods	131.4	4.2	2.1	137.6	30.4%
	Trade & transport services	7.0	83.0	1.4	91.4	20.2%
	Other services	6.4	3.5	213.5	223.3	49.4%
Wallonia	Goods	38.4	0.6	0.7	39.8	25.4%
	Trade & transport services	1.5	22.1	0.4	24.1	15.4%
	Other services	3.0	1.2	88.4	92.6	59.2%
Extraregional area	Other services	0.0	0.0	0.3	0.3	100%
Total (Belgium)		206.8	134.3	407.9	748.9	

SOURCE: Federal Planning Bureau (Interregional input-output table, June 2015)

(*) Goods include all products of agriculture, fishery other primary products and manufactured goods (cpa 01-32). Trade and transport activities also include repair of motor vehicles and warehousing & support activities for transportation as well as postal and courier activities (cpa 45-53). Other services include repair and installation of machinery and equipment (cpa 33), utilities (Electricity, gas, water, waste: cpa 35-38), construction (cpa 43-45) and all other services (cpa 55-97).

Table A.2 Old (ESA 95) & new (ESA 2010) aggregated national production table and differences in absolute value before and after specific adjustments
Billions of euro

Version	Product (*) \ industry:	Primary & manufacturing ind.	Trade & transport industries	Other services	Total	% by product
Old production table (ESA 95)	Goods	187.6	5.2	3.3	196.0	26%
	Trade & transport services	9.3	121.2	2.5	133.1	18%
	Other services	9.9	7.9	402.1	419.8	56%
	Total	206.8	134.3	407.9	748.9	
New production table (ESA 2010)	Goods	188.7	5.4	3.7	197.8	26%
	Trade & transport services	8.4	119.8	1.7	129.9	17%
	Other services	10.9	7.0	405.4	423.3	56%
	Total	208.1	132.2	410.8	751.1	
Sum of diff. in absolute value before specific adjustments	Goods	30.8	3.0	2.3	36.1	30%
	Trade & transport services	3.4	10.7	1.6	15.7	13%
	Other services	7.8	4.6	58.0	70.4	58%
	Total	42.0	18.3	61.9	122.2	
Sum of absolute diff. / old make table (%)		20.3%	13.6%	15.2%	16.3%	
Sum of diff. in absolute value after specific adjustments	Goods	26.1	2.4	1.8	30.3	32%
	Trade & transport services	2.7	8.0	1.6	12.2	13%
	Other services	3.8	2.6	45.5	51.9	55%
	Total	32.6	13.0	48.9	94.4	
Sum of absolute diff. / old make table (%)		15.7%	9.7%	12.0%	12.6%	

SOURCE: Federal Planning Bureau (input-output tables 2013 and 2015)

(*) The same products as in table A.1.

Table A.3 Old and new regional production totals
Billions of euro

Version	Regions \ industry:	Primary & manufacturing ind.	Trade & transport industries	Other services	Total	% by region
Old regional account totals (ESA 95)	Brussels	19.1	19.7	101.0	139.8	18.7%
	Flanders	144.7	90.7	217.0	452.4	60.4%
	Wallonia	43.0	23.9	89.6	156.5	20.9%
	Extraregional area	0.0	0.0	0.3	0.3	0.0%
Total Belgium (ESA 95)		206.8	134.3	407.9	748.9	
New regional account totals (ESA 2010)	Brussels	18.7	18.8	100.0	137.6	18.3%
	Flanders	146.3	89.4	219.9	455.6	60.7%
	Wallonia	43.1	24.0	90.6	157.6	21.0%
	Extraregional area	0.0	0.0	0.3	0.3	0.0%
Total Belgium (ESA 2010)		208.1	132.2	410.8	751.1	

SOURCE: Regional Accounts (National Bank of Belgium, 2015 and 2016-2017)

Table A.4 Aggregated production table by region after specific adjustments (before RAS A)
Billions of euro

Region	Product (*) \ industry:	Primary & manufacturing ind.	Trade & transport industries	Other services	Total	% by region
Brussels	Goods	17.7	0.4	0.4	18.5	13.1%
	Trade & transport services	1.0	16.0	0.9	17.9	12.6%
	Other services	0.9	1.9	102.1	104.9	74.3%
Flanders	Goods	131.5	4.4	2.4	138.3	30.3%
	Trade & transport services	6.7	81.7	1.6	89.9	19.7%
	Other services	8.0	3.7	216.3	228.1	50.0%
Wallonia	Goods	38.2	0.6	0.7	39.5	25.0%
	Trade & transport services	1.4	22.1	0.5	24.1	15.3%
	Other services	3.9	1.2	89.2	94.3	59.7%
Extraregional area	Other services	0.0	0.0	0.3	0.3	100.0%
Total (Belgium)		209.4	131.9	414.4	755.7	

SOURCE: Federal Planning Bureau

Table A.5 Aggregated production table by region for 2010 in ESA 2010 (final result)
Billions of euro

Region	Product (*) \ industry:	Primary & manufacturing ind.	Trade & transport industries	Other services	Total	% by region
Brussels	Goods	17.0	0.4	0.4	17.8	12.9%
	Trade & transport services	1.0	16.3	0.3	17.6	12.8%
	Other services	0.8	2.1	99.3	102.2	74.3%
Flanders	Goods	133.2	4.3	2.5	140.1	30.8%
	Trade & transport services	6.1	81.4	1.0	88.5	19.4%
	Other services	6.9	3.7	216.3	227.0	49.8%
Wallonia	Goods	38.5	0.6	0.8	39.9	25.3%
	Trade & transport services	1.4	22.1	0.4	23.8	15.1%
	Other services	3.2	1.2	89.5	93.9	59.6%
Extraregional area	Other services	0.0	0.0	0.3	0.3	100%
Total (Belgium)		208.1	132.2	410.8	751.1	

SOURCE: Federal Planning Bureau

Table A.6 Old (ESA 95) & new (ESA 2010) aggregated national use table in basic prices (*) and differences in absolute value before and after specific adjustments
Billions of euro

Version & origin	Product \ industry:	Primary & manufacturing ind.	Trade, transport & services	Domestic final demand (**)	Exports	Total
Old use of domestic production (ESA 95)	Goods	35.9	23.4	25.4	111.3	195.9
	Trade & transport services	11.3	28.3	43.3	50.1	133.1
	Other services	22.1	150.2	205.4	41.8	419.4
Old use of imports (ESA 95)	Goods	77.7	18.2	37.5	68.5	201.9
	Trade & transport services	2.7	15.2	0.6	0.0	18.5
	Other services	10.1	27.4	3.3	5.1	45.9
Old national use total		159.7	262.8	315.5	276.8	1014.7
New use of domestic production (ESA 2010)	Goods	38.9	21.8	24.1	113.1	197.8
	Trade & transport services	15.2	28.0	46.8	39.9	129.9
	Other services	23.4	143.3	212.8	43.5	423.0
New use of Imports (ESA 2010)	Goods	68.1	16.6	36.5	71.0	192.1
	Trade & transport services	3.4	16.4	0.3	0.0	20.1
	Other services	8.2	31.7	5.9	4.7	50.5
New national use total		157.1	257.8	326.3	272.2	1013.4
Sum of absolute differences before specific adjustments: domestic production	Goods	14.3	8.1	8.6	19.3	50.3
	Trade & transport services	6.1	5.7	5.4	14.3	31.4
	Other services	9.3	55.1	29.9	7.6	101.9
Sum of absolute differences before specific adjustments: imports	Goods	19.5	8.1	7.4	12.0	47.0
	Trade & transport services	1.3	3.1	0.2	0.0	4.6
	Other services	5.4	22.1	4.0	0.5	32.0
Total of absolute differences before specific adjustments		55.9	102.2	55.6	53.6	267.3
Sum of differences / old use table (%)		35.0%	38.9%	17.6%	19.4%	26.3%
Sum of absolute differences after specific adjustments: domestic production	Goods	11.2	7.0	5.7	0.0	23.9
	Trade & transport services	1.2	2.8	0.5	0.6	5.2
	Other services	7.8	38.8	9.4	3.3	59.3
Sum of absolute differences after specific adjustments: imports	Goods	15.1	7.8	4.7	0.0	27.7
	Trade & transport services	1.3	3.1	0.2	0.0	4.6
	Other services	3.8	16.5	1.5	0.0	21.9
Total of absolute differences after specific adjustments		40.4	76.1	22.1	3.9	142.6
Sum of differences / old use table (%)		25.3%	28.9%	7%	1.4%	14.0%

SOURCE: Federal Planning Bureau (input-output tables, 2013 and 2015)

(*) excluding the extra regional area

(**) Domestic final demand consists of consumption expenditures by households, NPISH and government, gross capital stock formation and changes in inventories. Changes in inventories have been regionalised at the FPB respecting national totals.

Table A.7 Old (ESA 95) & new (ESA 2010) national primary inputs and changes in absolute value (*)
Billions of euro

version	Input type:	Primary & manufacturing ind.	Trade, transport & services	Domestic final demand	Exports	Total
Old primary inputs (ESA 95)	Taxes less subsidies on products	1.3	7.6	29.2	0.2	38.2
	Value-added	45.8	271.5	-	-	317.3
New primary inputs (ESA 2010)	Taxes less subsidies on products	1.2	8.4	28.7	0.3	38.5
	Value-added	49.8	276.5	-	-	326.3
Sum of changes in absolute value	Taxes less subsidies on products	0.2	3.3	1.6	0.3	5.4
	Value-added	10.7	42.2	-	-	53.0
Sum of changes / old primary inputs (%)	Taxes less subsidies on products	19%	44%	5%	120%	14%
	Value-added	23%	16%	-	-	17%

SOURCE: Value added: National Accounts (National Bank of Belgium 2013 and 2015), Taxes less subsidies by industry: Federal Planning Bureau (input output tables 2013 and 2015)

(*) Excluding the value added in the extra regional area

Table A.8 Old and new regional totals for intermediate use and domestic final demand in basic prices
Billions of euro

Version	Region \ industry:	Intermediate use Primary & manufacturing ind.	Intermediate use Trade, transport & services	Domestic final demand (*)	Total	% by region
Old regional account totals (ESA 95)	Brussels	17.1	60.6	35.9	113.6	15.4%
	Flanders	112.0	153.8	186.8	452.5	61.3%
	Wallonia	30.6	48.4	92.8	171.8	23.3%
	Extraregional area	0.0	0.1	0.1	0.2	0.0%
Total Belgium (ESA 95)		159.7	262.9	315.6	738.2	
New regional account totals (ESA 2010)	Brussels	16.8	58.0	36.9	111.8	15.1%
	Flanders	110.8	151.7	193.2	455.7	61.4%
	Wallonia	29.5	48.0	96.5	174.0	23.5%
	Extraregional area	0.0	0.1	0.1	0.2	0.0%
Total Belgium (ESA 2010)		157.1	257.8	326.7	741.6	

SOURCE: Regional Accounts (National Bank of Belgium, 2015 and 2016-2017) plus own transformation to basic prices.

Table A.9 Old and new regional totals for value added
Billions of euro

Version	Region \ industry:	Primary & manufacturing ind.	Trade, transport & services	Total	% by region
Old regional account totals (ESA 95)	Brussels	1.9	58.3	60.2	19.0%
	Flanders	31.8	149.8	181.6	57.2%
	Wallonia	12.1	63.3	75.4	23.8%
	Extraregional area	0.0	0.2	0.2	0.1%
Total Belgium (ESA 95)		45.8	271.7	317.5	
New regional account totals (ESA 2010)	Brussels	1.8	58.7	60.5	18.5%
	Flanders	34.6	153.1	187.8	57.5%
	Wallonia	13.3	64.7	78.0	23.9%
	Extraregional area	0.0	0.2	0.2	0.0%
Total Belgium (ESA 2010)		49.8	276.7	326.5	

SOURCE: Regional Accounts (National Bank of Belgium, 2015 and 2016-2017)

APPENDIX

Table A.10 **Belgian Interregional Use Table in basic prices for 2010 (ESA 95) (*)**
Billions of euro

Origin	Product	Brussels Intermediate use by primary & manufacturing ind.	Brussels Intermediate use by construction & services ind.	Brussels Final demand	Flanders Intermediate use by primary & manufacturing ind.	Flanders Intermediate use by construction & services ind.	Flanders Final demand	Wallonia Intermediate use by primary & manufacturing ind.	Wallonia Intermediate use by construction & services ind.	Wallonia Final demand	Exports	Total	Production
Brussels	Goods	1.2	0.6	0.7	0.9	0.7	1.0	0.2	0.4	1.4	11.6	18.6	18.6
	Trade & transport services	0.2	1.6	4.4	0.5	1.7	1.1	0.2	0.8	0.8	6.3	17.6	17.6
	Other services	0.7	24.6	20.4	3.2	12.1	14.4	1.5	5.2	6.4	15.1	103.6	103.6
Flanders	Goods	1.4	1.5	1.0	22.3	13.2	11.4	2.3	1.7	4.2	78.7	137.5	137.6
	Trade & transport services	0.3	1.9	0.9	7.1	14.9	23.5	0.8	1.7	1.5	38.7	91.4	91.4
	Other services	0.4	9.8	1.9	10.7	68.7	106.1	1.3	3.9	2.0	18.4	223.3	223.3
Wallonia	Goods	0.3	0.5	0.2	2.7	1.3	1.1	4.6	3.6	4.5	21.0	39.8	39.8
	Trade & transport services	0.1	0.8	0.3	0.7	1.7	0.7	1.4	3.2	10.1	5.1	24.1	24.1
	Other services	0.2	3.4	0.9	0.9	3.0	1.4	3.2	19.5	51.8	8.3	92.6	92.6
Imports	Goods	11.9	2.6	4.5	54.1	12.0	24.1	11.7	3.6	8.9	68.5	201.9	201.9
	Trade & transport services	0.1	2.0	0.0	2.1	12.4	0.3	0.5	0.9	0.3	0.0	18.5	18.5
	Other services	0.4	11.2	0.7	6.8	12.1	1.6	2.9	4.1	1.0	5.1	45.9	45.9
Taxes less subsidies on products		0.1	1.8	3.0	0.9	4.1	17.2	0.3	1.7	9.0	0.2	38.2	38.2
Value added		1.9	58.3	0.0	31.8	149.8	0.0	12.1	63.3	0.0	0.0	317.3	317.3
Total		19.1	120.7	38.9	144.7	307.7	203.9	43.0	113.5	101.8	277.0	1370.2	1370.3

(*) The numbers exclude the 0.3 billion euro use by the Belgian extra-regional area (which includes the Belgian diplomatic and permanent army post abroad)

Table A.11 **Interregional use table 2010 in basic prices, after specific adjustments (before RAS B and C)**
billions of euro

Origin	Product	Brussels Intermediate use by primary & manufacturing ind.	Intermediate use by construction & services ind.	Final demand	Flanders Intermediate use by primary & manufacturing ind.	Intermediate use by construction & services ind.	Final demand	Wallonia Intermediate use by primary & manufacturing ind.	Intermediate use by construction & services ind.	Final demand	Exports	Total	Production (RAS A) & imports totals
Brussels	Goods	2.3	0.6	0.8	1.0	0.6	1.0	0.2	0.3	1.4	9.5	17.7	17.8
	Trade & transport services	0.3	1.5	4.8	0.8	1.6	1.1	0.2	0.9	0.8	5.7	17.6	17.6
	Other services	0.8	22.4	20.6	3.2	11.6	14.9	1.5	5.1	6.8	16.0	103.0	102.1
Flanders	Goods	1.4	1.5	1.0	23.1	13.4	11.6	2.3	1.6	3.3	81.8	141.1	140.1
	Trade & transport services	0.4	2.0	0.9	9.6	15.6	25.1	1.1	1.8	1.5	31.3	89.3	88.5
	Other services	0.4	9.6	1.9	11.0	67.7	110.2	1.4	4.0	2.1	19.0	227.5	227.0
Wallonia	Goods	0.3	0.5	0.2	2.7	1.3	1.1	4.6	3.6	4.5	21.8	40.6	39.9
	Trade & transport services	0.2	0.8	0.3	1.0	1.8	0.7	2.0	3.3	11.3	2.7	23.9	23.8
	Other services	0.1	3.2	1.1	0.9	2.8	1.5	3.2	19.4	53.5	9.2	95.0	93.9
Imports	Goods	9.9	2.7	4.8	52.8	11.9	24.9	11.6	3.6	9.5	71.0	202.6	192.1
	Trade & transport services	0.1	1.9	0.0	2.1	12.4	0.3	0.5	0.9	0.3	0.0	18.5	20.1
	Other services	0.5	11.4	0.9	5.5	12.6	3.3	2.7	4.3	1.5	4.7	47.5	50.5
Taxes less subsidies on products		0.1	2.1	3.0	0.9	4.5	16.8	0.3	1.8	8.8	0.3	38.5	38.5
Value added		1.8	58.7		34.6	153.1		13.3	64.7			326.3	326.3
Total		18.6	119.0	40.4	149.1	311.0	212.6	44.8	115.2	105.3	272.9	1389.0	1378.2
Total from Regional Accounts (2016 ESA 2010)		18.7	118.8	39.9	146.3	309.3	209.8	43.1	114.5	105.3	272.5	1378.2	

Table A.12 **The adjusted interregional use table in basic prices for 2010 in ESA 2010, final result**
billions of euro

Origin	Product	Brussels Intermediate use by primary & manufacturing ind.	Brussels Intermediate use by construction & services ind.	Brussels Final demand	Flanders Intermediate use by primary & manufacturing ind.	Flanders Intermediate use by construction & services ind.	Flanders Final demand	Wallonia Intermediate use by primary & manufacturing ind.	Wallonia Intermediate use by construction & services ind.	Wallonia Final demand	Exports	Total
Brussels	Goods	2.5	0.6	0.7	1.1	0.6	0.9	0.3	0.3	1.3	9.6	17.8
	Trade & transport services	0.2	1.4	4.7	0.7	1.6	1.3	0.2	0.8	1.0	5.5	17.6
	Other services	0.8	21.9	20.3	3.5	11.4	15.5	1.6	4.9	6.9	15.3	102.1
Flanders	Goods	1.6	1.4	1.0	23.5	12.2	10.9	2.6	1.6	3.5	81.7	140.1
	Trade & transport services	0.4	1.6	0.9	9.6	15.4	24.9	1.1	1.6	1.7	31.4	88.5
	Other services	0.5	9.8	2.2	11.1	67.1	108.8	1.6	3.9	3.1	19.0	227.0
Wallonia	Goods	0.2	0.5	0.3	2.8	1.3	1.1	4.3	3.3	4.3	21.8	39.9
	Trade & transport services	0.2	0.8	0.3	1.0	1.7	0.7	1.8	3.2	11.3	3.0	23.8
	Other services	0.2	3.2	1.1	1.0	2.7	2.1	3.1	18.4	52.8	9.2	93.9
Imports	Goods	9.6	2.4	4.4	48.6	10.8	23.0	9.8	3.3	9.0	71.0	192.1
	Trade & transport services	0.1	2.4	0.0	2.6	12.8	0.2	0.6	1.2	0.1	0.0	20.1
	Other services	0.5	12.0	1.0	5.2	14.3	3.5	2.5	5.4	1.4	4.7	50.5
Taxes less subsidies on products		0.1	2.1	3.0	0.9	4.5	16.8	0.3	1.8	8.8	0.3	38.5
Value added		1.8	58.7		34.6	153.1		13.3	64.7			326.3
Total		18.7	118.8	39.9	146.3	309.3	209.8	43.1	114.5	105.3	272.5	1378.2