METHODOLOGY TO ESTIMATE EUROPEAN MATRICES OF TAXES LESS SUBSIDIES ON PRODUCTS (1995-2007)

(with a separation of non-deductible VAT, taxes on products and subsidies on products)

SUMMARY

(Draft version)

July 7th, 2014

Editors:
José M. Rueda-Cantuche (JRC-IPTS)
Antonio F. Amores (JRC-IPTS)

Leading authors:
César Martín Núñez
Marisa Asensio
Elena Márquez

Main contributors:
Ana Martin
Ana Fernández
Laura Riesgo
Raúl Brey
Alfredo Ariza

(Pablo de Olavide University)

Table of Contents

1. Introduction

One of the aims of the TISSUE Project (contracted to the Pablo de Olavide University at Seville by the European Commission's Joint Research Centre- IPTS) is to estimate taxes less subsidies on products matrices (TLSPM) for Europe and for each Member State of the European Union (EU). These matrices will have VAT separated from the rest of the taxes less subsidies on products. If possible, the other taxes less subsidies on products will also be disaggregated between taxes and subsidies.

In order to do this task, the JRC-IPTS was expected to provide the taxes less subsidies on products matrices for each Member State for the period 1995-2007. However, this data was not available on time for most of the Member States. Hence, the strategy changed to a full estimation of the TLSPM using other data sources (see Annex). During the kick-off meeting of the TISSUE Project on September 2012, there was an agreement to make the estimations using the NACE Rev. 1.1 classification.

2. Methodology to estimate matrices of taxes less subsidies on products in each member state

According to the European System of Accounts (ESA-95), set out in the Annex A of Council Regulation (EC) No 2223/96 of 25 June 1996 and ESA 2010 set out in Regulation (EU) N°549/2013 of 21 May 2013, taxes on products (TP) are taxes that are payable per unit of some good or service produced or transacted. The tax may be a specific amount of money per unit of quantity of a good or service, or it may be calculated ad valorem as a specified percentage of the price per unit or value of the goods and services produced or transacted. As stated by ESA three different categories of TP can be distinguished:

1. Value-added type taxes (VAT, ESA95 and ESA 2010 code D211).). These taxes fall on goods and services collected in stages by enterprises and which are in the end charged in full to the final purchasers.

2. Taxes and duties on imports, excluding VAT (D212). These include compulsory payments charged by governments or the institutions of the EU on imported goods in order to admit them to free circulation on the economic territory, and on services provided to resident units by non-resident units. VAT is excluded in this category, since it is included in the first category.

3. Taxes on products, excluding VAT and import taxes (D214). These taxes comprises taxes on goods and services that become payable as a result of the production, export, sale, transfer, leasing or delivery of those goods and services, or as a result of their use for own consumption or own formation, and were not included in the previous two categories.

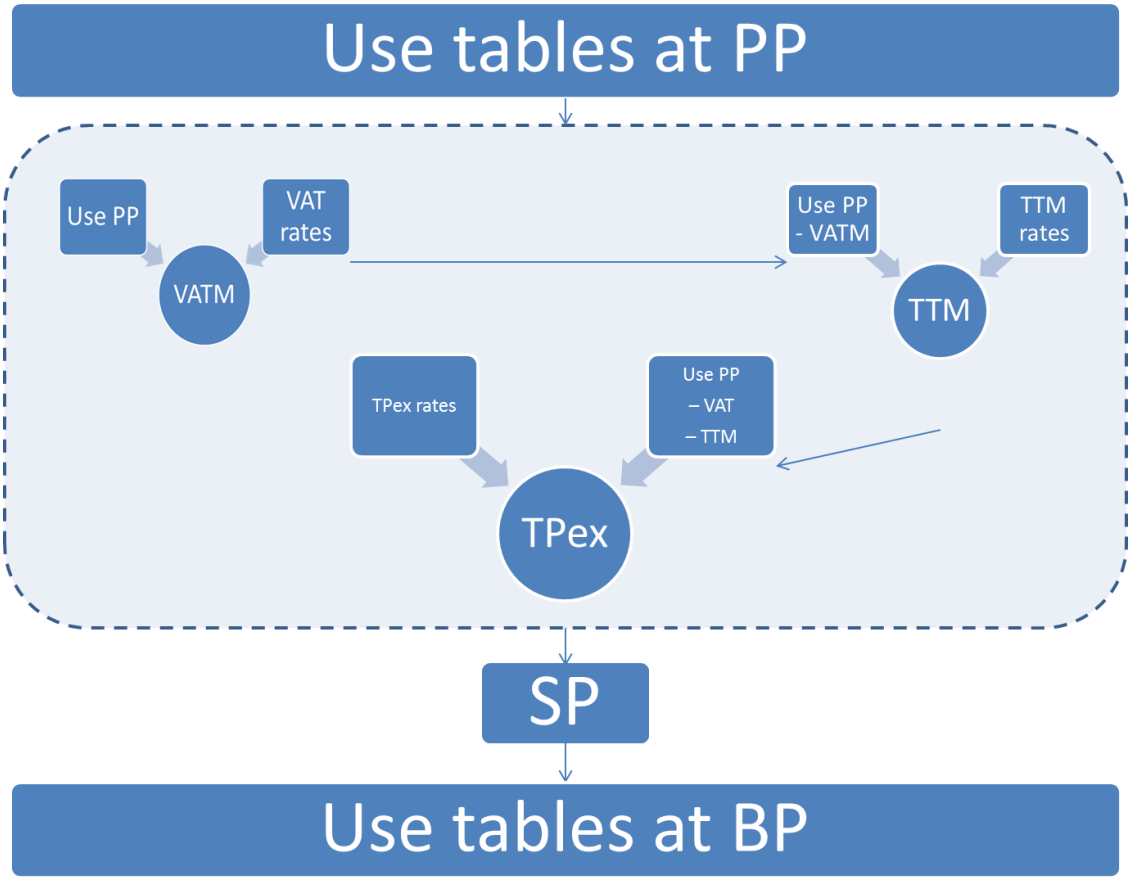
In addition, subsidies on products (SP, D31) are subsidies payable per unit of a good or service produced or imported. The subsidy may consist of a specific amount of money per unit of a good or service, or it may be calculated ad valorem. A subsidy may be calculated as well as the difference between a specified target price and the market price paid by a purchaser.

In an input-output framework, matrices of TLSP provide valuable information to model an economy and to simulate the impact of economic policies.

The methodological approach requires estimating first the VAT (D211) matrix. Once this matrix is estimated, it is subtracted from the purchasers' prices (USEPP) in order to estimate a matrix (USEPP_VAT) that includes both the transport and trade margins matrix and the TLSP matrix, VAT excluded. Next, transport and trade matrices and a matrix of the taxes on products, VAT excluded, are estimated. Transport and trade matrices will be subtracted from the USEPP_VAT. To make all these matrices coherent with the information of supply tables at basic prices and their valuation at purchasers' prices.

Once the previous matrices were estimated, use tables can be valued at basic prices. To do this valuation a wide range of information from Eurostat, the European Commission (EC) and the EU Member States was used.

Figure 1. Procedure



2.1.- Estimation of a non-deductible VAT matrix for each Member State

Provided that the non-deductible VAT is included in the valuation of a product at purchasers' prices, the VAT matrix (VATM) will be estimated using the use table at purchasers' prices (USEPP).

Average VAT rates by product were applied to the columns of the intermediate demand and to the elements of the final demand of the USEPP, whenever a transaction includes non-deductible VAT in values at purchasers' prices.

The average VAT rates will be collected from the documents "VAT Rates Applied in the Member States of the European Union", published by the European Commission (EC). These documents show the standard VAT rates applied in each Member State, the products charged by reduced rates and the exempted activities.

These EC documents describe goods and services charged with reduced VAT rates in more detail than those of the classification of products provided by the USEPP. Therefore, one single product might be included together with other goods and services charged with a different specific VAT rate in the USEPP matrix (e.g. the standard VAT

might be charged on several food products under ‘Food products and beverages’ and the reduced VAT might be charged on others).

Provided that non-deductible VAT is mostly allocated to households’ final consumption expenditure at purchasers’ prices, we have used weighted VAT rates using the households’ budget structure of each year as weights. This budget structure is derived from the “Household Budget Surveys” (annual data) published by Eurostat.

Once a table of average VAT rates was calculated by using the USEPP product classification, and taking into account which activities cannot deduct VAT in their intermediate consumption at purchasers’ prices, a first estimation of the VAT matrix is done.

Next, we calculate the difference between the overall non-deductible VAT of the first estimation of the VAT matrix and the overall non-deductible VAT from the national accounts published by Eurostat. The imbalance will be adjusted by applying an iterative adjustment procedure, since the relative differences found were not significant (deviations range between -5% and 5% for most of the Member States) and assuming that the overestimation/underestimation of an average VAT rate caused by this methodological assessment will have the same effect on all the products.

Differences between the “Use table at purchasers’ prices” (USEPP) and the VAT matrix were estimated, obtaining a new matrix (USEPP_VAT). We have checked that the full matrix contains non-negative values (i.e. subtracting VAT may cause negative values on the matrix).

This process has been applied to every Member State using its own yearly average VAT rates.

2.2.- Estimation of trade and transport margins matrices

The “Supply table at basic prices, including a transformation into purchasers' prices”, shows a column vector of "Trade and transport margins” that includes the trade and transport margins for each of the products of the supply table. In addition, the total value of the rows shows the total trade and transport margins of wholesalers, providing information on the weight of each of these margins over the total in the economy of each country.

Considering both the overall trade and transport margins per product and the weight of each margin in the economy, three vectors were obtained showing the average transport margins, and the wholesale and retail trade margins per product.

Assuming that all activities are equally charged by average VAT rates, each of these vectors was applied to the matrix USEPP_VAT (obtained by subtracting the VAT matrix from the USEBP). As a result three matrices were obtained: a transport margin matrix, a wholesale trade margin matrix and a retail trade margin matrix.

We calculate first the difference between the overall margins (transport, wholesale trade and retail trade margins) calculated using the approach explained above and the values of the column "Trade and transport margins" per product obtained from the supply table.

Differences encountered forced to adjust the imbalances. First for the imbalance of transport and wholesale trade margins, the adjustment was made on the basis of a flat rate since the relative differences were not significant. Secondly for the imbalance of retail trade margins the adjustment was made by doing a proportional adjustment of the differences considering the weight of each component in the use tables.

2.3.- Estimation of a matrix of taxes on products, VAT excluded, for each Member State

Provided that the product taxes, VAT excluded, (TPex) mechanism charge the tax rate to the value of a product at purchasers' prices, the so called matrix of taxes on products VAT excluded (TPexM) is estimated by using a close approximation of the use table valued at basic prices.

Since the information of the "Use table at basic prices" (USEBP) is not available for most of the Member States, the closest valuation to this table is done by subtracting the VAT and the trade and transport margins from the purchasers' prices. Then we obtain the matrix USEPP_VAT_TTM which includes the basic prices plus the taxes on products less subsidies on products.

We estimated one vector of the most representative average tax rates for TPex (D212 and D214) from: the "Annual Government Finance statistics" (Eurostat); the database "Taxes in Europe - Tax reforms" and the National Tax Lists "NTLs 2013" (European Commission). Next, the matrix of the most representative taxes on products (D212_D214) is obtained by applying the vector of the most representative average tax rates for TPex to the intermediate demand and final demand matrices (USEPP_VAT_TTM) and assuming that all the activities are charged with the same average rate tax.

This methodology guarantees the equality between the overall value of the estimated tax matrix (TPexM) and the value published in the National Accounts.

This procedure will be replicated for every Member State using their yearly average rate of taxes on products (D212 and D214).

2.4.- Estimation of a matrix of Subsidies on Products for each Member State

There is little statistical information available about subsidies on products (SP) for most of the Member States, even at aggregated level. As a result, this component has been estimated as a residual.

By using the VAT matrix a vector of non-deductible VAT per product can be obtained, in the same way than the vector of the most representative average tax rates for TPex per product was obtained from the taxes on products matrix (D212_D214). The sum of these two vectors results in a third vector that shows the amount of TPex on each product.

Since the "Supply table at basic prices, including a transformation into purchasers' prices" shows a column with "Taxes less subsidies on products" the difference between that table and the TPex vector gives an approximation to the SP vector per product.

Despite in the previous two matrices an adjustment has been carried out to guarantee the coherence with the National Accounts, this balance includes estimation errors in the breakdown per product. The adjustment has been done for the whole matrices, hiding some discrepancies that may exist in the breakdown per product, more specifically differences between the estimations obtained from the methodology used and the estimations used in each country to do the valuation change.

3.- References

- Council Regulation 2223/96/EC, Council Regulation No 2223/96 of 25 June 1996 on the European system of national and regional accounts in the Community (ESA95).
- Eurostat (2008): European Manual of Supply, Use and Input–Output Tables. Methodologies and Working Papers, Luxembourg: Office for Official Publications of the European Communities.

Annex: Data Sources

- **Information published by Eurostat in its website**

  1. "Annual national accounts":

D2 - Taxes on production and imports
D21 - Taxes on products
D211 - Value added type taxes (VAT)
D212 - Taxes and duties on imports excluding VAT
D214 - Taxes on products, except VAT and import taxes
D29 - Other taxes on production
D3 - Subsidies
D31 - Subsidies on products
D39 - Other subsidies on production
D21_M_D31 - Taxes less subsidies on products

2. “Annual government finance statistics”:

D2 - Taxes on production and imports
D21 - Taxes on products
D211 - Value added type taxes (VAT)
D212 - Taxes and duties on imports excluding VAT
D2121 - Import duties
D2122 - Taxes on imports excluding VAT and import duties
D2122A - Levies on imported agricultural products
D2122B - Monetary compensatory amounts on imports
D2122C - Excise duties
D2122D - General sales taxes
D2122E - Taxes on specific services
D2122F - Profits of import monopolies
D214 - Taxes on products, except VAT and import taxes
D214A - Excise duties and consumption taxes
D214B - Stamp taxes
D214C - Taxes on financial and capital transactions
D214D - Car registration taxes
D214E - Taxes on entertainment
D214F - Taxes on lotteries, gambling and betting
D214G - Taxes on insurance premiums
D214H - Other taxes on specific services
D214I - General sales or turnover taxes
D214J - Profits of fiscal monopolies
D214K - Export duties and monetary compensatory amounts on exports
D214L - Other taxes on products n.e.c.

3. “Household Budget Surveys”.

- **Information published and/or provided by Eurostat**

1. “Supply table at basic prices, including a transformation into purchasers' prices” of the member states

2. “Use table at purchasers' prices”, of the Member States.

- **Information published by the European Commission in its website**

1. "Taxes in Europe - Tax reforms" database (TEDB/TAXREF).

2. Documents “VAT Rates Applied in the Member States of the European Union”:

   - “VAT Rates applied in the Member and Accession States of the European Community (Situation at 30 October 2003)”.

   - “VAT Rates applied in the Member States of the European Community (Situation at 1st June 2005).

- “VAT Rates applied in the Member States of the European Community (Situation at 1st September 2006).

- “VAT Rates applied in the Member States of the European Community (Situation at 1st May 2007).

- “VAT Rates applied in the Member States of the European Community (Situation at 1st January 2009).

- “VAT Rates applied in the Member States of the European Union (Situation at 1st July 2010).

- “VAT Rates applied in the Member States of the European Union (Situation at 1st July 2011).

- “VAT Rates applied in the Member States of the European Union (Situation at 1st July 2012).

- “VAT Rates applied in the Member States of the European Union (Situation at 1st July 2013).

3. “NTLs 2013 (National Tax Lists) - Detailed list of taxes and social contributions according to national classification”.