

Integration the Hungarian SUT and I/O into the National Accounts

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Abstract

Hungary has been working on the introduction of ESA'95 rules concerning the SUT and IOT framework for several years. As a result of these improvements, the Hungarian SUT have been compiled since 1998 based on the commodity flow method. Since that we have transmitted the Hungarian data to the EU according to the ESA'95 Data Transmission Programme. Thanks to the Dutch-Hungarian co-operation we implemented the simultaneous compilation method of SUT at current and constant prices.

Although the concepts and definitions of the SUT and IOT are the same as in the National Accounts, due to the different data sources, methodology and cross-checking possibilities, the data in SUT could differ from the ones calculated in the frame of the regular NAs. It is important to investigate and explain the discrepancies between the two results. Recently considerable amount of progress and extensive harmonisation work has been made in the whole system of the Hungarian National Accounts to improve compliance with the ESA'95. In this connection the experience obtained in the SUT compilation, the problems occurred in the balancing processes and their solutions make a contribution to the NA developments.

The integration can be attained in two ways: fully and by basing. In the first way there is only one simultaneous compilation process, in the second way the integration means: basing provisional NA calculations on the – latest available – SUT, and revising them to get the definitive NA figures with the SUT for the same year. The final aim is the full integration of SUT and NA.

Introduction

Hungary has been working on the full introduction of ESA'95 rules concerning the SUT and IOT framework for several years. The compilation of IOTs has a long tradition in Hungary. Earlier there was compiled benchmark symmetric IOT, in every fifth year. Between two benchmark years simplified versions were estimated on the base of the latest detailed one. At that time IOTs were constructed as an extension to the regular NAs (like a satellite account) rather than an integrated part of them, without having any role in estimation of GDP. Compilation of main aggregates of GDP and IOTs were separated therefore there were hardly feedback between the two systems. The IOTs were used as a weighting scheme for double deflation method for production-side figures of GDP. In this period the IOTs served, first of all, analytical investigation purposes, and economic researches.

First stage of improvements – SUT for 1998

In 1998 there was a big turning point in our work. Since that the conceptual and practical compliance with the ESA'95 have been continuously improved. Having studied the international (Norwegian, German, English, Dutch) practices of compiling national accounts we came to the conclusion that there was an important change in ESA'95 in respect of SUT and IOT framework. The SUT has shifted into the centre of the compilation process of National Accounts (NAs). SUT are directly linked with the various basic statistics by product and industry and the sector accounts. This set of tables is very strong statistical and analytical instrument and is generally considered as a reliable way of calculating GDP figures. The symmetric input-output tables have no such direct link with the basic statistics, but they could be prepared by transformation of the SUT, using some supplementary information available. The SUT and the benchmark IOT for 1998 were compiled on the base of the newly introduced commodity flow method. At that time it was our main methodological development. We worked out a list of nearly 660 commodities (goods and services) representing the whole economy. In order to be able to connect different nomenclatures a master file has been made (so-called BRIDGE) which translates these nomenclatures into the list of commodities. Some problems raised in the data preparing process to fill up the SUT: lack of data, conversion of basic data to proper format, inconsistencies in the basic data sources or in the estimations made independently, the risk of double counting due to combining of the data of functional and institutional statistics. After filling up with data, in the Supply table the goods and services were valued at basic prices and in the Use table at purchasers' prices. In order to hold identities between supply and use, there was needed to make a transition between the two valuation systems. The transition from basic prices to purchasers' prices involved reallocating trade and transport margins, adding taxes on products (except deductible VAT) deducting subsidies on products. This transition was an important step of the balancing process. SUT filled with primary data were generally inconsistent. The elimination of the inconsistencies was the balancing process. The main identities – identity by products and the budget identity (by industry) were used to balance the data available from primary statistics. This balancing meant a process of searching, finding and correcting errors in the primary data as well. At the balancing of the data of SUT we took into account that the data on the supply side were the more reliable ones – but not in all cases. The balancing was made manually. Because of the relative great discrepancies automatic balancing methods were absolutely not applicable.

Second stage of improvements – SUT for 2000

The Hungarian SUT for 1998 were compiled at current prices only, but according to ESA'95 requirement it would be necessary to construct them at constants prices as well. In the frame of the Hungarian National Programme for the adoption of the statistical acquis of the EU, the full harmonisation was planned concerning the SUT. The ESA'95 describes the requirements and definitions in a rather accurate way, but does not give a precise methodology to know from what data to start and by what steps to reach the target. Therefore it was important to study the EU members'

practices. At that time there was a "Co-operation project between the Netherlands and Hungary in Statistics". The compilation of NA has got a high priority within this project in the management of the Statistical Office. This project gives us a good opportunity to study and implement a part of the Dutch NA System. The level of GDP and the GDP volume growth rate are calculated simultaneously in a process, where the SUT framework plays a fundamental role as balancing instrument. In the SUT for every entry there are available the following figures:

- data for n. year at current prices
- data for n. year at n-1.year's prices
- data for n-1.year at current (n-1. year's) prices
- price, volume and value indices.

The main advantages of compiling price and volume measures in that framework are:

- the extended checking on consistency of the set of data (finding mistakes in the balancing of data at constant prices may lead to change the figures at current prices);
- the plausibility checking by product (price indices gathered from different sources for the same commodity can be checked) and by branch (the volume change of intermediate consumption, value added and output for an industry can be contrasted with each other);
- it provides the indices for the balancing items (for example gross value added by double deflation method).

Within the project the annual SUT for 2000 were compiled simultaneously at current and constant prices on an experimental base. For that at first the SUT for 1999 was extrapolated based on the SUT for 1998. This work was very labour-intensive and in the first year is extraordinary because tables for two years have to be compiled parallel. An important part of the implementation of the Dutch method was the specification of the level of aggregation, the choice of index formulae and the choice of the base year to be used in the Supply and Use framework. First we have worked out a shorter, more aggregated list of commodities (135 groups) than it was applied by SUT compilation for 1998 taking into account:

- the level of availability of basic value, volume and price information (PRODCOM statistics, agricultural account data, statistics of service activities etc.);
- the destination purposes (households consumption, gross fixed capital formation, intermediate consumption);
- to make possible aggregation of commodity data into 2-digit level of CPA;
- the weight of a commodity group within the total supply;
- the calculation of taxes (different VAT rates, commodity liable to excise duties).

The Dutch suggestion for the constant price estimation was the use of a combination of Paasche price indices and Laspeyres volume indices and the changing base year (n-1).

For the year of 2000 in addition to traditional current price input data we had to collect all the available price and volume indices and information concerning the use and supply side. There is a big lack of

information for the service activities especially. To reduce the missing data we have organised expert estimations to get volume indicators for the services.

Compiling the SUT at current and constant prices simultaneously, we applied the Dutch working procedure that is the column-row-column method. First the specialists transform data received from basic sources into the NA format. They are responsible for completing the data for some estimation and for prices. The inputs from them are the columns in the SUT. There is an extra team of so called integrators, whose task is the balancing of the rows of the SUT. In that second step the data are “adjusted” in row-wise only, and at the same time, the data in column-wise are “untouched”. The large discrepancies in row-wise are analysed and discussed between the integrator and specialists. Automatic balancing is used for eliminating the small problems only. Otherwise the integrators balance the data manually. Third step: the occasional unacceptable changes in the columns are checked by the specialist and can be replaced. One of the characteristic features of the Dutch system is the automation. The main advantages of the automated integration system are the following:

- it is easy to investigate the major problems;
- it gives an efficient search to find the cause of these problems and their solutions;
- several calculations at detailed level can be performed automatically (for example: the margins and taxes on productions).

We implemented a Dutch software for balancing process. It is important for us to use up-to-date tools to support our work leaving the staff more time to analyse the results before release and to test the various options for balancing and to select the most appropriate one.

The data sources of the Hungarian SUT tables

The most important sources of the Supply table at current prices:

- the data of questionnaires of the structural business statistics survey,
- the PRODCOM survey (statistics of industrial products),
- agricultural production data from the Economic Accounts for Agriculture (EAA) and the commodity balances,
- data of the annual survey of the construction,
- data of the following activities: post and telecommunication, tourist accommodations and services, computer and related services, research and development services, cultural activity, sewage and refuse disposal services, repair services,
- output of the government sector broken down by functional tasks in details,
- output of the financial corporations sector,
- output of the sector of the NPISHs,
- estimation of the output of the household sector,

- data on imports from external trade statistics (database by CN code of product and by importer classified to branches), imports of services from the Balance of Payments by titles and broken down by estimation into commodities,
- administrative data sources (tax declarations, profit and loss accounts, and VAT statistics).

The most important sources of the Use table at current prices:

- input data on the structure of the intermediate consumption from statistical survey,
- the structure of the expenditure of government institutions from the budgetary reports,
- data collection of branch statistics related to the intermediate consumption structure of the agricultural activity,
- experts' estimation for the cost structure of the financial corporations,
- estimation for the cost structure of the own-account construction of dwellings by households and for the imputation of the own-account housing services by owner-occupiers,
- the energy consumption data from the energy balance,
- household consumption in detailed groups of commodities (household final consumption expenditure, the agricultural production for own final use, social transfers in kind, the balance of tourism expenditure),
- collective consumption at detailed level,
- data on the investment statistics and other items of the gross capital formation,
- data on the inventory statistics broken down into own produced and purchased goods,
- data on exports from external trade statistic database, export of services from the balance of payment,
- data on the value added components (compensation of employees, other taxes on production, other subsidies on production, gross operating surplus).

The most important sources of the valuation matrices:

- the turnover data on the trade activities, the turnover data broken down by the CPA classification for sale of motor vehicles and automotive fuel, wholesale trade, retail trade and repair services,
- data of the survey on the transport tariffs of goods by type of them in the field of railway and other transport, in the case of transport of goods the use of data of the transport performances report in natural terms,
- VAT and excise duty rates and items by groups of commodities, other taxes on products and customs data for the calculation of the matrix of taxes less subsidies on products.

Other sources for the constant price calculations:

- producer price indices by kind of industrial products and services and by the directions of the sales (domestic, export),
- volume indices of industrial production by branches (for consistency checking),
- unit value indices of imported/exported goods at CN code level from external trade statistics,
- consumer price indices by goods and services,
- price indices from the EAA (European Agricultural Accounts) at product level,
- volume and price indices of the construction industry at aggregated level;
- secondary price indices of the GFCF at aggregated level,
- volume and price indices of the retail trade,
- volume data of the transport activity from the transport statistics in natural terms, other price information from statistical observations by the type of the transport,
- volume and price information available from statistical observations of other service activities.

The result of the improvements

In 2001 the complete set of tables referring to 1998 was published on CD-ROM, at current prices. They are the Supply and Use tables, the Symmetric IOT (product by product and industry by industry as well), the Import matrix and the valuation matrices. (Trade and transport matrix and the Net taxes on product matrix). The next publication contained the SUT for 1999 and the revised SUT for 1998. At the beginning of this year we published the SUT and IOT for 2000 at current and at constant prices as well. Based on this development project we can fulfil the Data Transmission Programme under ESA'95 Annex B.

The current situation and future plan

As a result of own work and the PHARE projects (organised by EUROSTAT) for improving the compilation of SUT and symmetric IOT the Hungarian SUT and IOTs have been compiled regularly since 1998. The theoretical concept and the definitions are the same for the SUT/IOT and the National accounts, but due to the different data sources, methodology and cross-checking possibilities the data in our SUT differ from the ones calculated in the frame of the regular NAs. The discrepancies are being investigated, analysed and explained. On the base of this examination a feedback is made to the system of NA.

Recently many developments have been made in the Hungarian National Accounts System to improve compliance with the ESA'95. In this connection the experiences obtained in the SUT compilation, the problems occurred in the balancing processes and their solutions make a contribution to the NA developments. Besides the change of base year (to 2000) some other methodological changes were introduced in the annual NAs for 2000-2001 to improve compliance with the regulations of the EU.

Some of them were based on the SUT/IOT feedback or were tested in the SUT framework.

For example:

- In the new system the gross output of restaurants includes the consumed food and beverages, not only the “trade margins” on them.
- Some adjustments on the structure of the households’ consumption expenditure are based on the commodity flow approach.
- In the case of some special industries subcontractors’ performance is accounted by gross method as intermediate consumption, and of course as a part of the gross output. This way of accounting does not affect the GDP, but it affects the structure of gross output and intermediate consumption.
- Processing work on imported materials is accounted by gross method in contrast with the earlier practice (net method); this adjustment is calculated and tested in the SUT framework.

Having studied the ESA’95 and the international practices of compiling national accounts we realised that the SUT should play an important role as a coordination integration framework in it. The integration can be attained in two ways: fully and by basing. In the first way there is only one simultaneous compilation process, in the second way the integration means: basing provisional NA calculations on the – latest available – SUT, and revising them to get the definitive NA figures with the SUT for the same year. The final goal at the implementation of the commodity flow system was the integration of SUT compilation into the system of NA - by the means of a consistency “bridge” between the basic data sources and the calculation of GDP - but it can be achieved step by step.

GDP can be estimated by production, expenditure and income method. Theoretically each measurement should result the same estimation, but in practice the three approaches compiled independently can result three different estimates of GDP. In the traditional NAs the reconciliation between the three approaches is taken place at the global level, manually. Using SUT as an integration framework for the compilation of NA data the reconciliation between the three approaches to GDP is achieved during the preparation of the SUT at a detailed product level. The main difference between the SUT and the regular NAs is the product dimension.

Next tasks:

- decision making about the method of integration of SUT and NA (the possible ways of this integration: full integration or use of SUT for rebasing; and firstly at annual, secondly at quarterly level);
- design and build an quality assured new system;
- drawing up the connection between the annual and quarterly GDP estimation methods;
- making an organisational scheme of the new compilation process of NA figures (importance of the close co-operation between the experts of the branch statistics and the NA);
- speeding up the compilation process of the SUT (special attention on the working procedures of the simultaneous compilation of the current and constant price SUT: column-row-column method and on the role of the specialists and integrators, experimental work on breaking down of SUT by institutional sectors, computer support of the compilation work, automation of the system, using efficient IT infrastructure);

- integration of basic statistics into the NA system by creating a new intermediate database for NA;

Our future plan is to build on our results a fully integrated, more standard, transparent and more reliable estimates of NA figures.

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