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Development of Supply and Use Tables

Supply and Use Tables in Georgia

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Summary

The document presents the history of Supply and Use Tables in Georgia, which are published by the National Statistics Office of Georgia since 2006. It describes the sources and methods used and shows that it is possible to compile detailed Supply and Use Tables even with the limited number of staff and limited data sources. Special surveys of the structure of intermediate consumption and gross fixed capital formation were conducted in Georgia in order to obtain data in Supply and Use Tables format. The Supply and Use Tables framework contributes to the improvement of non-observed economy estimates, and respectively the quality of gross domestic product, and shows the weaknesses of data sources. The document colludes by indicating the problems in the current Georgian Supply and Use Tables and the challenges for the future, especially the need to increase the number of products and to implement Input-Output Matrix.

I. Introduction

1. Supply and Use tables (SUT) have been compiled in Georgia since 1998. At that time, due to the lack of data, Gross Domestic Product (GDP) was calculated at the section level of Statistical Classification of Economic Activities in the European Community (NACE) rev.1. In the following years, with the improvement of data sources, the calculation of GDP by 45 products has been launched. Consequently, work has begun to create a detailed SUT by 45 activities and 67 products.
2. In 2006, with the financial support of World Bank, International expert visited the National Statistics Office. During the visit, the analysis of data sources was carried out and recommendations were developed in order to improve survey questionnaires. At the same time, the data "catalogue" has been developed for collection and storage of data. Through the programme code, written in Visual Basic for Excel, the data catalogue is automatically transformed into the SUT.
3. In 2008, after implementation of recommendations, the second visit of international expert took place. The second visit made it possible to compile the detailed SUT for 2006 in current prices. Since then, detailed SUT are compiled annually and published on the website of National Statistics Office of Georgia (Geostat).
4. This report is structured as follows. Section II discusses the organization of work in National Accounts Division while section III deals with the data sources for SUT compilation. Procedures for balancing supply and use of certain products are discussed in section IV. Section V sums up the current status of SUT and highlights future plans for improvement.

II. Organizational structure and resources

5. National Accounts Division of Geostat includes 8 employees (head, two chief specialists, five senior specialists and one specialist). Division is currently responsible for the production of:
 - (a) Quarterly and annual GDP at current and constant prices;
 - (b) Monthly rapid estimates of economic growth;
 - (c) Industrial production index;
 - (d) Regional GDP;
 - (e) Annual SUT in current prices by 45 activities and 67 products;
 - (f) Annual online publication of national accounts;
 - (g) Accounts by institutional sectors and etc.
6. Given the fact that the work to be performed is a lot, while the number of employees is quite small, we try to distribute functions effectively among employees. All employees are involved in the process of data collection for SUT compilation. The work is distributed among employees according to the SUT indicators. Each employee is responsible for the collection of data on specific indicators of SUT. For example, one employee collects data on exports and imports of goods, while the second - on gross fixed capital formation etc. All employees are involved in the compilation of total output and intermediate consumption matrices. In this case, the work is divided according to the types of economic activities. For example, one employee has to collect data by agricultural activities, other deals with

manufacturing industries etc. In the end, all collected data are gathered in the data catalogue.

7. The initial stage of SUT compilation is setting up the data catalogue, which includes all the SUT indicators. Catalog is the specific format of the data set. Collection of data in specific format is necessary, because the programme code, written in Visual Basic for Excel, automatically gets SUT from the data catalogue. This programme code was written in 2008 by international expert Gosse Hommes.

8. Data catalogue includes at least three columns. It is possible to create new columns, where additional information can be collected. Data catalogue starts with total output matrix data. In this case, the first column shows the product code that takes values from P01 to P67. The second column shows the activity code that takes values from A01 to A45, while the third column represents the value of the Excel cells, which are located at the intersection of the corresponding activity and product. The same structure is used to store data of intermediate consumption matrix.

Table1

Part of the catalogue, which includes data of the total output matrix

<i>Field1</i>	<i>Field2</i>	<i>Value</i>
P_01	A_01	30.19
P_02	A_01	0.02
P_03	A_01	0.01
P_04	A_01	0.20

9. For the other indicators of Supply catalogue, the first column shows the product code, while the second column – System of National Accounts (SNA) code (for example, D21 in case of taxes on products). The third column contains the value of the corresponding indicator.

Table 2

Part of the catalogue for individual final consumption expenditure (P31)

<i>Field1</i>	<i>Field2</i>	<i>Value</i>
P_01	P31	136.6
P_02	P31	316.1
P_03	P31	483.9
P_04	P31	776.8

10. Since the draft version of SUT is compiled by using programme code, it is necessary to conduct balancing procedures for total supply and use by each product. Misbalances by products are distributed among employees. Each staff member analyses differences between supply and use in their products and adjusts it if necessary. Sometimes the difference is caused by one particular indicator, which is clearly defined outlier. In this case the employee adjusts the value of an outlier. However, in most cases the difference is not caused by one particular indicator. Therefore, at the final stage some indicators are defined as a "residual" and changed in order to ensure balance of supply and use by each product. Final SUT are published on the official website of Geostat.

11. The SUT framework helps significantly in the calculation of annual GDP. It should be noted that, during the calculation of annual GDP each staff member deals with the same economic activities as in SUT output matrix. This helps to better understand the specifics of the activities and assess the level of non-observed economy.

III. Data sources

12. SUT indicators and data sources from which they are taken are discussed below:

A. Total output (P1)

13. Output at basic prices is obtained from several sources:

- (a) Annual survey of non-financial corporations (Geostat);
- (b) Monthly data on commercial banks (National Bank of Georgia);
- (c) Quarterly data on insurance companies (Insurance State Supervision Service of Georgia);
- (d) Annual agricultural survey (Geostat);
- (e) Household budget survey (Geostat);
- (f) Monthly data of consolidated budget (Ministry of Finance);
- (g) Annual survey of non-profit institutions serving households (Geostat).

14. According to the data received from the Ministry of Finance of Georgia, there were approximately 60 thousand active enterprises in 2014. Annual survey of non-financial corporations covers about 14 thousand enterprises. Among them, large enterprises (around 8 thousand), with an annual turnover of more than 1.5 millions of national currency, are fully represented in the sample. Medium and Small enterprises are sampled, according to geographical location and type of economic activity.

15. The National Bank of Georgia (NBG) is responsible for supervision of commercial banks, while insurance companies are under supervision of the Insurance State Supervision Service of Georgia (ISSSG). Quarterly data on insurance companies are published on the ISSSG official website. The monthly data from NBG and quarterly data from ISSSG are detailed enough in order to calculate total output of the sector.

16. Agricultural output of small farms accounts for about 95 percent of total agricultural output. The remaining 5 percent is produced by large agricultural enterprises. The sample frame of the annual agricultural survey is based on the 2004 Census of Agriculture. There are about 815 thousand household farms that are included in the survey frame. An annual rotating sample technique is applied, where five thousand household farms are surveyed five times per year (annual survey and four quarterly surveys). The two stage sample design is applied. The first stage is a stratified random sample of villages within a region and the second stage - of households within a village.

17. The household budget survey is conducted on the basis of stratified sampling. 3600 households are selected quarterly from the population, which consists of approximately one million households. Monthly rotating sample technique is applied. As a result of the survey, it is possible to receive household's income and expenditure, as well as the value of processed agricultural products by households.

18. Consolidated budget includes data on compensation of employees and intermediate consumption. Total output of government sector is calculated as some of intermediate consumption, compensation of employees and consumption of fixed capital.

19. In case, if an enterprise has two or more than two types of economic activity or product, division of the total output is made according to the structure of turnover (value of sales). Usually, enterprises can easily identify the value of sales by each type of economic activity. But they find it difficult to record the distribution of operating costs by various

activities. This method does not take into account the structure of changes in inventories and other indicators, which cause the difference between total output and sales turnover. The problem is that at this stage it is not possible to divide the changes in inventories and other indicators by various types of economic activities. The questionnaire is not detailed enough to be able to do it. However, Changes in inventories have a small share in total output, and should not cause much difference between the structures of output and turnover.

20. It should be noted that total output, from the survey of the non-financial corporations, includes only the declared figures. The estimations of non-observed economy are added to these figures. These estimations are carried out separately according to the 45 types of activity and added to the declared values. By 2014, the share of non-observed economy was about 15 percent of total output.

B. Intermediate consumption (P2)

21. The detailed data on Intermediate consumption of non-financial corporations are collected annually through the regular survey. However, the survey questionnaire contains only a few detailed questions (rent, electricity, fuel, services rendered by external organizations, other operating expenses). Because of this, the detailed surveys on the structure of intermediate consumption are conducted once every five years. The questionnaire of detailed survey includes questions that allow us to classify operating costs according to 67 products of SUT.

22. Data from agricultural survey are used for compilation of the detailed structure of intermediate consumption in the household sector. For other activities, enterprises in the survey on non-financial corporations with less than 5 employees are considered as households.

23. Annual spending on intermediate consumption of the government sector is taken from the detailed budget data. Budget information is not enough to get the structure of intermediate consumption by all of the products. Because of this, government agencies were surveyed in the about the detailed structure of intermediate consumption. 2007 benchmark data are adjusted every year, taking into account the consolidated budget data.

24. Operation costs of commercial banks are recorded in the monthly data received from NBG. Moreover, the detailed structure of intermediate consumption is compiled every five years as a result of in-depth research. The compilation of the intermediate consumption structure for Non-Profit Institutions Serving Households (NPISH) is carried out every five year. Benchmark results are adjusted on the basis of data from annual survey.

25. Merging of data by all institutional sectors results in the compilation of intermediate consumption matrix by 45 activities and 67 products. On the next stage, intermediate consumption matrix is transformed into the three-column table and included in data catalogue.

C. Final consumption expenditure (P3)

26. Household final consumption expenditure is derived from the quarterly household budget survey. Household consumption is classified according to five-digit level of the Classification of Individual Consumption According to Purpose (COICOP). Through the correspondence table, data at COICOP's 4-digit level is connected to 4-digit level of the Classification of Products by Activities (CPA), which in turn are aggregated to 67 types of SUT product. In some cases, there are "many to many" relationships between the products at COICOP4 and CPA4 level, which is why we have to analyze the data further by

COICOP's 5-digit levels. The "raw data" from Household surveys are much smaller than that household final consumption expenditure in national accounts. One reason for this is that households hide their expenses for some products. Another reason is that the survey does not cover highest-income households as they refuse to answer on the questions. Underestimated data typically found in such products as tobacco, alcoholic beverages etc. Especially high rates of an incomplete declaration are in services (restaurants, gambling, education, health care, etc.). Household final consumption in accordance with this point is regarded as one of the least reliable indicator. When balancing supply and use, household final consumption is often seen as a residual for some products.

27. Final consumption expenditure of NPISH is considered as the sum of production costs minus sales of market production. Data are taken from the annual survey of these organizations.

28. Individual government consumption expenditure mainly includes health care and education. The data are obtained from the functional classification of consolidated budget (COFOG). Individual consumption expenditure includes the governmental programs, under which households receive service for free in health care, education and other fields.

29. According to SNA 2008, the collective consumption expenditure of government is non-market production of public agencies, which is measured as follows: Consumption of fixed capital + intermediate consumption - revenues from the sales. Government budget includes all above mentioned indicators except the consumption of fixed capital, which is calculated by the perpetual inventory method.

D. Gross fixed capital formation (P51)

30. Investments in fixed assets for non-financial corporations sector are calculated based on the annual survey results. In the survey questionnaire the fixed capital is broken down by details, which allows getting detailed structure of Gross fixed capital formation. An additional auxiliary factor is that a lot of equipment is not produced in Georgia and its supply is completely determined by the value of imports.

31. Consolidated budget includes data of gross fixed capital formation for the government sector. Government finance statistics (GFS) are prepared according to GFS manual, where acquisition of non-financial assets is recorded separately.

32. Household investment mainly consists of the costs related to livestock and perennial plants, which are obtained from the agricultural survey. A large part of household investments, including own construction and major repair, is also recorded in the household budget survey.

E. Changes in inventories (P52)

33. Data on changes in inventories for non-financial corporations are derived from the quarterly survey. However, there are no appropriate data sources to measure the changes in stocks for the rest of the sectors and conditionally changes are equal to 0. Because of this changes in inventories are considered as the most unreliable indicator in our system of national accounts.

F. Exports/Imports of goods and services (P6/P7)

34. Initial data are obtained from customs declarations, which are adjusted by non-observed economy and finally included in the Balance of Payments (BOP). In customs

declarations exports and imports of goods are recorded using the Harmonized System (HS) classification. Through the correspondence table, the 6 digit codes of HS are connected with the CPA's 4-digit codes, which are then aggregated in the 67 SUT products. The difference between the "raw data" from the customs declarations and the overall balance of payments figures is distributed proportionally to the structure declared values. Value of non-observed import is small and usually does not exceed 1 percent of total imports, while non-observed export is significant and accounts to approximately 35 percent of the total exports.

35. Detailed BOP data allows collecting information on exports and imports of services. The large part of exports of services comes for outbound tourism. Expenditure of Tourists is obtained from the tourism surveys. Such studies are not conducted every year, which reduces the reliability of this indicator.

G. Taxes on products (D21)

36. Consolidated budget revenues include detailed data on value added tax (VAT), excise tax and customs duty. Excise tax is applied to 5 kinds of products: automobiles, petroleum products, tobacco, alcoholic beverages and certain specific chemical products. Detailed data for taxes on products are available for those 5 kinds of excise products. However, the Ministry of Finance does not produce detailed data for the non-excise goods. Consequently, the calculation of taxes on products for the rest of the products is made according to the so-called "base tax rate" method. In this case, the tax rate for each product is determined under the tax code. For most products VAT rate is 18 percent of total turnover. Some economic activities, such as agriculture, education and health care, are almost fully exempt from paying VAT.

H. Subsidies on products (D31)

37. Subsidies on products can be found in Georgia mainly for grapes and electricity. Data on the total amount of subsidies are obtained from subsidy implementing agencies (the Ministry of Agriculture, the social service agency). The share of subsidies on products in GDP is quite small and accounts less than 1 percent in Georgia.

IV. Balancing procedures

38. After launching of the programme code the primary SUT are derived. In primary SUT supply at market prices and use at purchasers prices do not match each other for almost all products. For some products the difference is too large, which clearly indicates that at least one data source is wrong. After finding an error, the value of the corresponding indicator is changing in the catalog, and then the programme code is being re-run.

39. After the correction of errors SUT are still unbalanced by many products. Further balancing procedures are conducted in the following order:

(a) Special services are pointed out, which have only one or a few users, such as government nonmarket services, agricultural services, and transport by pipeline. To achieve balance between supply and use for those products it may be necessary to change the structure of total output, intermediate consumption (IC) or government final consumption expenditure.

(b) All other services (products 34-67). These differences are added to household consumption (but then balanced with a similar change in some goods, so that total

household consumption is retained), but in some cases the structure of IC will also be changed.

(c) Goods (products 1–33). If these differences are small, they are added to changes in inventories, whereas bigger differences will be examined and may lead to changes in other uses. Balancing may also be obtained by reallocations in the column for trade margins or in the allocation between primary and secondary products in the supply matrix. Apart from this, the supply will not be changed. When there are big differences for construction, the structure between the three construction products and/or investment structure may be changed.

40. In the balancing, the column for trade and transport margins in the supply matrix plays a special role. Initially this column is filled in with the data from the previous year. The first balancing step is to balance the rows for retail and wholesale trade and the transport activities that supply the transport margins. The share of transport that goes into transport margins is determined residually after deducting estimated transport for IC and final uses. From the 2013 transport survey, more information will be available. Following these steps, total supply of trade and transport margins will be known. For food products, the absolute margins are determined directly based on the difference between the producer price index (PPI) and consumer price index (CPI) absolute prices for each type of product. The remainder of the total for trade and transport margins is in the next step distributed proportionally on the domestic supply of goods (output + imports – exports). It is thus assumed that the domestic supply of all these goods have identical percentage margins (made up of wholesale, retail, and transport margins). The column for taxes on products has been determined by first allocating the excise taxes to the specific products, and then distributing the remainder in proportion to total supply (output + imports – exports). Subsidies on products are directly allocated to the relevant products. The columns for taxes and subsidies are not changed during the balancing.

41. The role of the SUT in the compilation of the annual accounts is to underpin the balance between supply and use, not only at the aggregated level, but also by product, which is a much more efficient tool. Usually the balancing of the SUT will not give rise to changes in the original total output and IC by industry (except in cases where new surveys may indicate it), but on the expenditure side, changes may be made in particular to household consumption as result of the balancing. Thus, the SUT is not “ex post” to the annual account even though it is published about one month later.

V. Future plans

42. At this stage, SUT at current prices are calculated annually. The programme code written in Visual Basic for Excel makes this exhaustive process relatively easier. However, data collection is still time consuming and requires quite a lot of labor. Moreover, considering the weak data sources, quality of SUT might not be satisfactory. Despite the weak data, the compilation still makes sense as they indicate the specific weaknesses and helps for the future improvements.

43. The implementation of SNA 2008 is planned for 2017. One step for implementation is to replace existing economic classification of economic activities NACE rev1.1 with the new NACE rev.2. This means that activities and products as well as the correspondence tables should be changed.

44. Along with the introduction of new classifications, the number of activities and products in SUT will be changed. Our goal is to increase the number of activities and products as far as possible. The minimum requirement for new SUT will be 60 activities and 60 products, which will be in line with Eurostat requirements.

45. Until 2015, GDP at constant prices was calculated only by production approach. Calculation of GDP at constant prices by expenditure approach was implemented in 2015. Consequently, it is planned to start the compilation of annual SUT at constant prices.

46. The compilation of input-output matrix has started since 2016. For this purpose, we need to initiate international cooperation within the framework of technical assistance, which will allow us to create software for the compilation of input-output matrix at current and constant prices.
