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The effect on GDP by integrating Supply and Use Tables in the National Accounts for a developing country

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Abstract

Statistics Norway has a long tradition of compiling national accounts with integrated Supply and Use Tables (SUT) and providing technical assistance to other countries. The ongoing National Accounts project in Malawi is a component of an Institutional Cooperation project between National Statistical Office (NSO) of Malawi and Statistics Norway. The goal of the project is to contribute to poverty reduction by efficient policy planning based on reliable national accounts figures.

The objective of the National Accounts project has been to develop an improved methodology implementing UN's SNA 1993 and a new, efficient IT technique (SNA-NT) to strengthen the compilation of the National Accounts for Malawi. The first milestone has been integrating Supply and Use Tables (SUT) in the annual compilation process from the year 2002.

This paper will focus on the experience from introducing SUT in Malawi and the importance of utilising all existing economic statistics and administrative data sources, such as Crop estimates, Annual Economic Surveys, detailed Government accounts, Tax data, Import and Export statistics, Custom duty and Excise duty, Household expenditure surveys and Consumer price indices. For analysing the Malawian economy, the distinction between "Production for own use, Market production, Government accounts and Non Profit Institution Serving Households (NPISHs) is important and also a detailed industry and product breakdown.

Balancing the different data sources in a systematic and well-documented SUT framework has provided important quality checks of the data and enabled more of the important informal economy in Malawi to be included in the national accounts compilation. The improved quality, coverage and timeliness of the national accounts system gives a much better basis for the economic and social policy planning. The SUT compilation establishes a database, which also allows the development of Input-Output Tables in current and constant prices at different levels of aggregation. The input-output tables can give a split between Competitive and Non-competitive imports, which allows study of the importance of imports in general and the dependence of imported products on industry production and components of final demand.

Contents

1. The challenge in Africa

For many African countries, there is a strong demand for more reliable statistics to provide a basis for measuring and monitoring the development goals, targets and indicators set out in the countries Poverty Reduction Strategies (PRSs) and in the internationally endorsed Millennium Development Goals (MDGs). Despite stronger demand, resources for statistical development have not been sufficient to meet those increased policy needs.

For IMF and users in the African countries, good quality and timeliness of the national accounts system is very important for economic planning for future economic growth.

Many of the African countries have not yet implemented a national accounts system drawn up according to the international standards adopted in the 1993 SNA. A common methodology for African countries is to compile national accounts from the supply side without independent expenditure estimates. The estimation of current prices GDP can be wrong, mainly underestimated. The estimation of GDP in constant prices and annual growth are even more problematic because of weakness in price and volume indicators used for the constant price estimates.

2. Institutional co-operation project between the National Statistical Office , Malawi and Statistics Norway

2.1. The Malawi Growth and Development Strategy programme.

The goal of the Malawi Growth and Development Strategy (MGDS) programme is to strengthen and further build the capacity of the National Statistical Office (NSO), the Ministry of Economic Planning and Development (MEPD) and the Ministry of Finance (MoF) for production of statistics, for mid- and long-term social and economic fact-based policy planning for the MGDS, and for overall policy development planning, comprising economic and social sector lines.

Malawi is a land locked country in South Central Africa bordered by Tanzania to the north, Zambia to the west and Mozambique to the east and south. Malawi has a population estimated to around 12 million in 2004 and 13 million in 2007. The country is one of the world's poorest countries measured with GDP or GNI per capita. 55% of the population is living under UN s' poverty line, one US $ a day. Agriculture is the principal industry.

Within the co-operation between NSO, Malawi and Statistics Norway, the objective of the National Accounts project is to introduce an improved methodology and efficient software in NSO for the compilation of the National Accounts for Malawi, following UN's SNA93. Reliable and timely national accounts figures are very important for the monitoring of Malawi's economy.

Statistics Norway also gives assistance to Ministry of Economic Planning and Development (MEPD) for developing a Macro Economic Model for medium term and long term planning. Reliable and more complete national accounts are important as a database for this model project.

2.2. Supply and Use Tables for Malawi

The first milestone for the Norwegian National Accounts project in Malawi has been to compile new national accounts figures with integrated annual Supply and Use Tables (SUT) in current and previous year's prices for the three years 2002, 2003 and 2004.

The decision to develop the National Accounts system with integrated SUT was based on the desire to utilize all existing economic statistics and administrative data sources for Malawi in a systematic and standardized way for the national accounts compilation. Important data were Crop estimates, Annual Economic Surveys, Government budgets and accounts, Tax data, External Trade statistics, Integrated Household Surveys and Consumer price indices.

SUT for Malawi have the following main functions/advantages:

- *An efficient confrontation and check of economic statistics and other data sources*
- *An ideal framework for different value concepts (basic value, purchasers' value etc.)*
- *An important tool for constant price estimates (the double deflation technique) giving balanced SUT in both current and constant prices.*
- *Important for analysing the effect of imports and exports on the country's economy.*
- *Database for converting to Industry format Input-Output tables (IOT) in current and constant prices*
- *Database for econometric models and economic planning purposes*

2.3. The first project results

During 2005 and 2006, the National Accounts/SUT team in NSO has utilized all economic statistics and other available data sources to prepare input data for compiling the first Supply and Use Tables (SUT) for the years 2002, 2003 and 2004.

Balancing the different data sources for Malawi in a systematic and well-documented SUT framework using the SNA-NT software application and methodology has provided important quality checks on the statistical data. Several revisions of the Annual Economic Surveys (AES) for the years 2002, 2003 and 2004 required corrections of the input data and the balancing of the SUT. Lack of data in several areas also required estimation based on various indicators.

To achieve acceptable national accounts figures for Malawi, several rounds of corrections were required. Different analytical tables, produced automatically by SNA-NT, were analysed during the correction phase.

The Ministry of Finance put a lot of pressure on NSO to get the revised national accounts data early in 2007, as input to the 2007-08 budgets.

The first NA/SUT 2002 was finished in September/October 2006. With extra efforts by the SUT team in NSO and the Norwegian short-term advisors, the new National Accounts time series for 2002, 2003 and 2004 were finalized by the end of February 2007, in line with the agreed deadline.

<u>The following procedure was followed for releasing the new figures:</u>

On 6 March National Accounts tables with the new figures for 2002-2004 were made available to the Ministry of Economic Planning and Development (MEPD), only for use as data input for the new macro economic model. During March the new time series for 2002-2004 also with preliminary estimates for 2005 and 2006 were presented to the Secretary to the Treasury and later to the Minister of Finance and to the "National Accounts and BOP Technical Committee.

Finally, the new National Accounts for the years 2002-2004 together with preliminary figures for the years 2005 and 2006 were launched to the public on 27 March 2007 at a large workshop in Lilongwe, chaired by the Commissioner of Statistics, Charles Machinjili. At the launch of the new data, the Finance Minister, Honourable Goodall Gondwe said that he had for a long time felt that the country's economy had been understated and that the new national accounts data gave a much better picture of the country's economy. He also said that the introduction of the new national accounts follows the decision to change the methodology of getting GDP estimates from the "production approach" to compile more comprehensive "Supply and Use Tables".

2.4. Summary of the new GDP results for Malawi compared with the old figures

Comparison between the old and new estimates show that the level of GDP in current prices has been revised up by about 37.5 per cent see **Table 1**.

Table 1: GDP Market prices, 2002-2006, Billion Kwacha, current prices

	2002	2003	2004	2005*	2006*
New estimates	204.4	236.2	285.9	338.0	430.3
Previous estimates	148.4	171.9	207.2	245.9	313.8
Revision, per cent	37.7	37.4	38.0	37.5	37.1

Source: National Statistical Office. Malawi

The figures for 2005 and 2006 are preliminary estimates based on the old growth rates and price indices. Final national accounts figures for 2005 will be compiled during the year 2007. The main reasons for the upward revision are improved coverage of medium and small-scale businesses, NPISH, and production for own use.

Table 2, next page shows the revisions in value added by activity in current prices in 2004. The old national accounts data for Malawi were compiled in 1994-prices. In order to calculate the current price values, the deflator for total GDP were used for all activities. This means that the revisions by activity are very approximate.

Table 2 GDP by activity, 2004, billion Kwacha, current prices. New and previous estimates

	New estimates	Previous estimates	Revision	Per cent
Agriculture	90,6	70,6	20,0	28,4
Smallscale	66,6	55,0	11,6	21,0
Largescale	24,0	15,5	8,4	54,3
Mining and Quarrying	3,2	2,8	0,4	15,4
Manufacturing	26,1	20,7	5,5	26,4
Electricity and Water	5,0	2,6	2,4	89,9
Construction	11,2	5,0	6,2	123,3
Ownership of Dwellings	11,8	2,7	9,1	343,1
Distribution	43,8	38,6	5,2	13,5
Transport and Communication	15,7	9,6	6,1	63,1
Financial and Professional Services	21,9	16,3	5,6	34,5
Private Social and Community Services	26,6	3,9	22,7	578,4
Producers of Government Services	17,8	15,9	2,0	12,4
Unallocable Finance Charges (FISIM)	-14,4	-7,2	-7,2	100,9
GDP at Basic Prices	259,3	181,5	77,9	42,9
Taxes on production, customs duties	26,5	25,7	0,8	3,2
GDP at Market Prices	285,9	207,2	78,7	38,0

Source: National Statistical Office. Malawi

2.5. New GDP for Malawi by activity and by type of expenditure

Table 3. GDP by activity, million Kwacha and change in per cent. New estimates.

	Current prices			Volume change		Price change	
	2002	2003	2004	2003	2004	2003	2004
Agriculture	70535	77939	90581	3,9	2,8	6,4	13,0
Smallscale	51928	59721	66628	9,1	-1,5	5,4	13,2
Largescale	18608	18218	23953	-10,8	16,9	9,7	12,4
Mining and Quarying	1704	2686	3225	35,1	18,9	16,7	1,0
Manufacturing	20340	25857	26146	16,9	3,0	8,7	-1,8
Electricity and Water	3475	3773	5010	3,0	13,4	5,5	17,0
Construction	8673	9947	11214	1,1	3,0	13,4	9,5
Ownership of Dwellings	10010	11141	11773	2,7	2,4	8,4	3,2
Distribution	31701	33328	43797	2,3	11,4	2,7	18,0
Transport and Communication	12202	14282	15674	6,4	2,2	10,0	7,3
Financial and Professional Services	17357	19157	21923	2,2	5,8	8,0	8,2
Private Social and Community Services	16000	21083	26580	7,8	12,5	22,2	12,1
Producers of Government Services	11104	13328	17839	4,3	4,0	15,1	28,7
Unallocable Finance Charges (FISIM)	-8062	-11053	-14427	30,0	18,2	5,5	10,4
GDP at Basic Prices	195039	221467	259334	4,3	4,9	8,8	11,6
Taxes on production, customs duties	9343	14773	26536	34,4	12,7	17,6	59,3
GDP at Market Prices	204382	236240	285870	5,7	5,4	9,3	14,8

Source: National Statistical Office, Malawi

Table 3 shows the importance of Agriculture, in particular small-scale agriculture. Agricultural production is very dependent on rainfall, and the availability of inputs such as fertilizer. This is also important for the Household consumption figures shown in the next **Table 4.**

Table 4. GDP by expenditure, million Kwacha and change in per cent. New estimates.

	Current prices			Volume change		Price change	
	2002	2003	2004	2003	2004	2003	2004
Final consumption exp. Of HH and NPISHs	181181	208128	256154	2,4	4,6	12,2	17,6
Household final consumption expenditure	163929	187887	230931	2,9	4,0	11,4	18,2
NPISH final consumption expenditure	17252	20241	25223	-2,3	10,7	20,1	12,5
Government final consumption expenditure	17507	20544	29773	6,0	22,2	10,7	18,6
Gross fixed capital formation	27637	33403	46376	16,2	27,1	4,0	9,3
Dwellings	3112	3181	3343	-10,3	-8,6	14,0	15,0
Other buildings and construction	5168	6674	7347	8,6	-5,3	19,0	16,3
Transport Equipment	7197	9940	13402	33,3	17,1	3,6	15,1
Machinery	12160	13608	22145	16,2	57,7	-3,7	3,2
Changes in Inventories	5345	7003	5695	19,7	-29,9	9,5	16,0
Exports of goods and services	42517	63068	71353	37,0	4,2	8,3	8,6
Exports of goods	32102	52841	58014	53,0	1,8	7,6	7,8
Exports of services	10415	10227	13339	-12,1	16,5	11,8	11,9
Imports of Goods and Services	69805	95904	123480	21,5	11,4	13,1	15,5
Imports of Goods	58901	84164	111148	26,5	13,9	12,9	16,0
Imports of Services	10904	11740	12332	-5,8	-5,9	14,3	11,6
GDP at Market Prices	204382	236240	285870	5,7	5,4	9,3	14,8

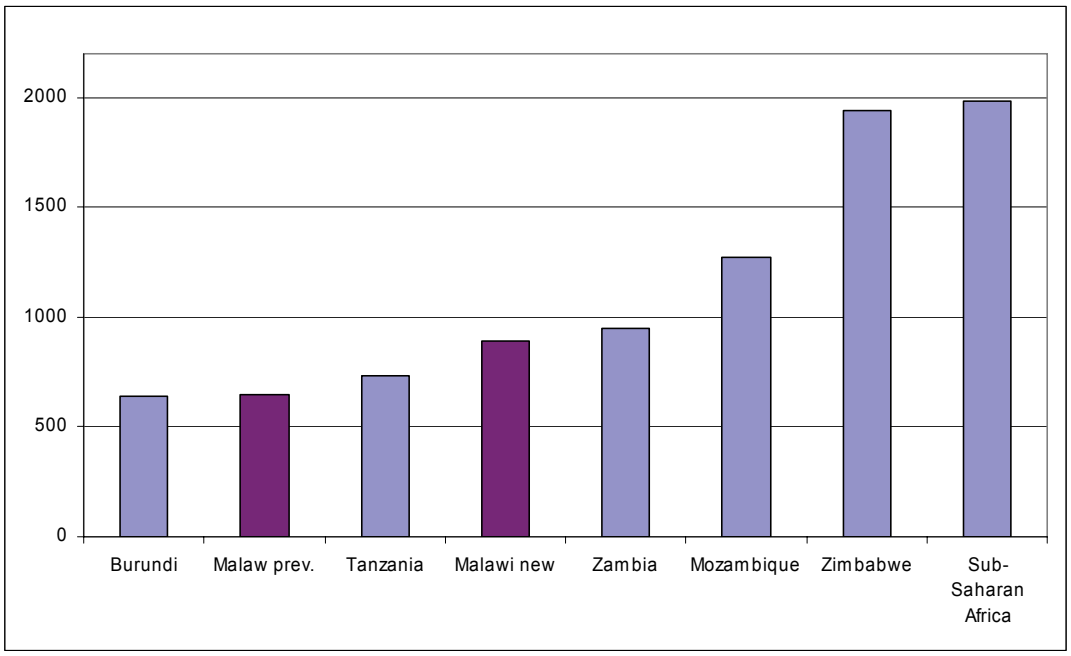
Source: National Statistical Office, Malawi

Table 4 shows GDP by expenditure at a more detailed level than before for Malawi. The table illustrates that in this low income economy Household final consumption expenditure represents a very large share of the gross domestic product (80%). **.**

2.6 International Comparability

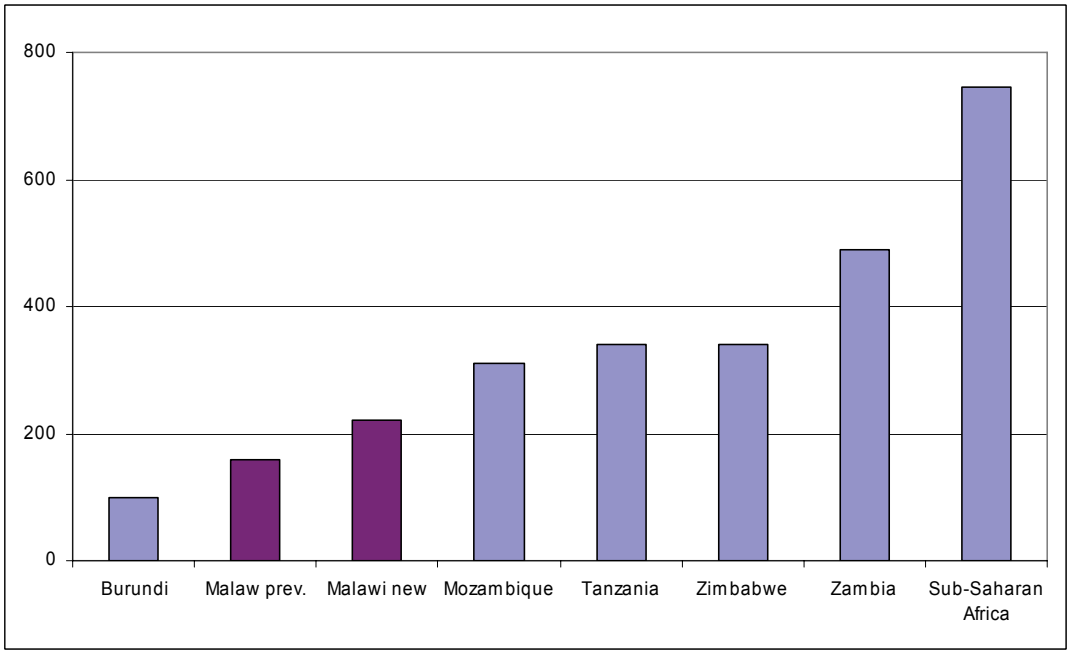
Figures 1 and 2 show GNI per capita for Malawi and her neighbouring countries.
The two figures give different results. According to Figure 1, which shows data adjusted for differences in the price levels, with 37,5 percentages upward revision of GDP and GNI for Malawi, GNI per capita for Malawi lies between Tanzania and Zambia.

Figure 1 GNI per capita 2005, PPP International dollars



Source: World Bank and own calculations

Figure 2 GNI per capita 2005, Atlas method US dollars



Source: World Bank and own calculations

According to Figure 2, which shows data based on market exchange rates, Malawi is still between Burundi and Mozambique, even after the upward revision.

Differences in compilation methods between countries in Africa will affect the international comparability of national accounts statistics. For Malawi underestimation of parts of the

economy gave a very low GDP and GNI. This can also be the case for many other developing countries.

2.7 The next milestones

During the year 2007 compilation of final National Accounts with SUT tables for the year 2005 has priority for the NA-BOP Branch in NSO. Both Supply Tables, Use Tables and Input Output Tables will be produced at a detailed level and at the aggregated level required for international reporting.

NSO is currently conducting a National Agriculture Census and Livestock (NACAL). When the results from the NACAL are ready with new, more complete data for the agriculture industry in the first quarter of 2008, the new data has to be included in the National Accounts/SUT tables for the year 2006. It can also be expected that the National Accounts tables/SUT for the years before 2006 will have to be revised.

Further development of other parts of the national accounts system is also planned.

The next milestones should be:

- Production and generation of income accounts for all the institutional sectors with a direct link between the sector accounts and the Supply and Use tables to ensure consistency between these two parts of the national accounting system.
- A full set of sector accounts for general government.
- The National Accounts rest of the world account, fully consistent with the IMF's BOP system (BPM5).
- Integrating SUT data and data compiled for some Institutional sectors in a SAM framework.

The indicators of the purposes fulfilled will be as follows: Sustainable capacity at NSO for operating and maintaining an improved national accounting system based on Supply and Use Tables integrated with the main parts of the Institutional Sector Accounts.

3. National accounts for Malawi

3.1. National Accounts for Malawi, The old tradition

National Accounts for Malawi was first calculated by Miss Pyllis Deane for the year 1938 and published in ”The Measurement of Colonial National Income”, Cambridge University Press, 1948. During the Federal period, from 1954 to 1963 a set of national accounts were prepared for Malawi by CSO, Salisbury. Following independence in 1964 the task of preparing National Accounts for Malawi fell on the newly established NSO, Zomba. The first National Accounts Publication for Malawi, covering the years 1964-1970 was released in November 1972 and followed by five others covering the period up to 1990. The last National Accounts publication “Malawi National Accounts Report 1990-1994” published by NSO, Zomba has series starting from 1990, using 1994 as base year.

NSO is responsible for the National Accounts compilation, but National Accounts figures for Malawi have also been published by the Reserve Bank of Malawi in “Financial and Economic

Review" and by the Ministry of Economic Planning and Development (MEPD) in the "Economic Report". Traditionally the national accounts work has been done in two rounds. NSO has been compiling the first version of the national accounts for a year. This preliminary version has been compared with data from the other stakeholders as Ministry of Economic Planning and Development, the Reserve Bank and information being available in Ministry of Finance through extensive collaboration. After a meeting of the "National Accounts and BOP Technical Committee " where the input from the other stakeholders is considered, NSO compiles and releases final National Accounts estimates.

The previous National Accounts for Malawi have been compiled using the production approach, based on the 1968 System of National Accounts and been periodically revised as data becomes available. The National Accounts for the years up to 2006 were compiled in 1994 prices, with only GDP converted to current price by an aggregated price index composed of consumer price indices and price indices from external trade.

3.2. The National Accounts and Balance of Payment Branch in NSO, Malawi.

3.2.1. Human resources

The National Statistical Office (NSO) of Malawi is located in Zomba. The National Accounts and Balance of Payment (NA-BOP) Branch was moved from Zomba to the capital Lilongwe in 2002. Malawi NSO has co-ordinated the national accounts and balance of payments work in one branch in the NSO, like countries as UK, Denmark and Norway.

The Chief statistician of the NA-BOP Branch is Ms. Lizzie Chikoti. In addition, during the project period from 2005 NA-BOP Branch has had between 5-7 statisticians with responsibilities for the different sectors and for Balance of Payments. They have had theoretical and practical "hands on training" in the compilation of National Accounts according to SNA 93 with Supply and Use Tables (SUT). This has given them a new or much better understanding of the National Accounts methodology and the data required for the SUT compilation.

The data requirements for developing and improving the National Accounts should play an important role in the further planning and development of economic statistics for Malawi.

3.2.2. Hardware and software situation.

The NSO had long experience using Excel spreadsheets. The introduction of the SNA93 with detailed compilation of SUT using new data sources and detailed classifications for industries and products required an efficient and partly automatic compilation methodology as have been introduced with the SNA-NT methodology and software.

Excel worksheets are used to prepare the input data. The computation of the complete SUT, the automatic product balancing, the constant price compilation and updating are conducted by the SNA-NT software. Preliminary and final results are extracted from SNA-NT to various Excel reports.

Major problems arising in the autumn 2006 with computers and Virus infections were solved from 2007 with a new desktop computer and a new laptop for the SUT work and an updated Anti virus program, financed by the Ministry of Finance.

4. The structure of the Supply and Use Tables.

4.1. System of National Accounts - Norwegian Technology (SNA-NT)

By the Norwegian methodology and SNA-NT software, a documented, verifiable and efficient set-up for compiling national accounts with integrated SUT and IOT in current and constant (previous years) prices has been introduced for Malawi.

4.2. The SUT framework for Malawi

The national accounts system described in the 1993 SNA, represents a comprehensive accounting system of economic activity. The frame for the benchmark SUT for Malawi for the first year 2002 has been considered carefully and in cooperation with users in the Government Ministries. When starting the SUT project in Malawi, the following classifications had to be established:

- *Industry codes NA-ISIC*
- *Types of final domestic expenditure, imports and exports*
- *Product codes NA-CPC*

The SNA-NT software is flexible concerning the classification to be used for compiling SUT and gives no restrictions concerning details. An important requirement is that the same industry classification and the same product classification are used both in the Supply Table and the Use Table. For reporting to international organisations a minimum format is required with a 60 classification for industries and products, and types of final expenditure as given by SNA93.

4.3. Classification of Industries in SUT

For Malawi it is important to distinguish "Producers for own final use" from “Market producers”. Non-market producers have been subdivided between "Producers of government services", and "Non profit institutions serving households" (NPISH’s).

The industry classification NA-ISIC introduced for the Malawian National Accounts with SUT is an aggregated version of ISIC-rev 3, with three-digit codes, specifying 110 industries. (Including a split between large and small enterprises).

4.4. Classification of Products in SUT

Important for the SUT project for Malawi was to define the most suitable product classification to be used. About 350 products, specified by six-digit NA-CPC codes, are defined. The NA-CPC products are linked to or are aggregates of the CPC-codes and also linked to the HS classification used in the External trade statistics.

One goal was to specify important food products in the Malawian economy and also with a split between products sold to the market and products for own use. Goods received as food aid are given special product codes. Another goal was that only one rate for product taxes and product subsidies apply to one type of use of the product. The product details are also important for the constant price compilation.

5. Economic Statistics used for the new National accounts for Malawi

5.1. Important economic statistics for SUT in current prices

Important statistics and administrative data sources used for the years 2002, 2003 and 2004 are:
Annual Economic Survey (AES) for about 350 large and a few medium enterprises; External trade statistics from the EUROTRACE system; Imports and exports of services from Balance of Payments estimates; Government budgets and accounts for the budget year 2001/2002, 2002/2003, 2003/2004 and 2004/2005; Integrated Household Survey (IHS1) for1998/99 and Integrated Household Survey (IHS2) for 2004/05; Consumer price indices.

5.2. Market production and Production for own use.

5.2.1. Agriculture, forestry and fishing

A detailed industry classification is introduced for the important primary industries. Agriculture, forestry and fishing sector is split between:

Production for own use with a breakdown by 3 industries:
Agriculture; Forestry, logging and related services; Fishing.

Market producers with a breakdown by 7 industries:
Large scale farming, tobacco; Large scale farming, tea growing;
Large scale farming, sugar growing; Other large scale companies: Smallholder farmers;
Forestry, logging and related services; Fishing.

The main data sources have been the Crop estimation survey, final Round and for large estates the AES. The Crop estimation survey specifies the results by type of estates (Large estates and Smallholder farmers) and gives estimates for volume produced and hectarage used. The Smallholder farmers are important in the production of maize, cassava, potatoes, fruits and vegetables. Their production has been split between production for own use and market production by using information from IHS 2.

Other data sources are: Tobacco Control Commission (TCC), Tea Association of Malawi, Illovo Sugar Company, Department of Fisheries, and Department of Forestry.

The last agricultural census was conducted back in 1992/3. Since then, there have been changed regulations between what used to be the estate sector and the smallholder sector. NSO is conducting a National Agriculture Census and Livestock (NACAL) in 2007, supported by the Norwegian Embassy. NACAL is the most reliable source of agriculture statistics, and revisions to the National Accounts series will be effected after the results are published.

5.2.2. Annual Economic Survey (AES)

The first Annual Economic Survey (AES) for the period 1973-1979 was published in May 1983 and since then there have been annual publications. The AES for the period 1999-2001 is the last AES survey which has been published.

Approximately 350 large-scale profit-making industries and a few medium-size industries have been selected on the basis of the industry employment size for AES for the years 2002, 2003 and 2004. Tables for the AES for these years became available as manuscripts during the project period and were important data sources for the SUT compilation. The data for large manufacturing industries from AES have been classified by 33 NA-ISIC industry groups to create as homogenous production units as possible.

The AES has information about turnover specified by type of income, current expenditure by type of expenditure, (sale and purchases of goods for resale, where relevant), employment, compensation of employees (wages) and acquisitions and disposals of fixed assets (capital investment) by type. For the SUT compilation, output and intermediate consumption expenditure have been specified by the NA-CPC products, giving details for the output and input structure for the different industries. Many of the companies had not specified the products produced and the products used in the questionnaires so a lot of estimation has been done based on the product information from the SUT balancing, mainly from import and export data.

5.2.3. The medium and small-scale business sector.

The last survey for Medium size business enterprises **(**representing 22361 enterprises) for the year 1998 have been used as a basis for estimating updated figures. The data collected in 1998 were inflated with the growth rate from similar activities from the AES from 1998 to the years 2002, 2003 and 2004. Corrections had to be made to the estimates, based on general knowledge of the economy. For some service industries, other data sources have been used. The weak data sources for medium and small-scale companies has been a problem that has required several corrections during the SUT balancing process. For small-scale companies or household enterprises, some data were found from the IHS-2 from 2004.

5.3. Non-market producers

5.3.1. Government services

For Malawi, the accounting year for the government accounts and budget is from 1st. July to 30. June the following year. Both government accounts and the more detailed budget data for two financial years have been used for calculating the national accounts figures for a calendar year. Detailed data have been made available from the Ministry of Finance. The calendar year is estimated as half of the first year and half of second year.

Government production and consumption are derived from these data. The value of the output of services from general government is calculated as the sum of the expenditure components: intermediate consumption and compensation of employees. On the output side, gross output is equal to the sum of the government fees (sales of goods and services) and government final consumption expenditure (the residual). Final consumption expenditure is specified by COFOG groups.

Figures for consumption of fixed capital for the government are not calculated, which gives an underestimation of government final consumption expenditure and GDP.

The government accounts are also data source for the different types of product taxes and product subsidies, VAT rates and other taxes and subsidies on production.

5.3.2. Non-profit Institutions Serving Households (NPISH).

International and national NPISHs have an important role in the Malawian economy. They cover activities as education, human health, social work, member organisations (charging membership fees) and recreational, cultural and sports organisations and clubs. Complete data for all the different religious and voluntary organisations are difficult to get.

The data sources used were:

- A mini survey conducted in 2004 collected information for 2002 and 2003. For 2003 more organisations were covered.
- Integrated Household Survey 2.
- Data from church, mission, Islamic schools for data on education, CHAM secretariat for data on human health.

Production and consumption is calculated from data for expenditures, wages and fees, in a similar way as for government. The COPNI classification is introduced at an aggregated level.

5.4. Import and export of goods and services

5.4.1. Import and export of goods

From 1995, NSO has been using the EUROTRACE application package, developed by EU's statistical office Eurostat, to compile the External trade statistics from the Customs. The statistics gives monthly reports of the value and quantity of imported and exported goods by type of good and by country. Imports are valued on a "cost, insurance and freight basis" (c.i.f.), and exports are valued "free on board" (f.o.b.). Data is classified by the Harmonized System (HS). The UN link between the HS classification and the CPC product classification is used for coding the detailed import and export data with the CPC codes and the aggregated NA-CPC codes used for SUT.

The External trade statistics have been used to compile price indices as unit value indices for exports and imports specified by NA-CPC product codes. The selection of representative HS commodities for compiling unit value indices, have been coordinated with the NA-CPC product classification.

Informal merchandise trade is important and some estimates are available and have been used. In addition to tobacco exports, maize, beans and rice are the three major traded commodities across the borders (both for imports and exports).

5.4.2. Imports and export of services

The figures for import and export of services are coordinated with the Balance of Payments (BoP) figures. The Reserve Bank has had problems with the quality of the information of import and export of services, but improvements are planned.

5.5. Household final consumption

In the previous national accounts estimates for Malawi, figures for household final consumption were estimated as a residual.

With the SUT framework, the basic sources for estimating household final consumption have been the “First Integrated Household Survey 1998/99” (IHS1) and the “Second Integrated Household Survey 2004/05” (IHS2). The details from IHS-1 and IHS 2 have been used for

the years 2002, 2003 and 2004 by adjusting with both the growth rate in the population and the consumer price indices. Quantity information on sales of beverages and tobacco is also used.

By introducing direct estimates for final consumption, followed by corrections at the product level during the balancing of products in the SUT framework, the quality of the figures for final consumption of households have been improved.

5.6. Custom duty, taxes and subsidies on products

5.6.1. Custom duty

The external trade statistics give figures for Custom duties and Excise duties specified by the HS classification. Custom duties are registered in the Supply Table as Supply from a Dummy Account, specified by NA-CPC products.

5.6.2. Surtax and VAT, Excise duty and other taxes and subsidies on products.

Information from the government accounts is used for identifying the different types of taxes/subsidies on products and other production taxes/subsidies. Surtax has been the main tax on products for Malawi for the years up to the budget year 2002/2003. From 2003/2004 the Surtax was changed to a Value Added Tax (VAT). For the year 2004 the general VAT rate (17.5 %) is included in the SUT compilation.

The External trade statistics gives a distribution of Excise duty on imports specified by imported HS products. These rates for Excise duty are used to distribute the total amount of Excise duty on domestic products and imports by NA-CPC products.

For subsidies on products, the total figure for each type of subsidy specified by product is allocated to products in the Use Table as Product subsidies.

6. Establishing the current price SUT

6.1. The compilation process for SUT in current prices

6.1.1. The Supply Table at producers' value.

The following input data are loaded into the SUT application in a fixed Excel format:

- Domestic production, specified by subgroups for Production for own use, Market production, Non market production and classified by 110 NA-ISIC industries and by NA-CPC products.
- Imports specified by NA-CPC products.
- Custom duty specified by NA-CPC products.

6.1.2. The Use Table at purchasers' value

The following input data are loaded into the SUT application in a fixed Excel format:

- Domestic intermediate consumption specified by NA-CPC products and by NA-ISIC industries.

- Domestic final consumption specified by NA-CPC products and by COICOP, COFOG, COPNI.
- Gross fixed capital formation specified by NA-CPC products, by capital type and by NA-ISIC industries.
- Exports specified by NA-CPC products.

6.1.3 The Use Table, trade margin matrix and tax matrices:

The following input data are loaded into the SUT application in a fixed Excel format:

- Matrices for trade margin rates and transport margin rates by products and users
- Matrices for VAT rates (or sales tax).
- Total figures for product taxes and product subsidies classified by product codes.

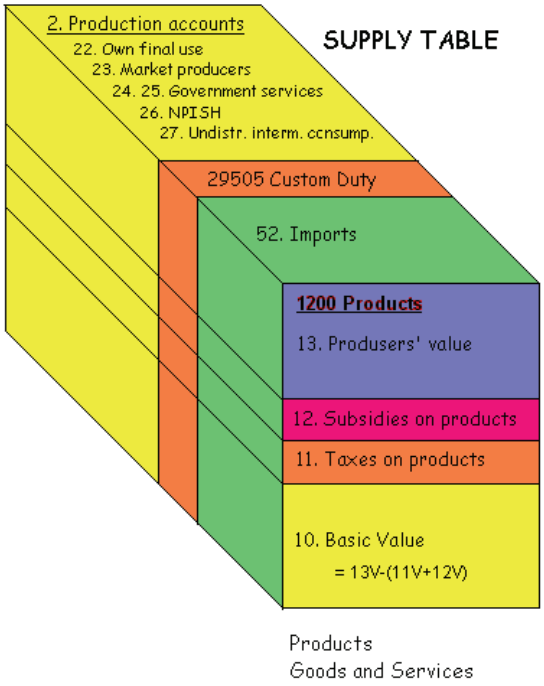
6.1.4 The Use Table in producers' value

After the Use Table has been established in purchasers' value, matrices for VAT or sales tax, trade margins, transport margins and producers' values are calculated for the Use Table to compile producers' value.

6.1.5 Balancing the Supply and Use Tables

The detailed SUT are balanced and corrected in producers' value. Preliminary residuals, recorded as Change in inventories are corrected, either manually or interactive. After the balancing of the Supply and Use Tables at producers' value, matrices for product taxes, product subsidies and basic values are calculated automatic both for the Supply Table and the Use Table. Finally both the Supply Table and the Use Table are calculated in basic value.

Overview of the Supply Table



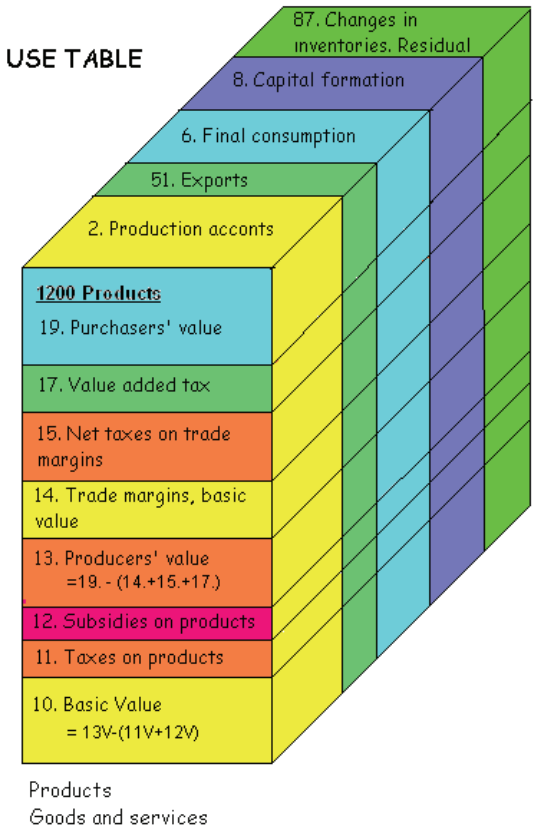
The Supply Table has four layers, corresponding to different valuation matrices:
10 Basic value
11 Taxes on products (paid by producers)
12 Subsidies on products (paid to producers)
13 Producers\ value

The Supply Table is first established and balanced in Producers' value (13 value).
By an automatic procedure:

- time adjusted taxes, allocated to products, are distributed between domestic suppliers and imports of the products.
- time adjusted subsidies, allocated to products, are distributed between domestic suppliers of the products.

Finally, the Supply Table is calculated in Basic value (10-value)

Overview of the Use Table



The Use table established in Purchasers' value is automatic decomposed into the relevant valuation matrices:

- Non-refundable VAT (Account type 17)
- Retail and wholesale margins, basic value (Account 14 R)
- Transport margins (Account type14T)
- Producers' value (Account type 13)

After the balancing between the Supply and Use Table, the producers' value is further decomposed into:

- Subsidies on products (Account type 12)
- Taxes on products (Account type 11)
- Basic value (Account type 10)

Balancing and correcting changes in inventories:
In the first phase of the balancing of the supply and use of each product at producers' values, the change in inventories is residually determined. The residuals are corrected to an acceptable level by changing the Supply or Use of a product. The corrections are first made manually, based on an evaluation of data and statistical sources and finally by an automatic "RAS" method.

6.2. Corrections.

During the process of balancing and correcting the SUT-tables for Malawi, the statisticians in the SUT team, responsible for the various industries or types of final use, had to check and correct their data.

Corrections can take place in different ways, either by loading an Excel file with absolute figures, with value indices or by interactive corrections. When a variable is changed, all dependent variables are recalculated automatically and instantly. Each round of corrections that are carried out results in a new automatic total balancing of the Supply Table and the Use Table in all types of valuation, giving new figures for change in inventories, specified by products.

6.3. A simplified "RAS" methodology for automatic balancing of residuals for services.

An automatic adjustment procedure (simple RAS) is used for final balancing of services where no change in inventories or residuals can be accepted. The starting point is a Use table where the Total for each User (e.g.Total intermediate consumption by industries) is assumed to be correct. The adjustment takes place in several automatic steps. The result is that the first automatic computed residuals for services will be redistributed and balanced. The final result will be all changes in inventories for services removed and revised figures for changes in inventories of goods.

6.4. Value added at basic value

Value added at basic value for each industry is calculated as a residual, defined as:
Total output at basic value minus Total intermediate input at purchasers' value. .

7. Update SUT to the years 2003 and 2004 in current and constant prices

7.1 Update in current prices

After having finalised the National Accounts with integrated SUT in current prices for Malawi for the first year 2002, the updating of SUT to the next years 2003 and 2004 was simplified. The SUT was first updated in current prices, followed by compilation in constant prices and final corrections in current prices.

For both 2003 and 2004 detailed data files with product information were used for imports, exports, government accounts and industries where new product information was known. For some large and all medium-size and small industries and for household consumption and other type of final use, value indices for totals were used.
For an industry, the value indices would give total output and total input. By an automatic routine, the complete Production accounts were compiled using the input and output coefficient in current prices from the previous year.
For final domestic use, the value indices would give totals by category, and by the automatic routine, the product composition was compiled based on the composition from the previous year. This automatic routine was followed by several rounds of corrections to balance supply and use of all products.

7.2. The constant price methodology

National Accounts/ SUT tables for Malawi have been calculated in constant prices by calculating SUT for 2003 in 2002 prices and SUT for 2004 in 2003 prices. The methodology with constant price compilation in previous year's prices and chain price indices is new for Malawi, but has been accepted since it is the recommended methodology in SNA93 and also for the European countries.

SNA-NT methodology for compilation of SUT in constant, previous year's prices

- The level of details in the balanced SUT in constant prices is similar to the level of details in current prices, and the definitional relationships inherent in the current price SUT are also maintained in the constant price SUT.
- Value added for the different industries in constant prices, are calculated as balancing items (double deflation).
- An integrated set of value, price and volume measures are compiled within the framework of detailed, annual SUT in current and constant, previous year's prices.

For the constant price compilation of the flows of products, 3 price indices (where relevant) are required for each NA-product to deflate corresponding current price figures:

- Price index for each NA-product supplied from domestic production (Basic value).
- Price index for each NA-product supplied from imports (Basic/CIF value).
- Price index for each NA-product delivered to Exports (Purchasers'/FOB value).

Methodology used for compiling trade and transport margin and tax rates in constant prices:

VAT, trade and transport margins and product taxes and product subsidies are compiled in constant prices for the detailed products by user categories, by applying tax rates and trade margins from the previous year.

7.3. Price indices and other data input

To prepare for the constant price compilation, price indices for all products and wage indices are registered in an "Assembling file". Up to 9 different price indices could have been registered for each product, but for Malawi the available price and volume indicators were restricted. The price indices used were proper price indices or implicit price indices compiled from value and volume indicators for agriculture products, unit value price indices for imports and exports, or input price indices.

The following direct or indirect compiled price indices are used for compiling SUT for Malawi in constant prices:

- Use Table, Exports at purchasers' value: Unit value price indices for goods to exports (FOB value) and consumer price indices for transport services to exports.
- Supply Table, Domestic production at basic value: Agriculture price indices, Consumer price indices for services, Unit value indices, Input price indices.
- Supply table, Imports at basic value: Unit value indices from foreign trade statistics and price information for capital goods and services.

7.4. Stages in the automatic compilation process:

1. Use Table. Exports in constant prices:
   - Exports, goods and services, fob /purchasers' value matrix is compiled in constant, previous year's prices by dividing the current price figures at purchasers' values with a set of price indices.
   - From Exports, purchasers' values matrix, trade margin matrix and other valuation matrices in constant prices are deducted.
   - Exports, basic value matrix is compiled in constant prices.

2. The Supply Table, basic value in constant prices:

Domestic production matrix at basic value and Imports matrix at basic value are compiled in constant, prices previous year's prices by dividing the current price figures at basic values with a set of price indices.

3. The balancing between Supply and Use Table at basic value in constant prices:

TOTALS by products for constant prices in the Use Table at basic values are fixed, identical with the compiled TOTALS (Domestic supply and Imports) from the Supply Table.

4. Constant price figures for domestic use at basic value:

The constant price figures for the different domestic use of a product at basic value are calculated as the difference between TOTAL supply of the product in constant prices and exports of the product in constant prices. The constant price figure for total domestic use of a product is distributed between the different domestic users of the product in the same proportion as the domestic use of the product in current prices. This implies that at basic value, the same price index is used to deflate all domestic use of a product.

Note: This ensures that the supply and use of each product in constant prices will balance at basic values.

5. Compiling the complete Use Table in constant prices:

Constant price figures for trade and transport margins, VAT, product taxes and product subsidies are calculated, specified by products and users, as a supplement to the basic values in order to compile a complete Use Table in constant prices. Tax rates and trade margins from the previous year are used to compile margins, VAT, product taxes and product subsidies in constant prices.

6. Compiling the complete Supply Table in constant prices

The product taxes and the product subsidies in constant prices are calculated in the Supply Table by using the "basic rates" from year t-1.

7. Correction of household consumption with the consumer price indices

The constant price figure for the NA-product delivered to Household final consumption at Purchasers' value is, in a final stage, corrected by deflating with the consumer price indices. A revised constant price matrix for household final consumption of goods in purchasers' values, leads to a revision of the valuation matrices and the constant price matrix for household consumption in basic values.
By an interactive connection between the constant price SUT and the current price SUT, the estimated trade margins in current prices are changed so the current price figure for household

consumption in purchasers' values is kept unchanged. This leads to a new interactive balancing of the Supply and Use table in current prices, with adjusted figures for change in inventories in both current and constant prices.

7.5. Value added and gross domestic product in constant prices

Value added in constant prices for all industries are finally calculated by double deflation. GDP in constant prices is calculated by adding product taxes minus product subsidies to gross value added at basic values.

7.6. Correction of SUT in constant prices

Corrections of the SUT can only be carried through by correcting current price values or by selecting other price indices for the constant price compilation, not by correcting the constant price figures directly.

8. Input-Output Tables in current and constant prices.

The SNA-NT software contains procedures for automatic converting the Supply table (Suppliers x Products) and the Use table (Products x Users), at basic value, to an "Industry format" Input-Output table (IOT) by distributing the supply and use of products. For each product, domestic use of the product (intermediate consumption, final consumption, capital formation, changes in inventories) and exports will be linked directly both to the domestic suppliers (industries) of the product and to import of the product.

The principle is the assumption that export of a product primarily is supplied from domestic industries. Distribution of the exports of a product by supplying industries, are assumed proportional to the different industries supply of the product. Imports, custom duty and the remaining part of the domestic supply of the product is then subsequently distributed proportional to the different domestic users of the product. This means that the same import share applies to all domestic use categories of a product, and that all industries that supply a product, have the same market share for all types of use of that product.

The IOT are comparable to the current national accounts data for production, value added, capital formation etc. and to basic statistics in general.

In the SUT, imports are distributed by the NA-CPC product classification and not by an industry classification. In the IOT tables, imports distributed by the product classification will also be allocated to the same NA-ISIC industry classification that is used for domestically produced products.

In the IOT tables, import are split into the two main categories:" Imports of competitive products" and" Import of non-competitive products", and further reclassified from the NA-CPC product classification to the NA-ISIC industry classification used for domestic production.

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