

PAN AFRICAN STATISTICS PROGRAMME

BASICS ON GDP COMPILATION IN AFRICA

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*Manual on basics
for the compilation of GDP
for countries in Africa*

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1.

Purpose of this document

National Accounts are an apex framework for recording the economic activities of a country in full scope, including even illegal activities. They have a leading role for steering and designing economic statistics at large: definitions and classification of statistical units, defining the most relevant variables and valuation concepts in economic statistics, determining the lead classifications like ISIC, CPC, COICOP etc., developing methods and tools like SUT, setting the frame for consumer price indices and for producer price statistics. Undisputedly, National Accounts are the genuine tool for making the economic statistics commensurate, plausible, and meaningful, enabling them to constitute a comprehensive and redundancy-free “system” of economic statistics which deserves this name. This lead role goes even beyond the core of economic statistics and includes neighbouring domains such as labour accounting, National Health Accounts, Social Accounting Matrices and satellite accounts of tourism, environment accounting etc. A history of the National Accounts – in general as well as for the African countries – is given in annex 12.1. The changes of the SNA 2008 over the SNA 1993 are summarized in annex 12.2.

Developing the National Accounts for the African Union’s Member States needs to customize them within the international frame set by the SNA 2008. But the SNA is full of suggestions for coping with problems of the OECD countries which in the developing world are minor ones, while – vice versa – it is not very outspoken about recording development aid or remittances which in Africa are quite important issues.

Given this context, good quality of National Accounts (among others: implementation of 2008 SNA) is key and imperative for developing the African Statistical System (ASS). But the complexity of National Accounts requires tackling the special situation in the African countries within the overall context of the SNA, resulting in a customized manual. The process of producing this manual and of keeping it updated shall motivate countries to reflect and to consider their own practices and to strive for harmonization of the methods with others. Overall, the design and developing of this methodology shall trigger and foster fruitful discussions of methods and best practices, going hand in hand with raising awareness of harmonization needs and with capacity building in the domain of National Accounts.

Wherever it is necessary to refer to the System of National Accounts, the manual is considered as an abbreviated and customized rephrase of it for the purpose of guidance, not deviating in concepts, definitions or any kind of substance from it. It shall be a living document, any enhancements and changes to be submitted to those who have a stake in its production and its utilization: National Statistical Institutes (or other compilers of National Accounts) in the countries, training institutes, Pan-African Institutions. It is designed as a tool for compilation of National Accounts in Africa. The custodianship for this manual lies with STATAFRIC, the statistical institute of the African Union.

The manual does not tackle SNA components which for the time being are considered less relevant for most of the African countries:

- capital stock calculations,
- the compilation of the institutional sector accounts and the balance sheets,

Some topics like the compilation of chain indices for volume measures are also not practiced in Africa (unless Mauritius and the ERETES countries mentioned in section 2.8) and therefore are covered only briefly.

Hence, the manual mainly tackles the calculation of the GDP and its components. There are African countries which go far beyond. But they are considered advanced enough to navigate through the respective international guidelines and recommendations without an Africa-specific manual.

As a by-product, the manual shall create and foster awareness about NA’s role within the African Statistical System and the links of consistency to other macro-economic frameworks like the Balance of Payments or the Government Finance Statistics.

2.

Basics of organizing National Accounts

2.1. Approaches to GDP calculation

In international analyses and comparisons, the Gross Domestic Product (GDP) is the most important and most common macro-economic indicator. As a measure of aggregated production, it is the sum of the gross value added of all resident producers at basic prices plus any taxes (less subsidies) on the products. For short: GDP represents the results of the production activity of resident producer units. It measures the contribution to output made by each producer. It is obtained by deducting from the total value of its output the value of goods and services it has purchased from other producers and used up in producing its own output.

THREE APPROACHES TO GDP

Production approach or “output approach” (aggregating GVA by industrial origin)

Income approach (aggregating all types of primary income distributed in the economy)

Expenditure approach (by type of expenditure and sector)

GDP is also equal to the market value of all final uses of goods and services during a year. This approach looks at final consumption expenditures of households, of non-profit institutions serving households and of the general government sector, at capital formation and at the net of exports minus imports.

Finally, GDP is also equal to the sum of primary incomes (payables out of the value added created by production) distributed by resident producers. In this approach, consideration is given to the costs incurred by the producer within his, her or its own operation, the income paid out to employees, taxes (less subsidies) on production, consumption of fixed capital, and the operating surplus. All these add up to GDP.

GDP may be measured in national or in foreign currency (e.g. US\$) or in Purchasing Power Parities¹. It may be measured in prices of the reference year (“current prices”) or in prices of a foregone year (“constant prices”).

For GDP estimation by activities (current & constant prices), the production approach is applied. For some activities, especially for non-market activities, output is measured as the sum of primary incomes (GVA) and intermediate consumption. This is commonly – and confusingly – also called “income approach”, though for parts of GDP, only.

WHY “GROSS”, WHY “DOMESTIC”?

“**Gross**”: consumption of fixed capital is not yet deducted. But calculation a net domestic product is not common, anyway.

“**Domestic**” means that economic activity of residents outside the country are not included while activity of foreigners inside the country is.

Many countries also apply the expenditure approach independently from the production approach. If so, this automatically leads to a discrepancy between the two approaches. Some countries explicitly show this discrepancy in their publications, perceiving it as a quality indicator for the accuracy of their compilation. Others combine this discrepancy with aggregates on the expenditure side, e.g. household consumption (because it is the biggest one) or with “changes in inventories” (because it is the most volatile and least observed one), so that both calculations of GDP (expenditure side as well as production side) perfectly match.

IDENTITY OF THE THREE APPROACHES TO GDP A MIRACLE?

Economists commonly use the terms “supply” and “demand”. They say that the economy has achieved “equilibrium” when supply matches demand. At first glance it looks unbelievable that in SNA the expenditure approach of calculating GDP always yields the same figure as the production approach. Is there an unrealistic “built-in” equilibrium? The answer is simple as the equation

GDP = final consumption + gross capital formation + net exports

is a tautology since gross capital formation includes changes in inventories. If producers face market imbalances and cannot get rid of their products then their inventories will increase, and vice versa.

Thus, “gross capital formation” and “gross fixed capital formation” must not be confused. They differ by the changes in inventories. Consequently, the SNA avoids the term “demand” in this regard. It instead speaks of “uses”.

A discrepancy between both sides does not emerge when GDP calculation is based on Supply and Use Tables (SUT) because any imbalances between supply and uses have already been sorted out during SUT compilation.

GDP from the income side is rarely compiled in developing countries (unless in ERETES countries where the compilation of GDP from the income side is integral part of the software), and it is not recommendable to begin with it. The reason is that the incomes to be measured must be those accruing from production and therefore require producers which are able to respond to economic surveys with specific questions to the components of their operating surplus. Usually, the response quality of economic surveys is much better (and the response burden much lower) for questions regarding output and intermediate consumption. And the main analytical interest is directed towards the “growth” of the economy in its segregation by economic activities.

The SNA foresees two major ways to sub-classify the economy. One of them is by the above-mentioned ISIC classification of economic activities. The other one is by the institutional sectors of the SNA: non-financial corporations, financial corporations, general government, households, and non-profit institutions serving households. In Africa, only few countries are compiling the institutional sector

(1) For explanation of PPP see Annex 12.5. Most African countries are participating in the International Price Comparison Programme.

accounts. They are the advanced ones, presumably not in the need of a paraphrased methodology like this one. Consequently, tackling the compilation of the sector accounts has been omitted here. But for delineating the expenditure categories households and general government and NPISH are involved in, it has been deemed necessary to tackle the specifics of these sectors in separate chapters.

2.2. Rebasing / revisions

National Accounts mainly aim at time-series monitoring economic growth and structural changes of the economy. Observing the performance of the economy and its main macro-economic variables requires fairly long time-series of data which are comparable to those of other countries. Thus, changing the methods and concepts and – because of it – even changing figures of past years already published annoy the users. Therefore, it is common international practice for National Accounts to keep the methods, concepts and definitions of the respective figures constant over time and space. But there is a conflict of goals: updating concepts, methods, classifications, and data sources versus stability of time-series. The common solution is stalling necessary updates and implementing them after five to ten years as a bundled exercise called “rebasing” or “revision”. The revision period is not fixed. The SNA gives a general recommendation, only.²

The terms “rebasing” and “revisions” are used synonymously. A rebasing is not necessarily linked with revisions of concepts, methods and classifications, albeit in most cases it is. There are two reasons that among the statistical offices the term “rebasing” is more popular than “revision”:

i. “revision” in the sense of rebasing (“big revision”) may be confused with the annual revisions during the regular compilation cycle maturing within several months from “preliminary” to “final figures”.

ii. “rebasing” sounds more technical and can – in contrast to “revision” – not be misunderstood as a process of cleaning faulty figures the statisticians have to be blamed for.

The SNA does not use the term “rebasing”.

Rebasings / revisions usually have four major components:

- new data sources, e.g. industrial census or surveys or new secondary sources
- new price basis, e.g. of the Consumer Price Index (CPI) or the Producer Price Indices (PPI)
- new concepts (possibly motivated by changes in the System of National Accounts)
- changes in classifications.

The most important component of each rebasing is to implement as far as possible the latest changes in the internationally agreed System of National Accounts, released by United Nations, IMF, World Bank, OECD, and Eurostat. Each new SNA requires a rebasing or revision, but a rebasing may as well be made between two versions of the SNA.

Classifications may be internal to the SNA, such as classifications of transactions or assets or sectors. They will only change when a rebasing is made for implementing a new vintage of the SNA. External classifications may be implemented or updated, also. External classifications are those which do not only apply to National Accounts but also to economic or social statistics at large, and hence are internationally agreed outside the SNA context and not necessarily at the same time when the SNA is revised. For the National Accounts, the most important ones are the classifications of economic activities³, of products⁴, of imports and exports of goods⁵, of household consumption⁶ or of the functions of the government.⁷

Each revision has a certain base year. The base year is the start year for the compilation according to concepts, classifications and methods which remain unchanged from that year onward. The base year is not necessarily the start year of long time-series. Statistical offices often also provide time-series prior to the base year by using

splicing techniques⁸, possibly combined with bridge tables between subsequent releases of classifications. In case of changes of concepts, definitions or methods, often global coefficients or reinterpolations are used for the back-casting to satisfy the users’ needs for long time-series.

Revisions of the National Accounts are to be planned well ahead, often influencing the work plans of economic statistics and the periodicity of censuses and surveys, ensuring that they cover the base year to the possible utmost. Hence, for the years succeeding the base year, the data sources might be less opulent than in the base year. In these cases, National Accounts utilizes factors, ratios and keys for extrapolating the figures of the base year forward. One common practice is to have proxies for extrapolating output and then to apply input-output ratios which stem from the base year. Another common practice is to apply constant growth rates delineated from two subsequent censuses or surveys, e.g. the inter-census growth rate of housing activities like services of owner-occupied dwellings. The proxies and ratios cannot be applied for a long time. Therefore, it is one of the main issues of a rebasing to review them.

Moreover, revisions may also replace terms which had been well embedded in old meta data. An example may illustrate this: The Balance of Payments Manual BPM 3 from 1961 differed between factor services and non-factor services and subsumed foreign incomes from labour and capital (the incomes on factor services) under services and hence under exports. The National Accounts according to SNA 1968 had to modify the trade figures in order to allocate the factor incomes correctly to the other kinds of income and confine the imports and exports of services to the “non-factor” ones. The SNA 1993 already brought harmonization with the then BOP Manual 5. This has been continued with SNA 2008 and BOP Manual 6. Nevertheless, some countries still used the term “non-factor services” which meanwhile is totally outdated.

2.3. “Constant” prices with a fixed base year

All countries in Africa are compiling National Accounts aggregates at current and at constant prices⁹. Most of them still use the option to have fixed base year rather than using chaining, the method now favoured by the SNA¹⁰. The aggregates at constant prices provide important indicators for measuring growth in the activity or economy. Constant price estimates use the price relatives of the respective base year to weigh together the volume components. The chosen base year gives a special perspective resulting from those weights. Over time, the pattern of relative prices in the base period tends to become progressively less relevant. Therefore, it is necessary to update the base period to adopt weights that are more consistent with current conditions.

But the base year for the National Accounts and the base year for price indices such as the CPI or the producer price indices are not necessarily the same. For reasons of balancing statistical workload over the years, it can even be useful to conduct a household budget survey – usually the source for rebasing the CPI – prior to the base year of the National Accounts which statistically may already be a busy one. For practical reasons, it could be useful then to transpose – by simple arithmetic – the index numbers of CPI or PPI to a series customized for internal use of the National Accounts with “100” for the base year of the rebasing of the National Accounts. In the meta data, it should then be mentioned that the fixed base year for the constant price figures of the National Accounts is the same as the year of the rebasing but not the base year of the CPI, or PPI respectively, the most important sources for the constant price estimates.¹¹

(2) SNA 2008, par. 18.12: “Each statistical office must make judgements about how to balance these conflicting demands but whatever the ultimate conclusion, time series that are consistent over time and explanations to enable analysts to appreciate the trade-offs the statistical office has to take are essential.”

(3) Its latest version is the United Nations’ “International Standard Industrial Classification of all Activities” (ISIC), revision 4. Web reference: <http://unstats.un.org/unsd/class/default.asp>

(4) Central Product Classification (CPC) Version 2. Department of Economic and Social Affairs, Statistics Division, Statistical papers, Series M, No 77, Ver. 2. United Nations, New York 2008. Web reference: <http://unstats.un.org/unsd/class/default.asp>

(5) Harmonized System (HS): World Customs Organization. 2007. Harmonized Commodity Description and Coding System, Revision 4 Brussels. Web reference: <http://publications.wcoomd.org/index.php>

(6) Classification of individual consumption according to purpose (COICOP), Statistical papers, Series M, No 84. United Nations, New York. Web reference: <http://unstats.un.org/unsd/class/default.asp>

(7) Classification of the functions of government (COFOG)

(8) It means that the backward extension of the time-series will be done by applying the growth rates of the old system but starting backward from the level of the oldest year of the new time-series.

(9) In the SNA, the term “constant prices” is not used anymore. But the term is still deeply embedded in common parlour among the compilers and the users of National Accounts. Prices vary over time and are not “constant”, of course. But the term means that the prices of a fixed base year are used as yardstick for the valuation of goods and services for the whole time-series (as if inflation or deflation did not happen since then).

(10) For short, chaining means to change the base year permanently every year. For more details, see section SNA 15.36 ff. Presently, only few countries in Africa have chosen this option. One of them is Mauritius. Therefore, this manual deals with it only briefly (see 8.4).

(11) Such a hint may be considered over-sophisticated. It may be given only when the meta data are outlined in deep detail and for experienced users.

2.4. Valuation and the price concepts

The SNA 2008 as well as its predecessor, SNA 1993, recommend applying basic price valuation for output and value added. While “factor cost” (a former but meanwhile

outdated price concept) means to value output without any indirect taxes but including subsidies, the basic price concept differs between (indirect) taxes on the products as such (e.g. varying with the output) and subsidies, respectively, and those taxes (less subsidies) which are levied on the production process as such (e.g. taxes on the production factors such as land or vehicles or on business permits).

TAXES ON PRODUCTS VERSUS TAXES ON PRODUCTION

	Taxes on products	Taxes on production
SNA transaction codes	D21 Taxes on products D211 Value added type taxes (VAT) D212 Taxes and duties on imports excluding VAT D2121 Import duties D2122 Taxes on imports excluding VAT and duties D213 Export taxes D214 Taxes on products except VAT, import and export taxes	D29 Other taxes on production
Character	Tax burden varies with the output	Tax burden is independent from output
Examples	Value added tax Sales tax Excise duties, e.g. on fuel or tobacco products	Value added tax Sales tax Excise duties, e.g. on fuel or tobacco products
Codes in the Government Finance Statistics Manual	114 Taxes on goods and services 115 Taxes on international trade and transactions	112 Taxes on payroll and workforce 113 Taxes on property

The producer sees such taxes as an element of cost. But they are not intermediate consumption. They are to be paid out of the producers’ value added. Hence, the difference between total of gross value added and GDP is D.21 (less subsidies on the products) and not D.29.

The basic price is the price the producer gets on his output excluding any taxes on the products and including any subsidies on the products. Thus, it is the price which is the proper economic reward for the output of the enterprise and the one which it will consider for decisions about extending or reducing it.

It should be noted that, according to the SNA, subsidies on the products also cover payments of the government to its public corporation which are meant for compensating for persistent losses. The different price concepts in equation form are as under

Factor cost
+ **taxes (less subsidies) on production (e.g. on land, vehicles)**
= **basic prices**
+ **taxes (less subsidies) on products (e.g. excise duties)**
= **producers’ prices**
+ **trade and transport margins + non-deductible VAT**
= **purchaser’s prices**

THE ECONOMIC MEANING BEHIND THE BASIC PRICE

When output is recorded at basic prices, any tax on the product payable by its producer is treated as if it were paid by the purchaser directly to the government instead of being an integral part of the price paid to the producer.

Conversely, any subsidy on the product is treated as if it were received directly by the purchaser and not the producer. The basic price measures the amount retained by the producer and is, therefore, the price most relevant for the producer’s decision taking.

Moreover, the costs of transport (if separately invoiced) and the trade margins form part of the purchaser’s price to be borne by the customer. They are excluded from the basic price. The rationale is that they are not relevant for the producer of the good.

The aggregates of intermediate and of final consumption are measured at purchasers’ prices. A fictive example may illustrate this with figures in million local currency:

“United Tobacco” is the only producer of cigarettes in the country. Its costs for tobacco and other material inputs are 20, the wages and salaries 10. The federal government imposes tobacco tax on cigarettes which in total are 90 and to be paid by “United Tobacco” directly. Moreover, the federal government imposes a (cumulated) sales tax on all sales of non-agricultural goods of 4 %. The sales of “United Tobacco” to wholesalers are 150 net of sales tax and 156 including sales tax. Wholesalers sell to retailers in amount of 180 net of sales tax and 187.2 including sales tax. Changes in inventories and imports of cigarettes neglected¹², the smokers in total pay 220 plus 8.8 as sales tax. The variables in quest are as under:

Row	Value	Amount
1	Operating surplus of “United Tobacco”, 150-90-20-10	30
2	Output “United Tobacco” at factor cost, 30+10+20	60
3	GVA “United Tobacco” at factor cost, 30+10	40
4	Output “United Tobacco” at basic prices, 30+10+20	60
5	Taxes on products tobacco industry, 90+6	96
6	GVA at basic prices “United Tobacco”, 30+10	40
7	Purchases wholesalers at purchasers’ prices	156
8	Output wholesalers (trade margin) at basic prices, 180-156	24
9	Taxes on products wholesalers, 187.2-180	7.2
10	GVA at basic prices wholesalers (assumption: IC is 10), 24-10	14
11	Purchases retailers at purchasers’ prices	187.2
12	Output retailers (trade margin) at basic prices, 220-187.2	32.8
13	Taxes on products retailers, 228.8-220	8.8
14	GVA at basic prices retailers (assumption: IC is 10), 32.8-10	22.8
15	Purchases smokers at purchasers’ prices	228.8
16	Total of GVA at basic prices, rows 6+10+14 or 40+14+22.8	76.8
17	Total of taxes on products, rows 5+9+13 or 96+7.2+8.8	112
18	GDP production side, rows 16+17 or 76.8 + 112	188.8
19	GDP expenditure	228.8

(12) If there would also be imports, the taxes and the duties on the imports would be part of the purchasers’ values, either squeezing the trade margin of the traders or, if not traders, enhancing the intermediate consumption of the producers importing these goods. Hence, like any other taxes on the products, the ones on the imports are to be added when calculating GDP as the total of GVA of the industries.

In this example, GDP expenditures (row 19) differs from GDP production (row 18) by 40 which is the equivalent for the total intermediate consumption of goods and services received by the tobacco producers and by the traders from the non-tobacco industries. If their GVA and the one of their providers etc. would be included, both sides of GDP would match.

About subsidies, it should be noted that often the industry receiving the subsidy is not identical with the industry the subsidy is aiming at. This is especially true for African countries where support to farmers are usually achieved by subsidizing the producers of farm inputs like fertilizers or pesticides. In the production figures of the NA, this kind of subsidy would appear under manufacturing and not under agriculture.

2.5. SNA and the milestones beyond GDP calculation

While the concepts and methods of National Accounts are internationally well harmonized, the degree of implementing the various components of the SNA is not. In order to streamline the countries' efforts of enhancing their National Accounts and to specify its recommendations, the Intersecretariat Working Group on National Accounts (ISWGNA) has developed so-called "milestones" which may be achieved by the countries one after the other.¹³ The milestones represent the six phases for full implementation of the SNA, the last ones being achieved by only few OECD countries. A country has reached a particular milestone when it is able to produce a combination of key tables, defined for each milestone. The milestones have been adopted by the United Nation's Statistical Commission in 2011 and are published as "Guidelines for monitoring the 2008 SNA implementation"¹⁴.

In setting priorities in launching the SNA 2008, developing countries may find guidance in these milestones. Such a list had already been developed for the 1993 SNA and has then been updated for the 2008 version. The milestones themselves are neither part of SNA 1993 nor of SNA 2008. For a quick overview, they are listed opposite:

PRE-SNA PHASES

1. Basic indicators of GDP

final expenditures on GDP, current and constant prices
GDP by industry at current and constant prices

2. Gross national income and other primary indicators for rest of the world

External account of primary incomes and current transfers
Capital and financial accounts

3. Institutional sector accounts: first step:

for all institutional sectors: Production account
for general government
Generation of income,
Allocation of primary income,
Secondary distribution income,
Use of disposable income,
Capital and financial accounts

4. Institutional sector accounts: intermediate step 1:

for all institutional sectors
Generation of income
Allocation of primary income
Secondary distribution of income
Use of disposable income
Capital accounts

5. Institutional sector accounts: intermediate step 2:

for all institutional sectors
Financial account

6. Institutional sector accounts: final step:

for all institutional sectors
Other changes in assets account
Balance sheet

The pre-SNA-phases are to be understood as the provision of basic data on production, turnover, consumption, investment, exports and imports, the compilation of consumer and producer price indices and the availability of the goods and services account of the balance of payments and of monetary survey statistics. Some developing countries may even have difficulties to ensure that all sources mentioned here are available. Producer price indices, for example, are lacking in many African developing countries.

Most African countries, however, should be able to achieve milestone 1 (GDP) and 2 (GNI). The approach of the countries of the ERETES community¹⁵ will presumably be broader as the ERETES software forces to specify during data entry, already, not only the transactions but also the sectoring. Thus, the ERETES countries will try to reach milestones 1 to 4 almost simultaneously.

The list of milestones may illustrate that countries should be very specific in describing their state of art in National Accounts. They should use the milestones as a yardstick rather than claiming that they have implemented or will implement "the" SNA 2008.

Once milestone 1 (GDP) is achieved, milestone 2 (GNI) may follow soon. As mentioned above, GDP can be calculated and understood as the sum of all primary incomes stemming from domestic production. The taxes (less subsidies) on production then are to be interpreted as primary income distributed to the government. If GDP is enhanced by the net primary income from abroad, then the result is Gross National Income (GNI). Depending on these net primary incomes from abroad (to be found in the country's balance of payments), GNI can be higher or lower than GDP.

In their National Accounts, most African countries do not go beyond GDP and GNI. For the calculation of (national) saving, it needs the figure of the country's national disposable income, presupposing meaningful institutional sector accounts. Under the limitations of having macro-economic aggregates just for GDP from the expenditure side, it is only possible to calculate gross domestic saving by subtracting final consumption expenditures from the GDP. Final consumption is made up of final consumption expenditures of households, general government and non-profit institutions serving households (NPISH).

For this manual, milestone 1 is the most relevant one. This milestone is achieved when basic indicators of GDP, final expenditures on GDP at current and constant prices and GDP by industry at current and constant prices are accomplished. As "complementary data systems" under milestone 1, the ISWGNA recommends supply and use table worksheets, balance of payments (current, capital and financial accounts) and Government Finance Statistics (GFS) as far as relevant for the transaction accounts.

Milestone 2 is dedicated to the compilation of GNI and other primary indicators for the rest of the world, to the external account of primary incomes and current transfers and to the compilation of the capital and the financial accounts.

GNI can be interpreted as the income of the population resident in the country and thus including compensation of employees working abroad for less than a year and including net property incomes (dividends, interest and the like) flowing into the country. However, GNI must not be confused with the disposable income. GNI does not include current transfers made or received by households to or from households of other countries. In the context of remittances, such current transfers are often referred to as "personal transfers."¹⁶

From the descriptions given for milestones 1 and 2, it becomes evident that the ISWGNA-members presuppose that the National Accounts are to be developed in close context with the country's GFS and its BOP and hence in close cooperation with the central banks which in most countries are responsible for the BOP and for the financial accounts under the SNA. Moreover, any plans for enhancing and improving the National Accounts should consider the respective requirements outlined in the various data dissemination standards developed by the IMF.¹⁷

2.6. SUT as a special tool for GDP compilation

Since the last ten to fifteen years, more and more countries tend to use a Supply and Use Table (SUT) directly for the compilation of their GDP. In former years, SUTs had been constructed just as a pre-step for calculating input-output tables, often even only at multi-annual intervals. In Africa, many countries are using the ERETES software or similar tools which, in principle, are based on SUTs (see also section 2.8).

The inner logic of the spreadsheet underlying the SUT supports checking the consistency of data, as well as the overall consistency of the complete data set during data entry. The supply table describes the supply of goods and services either produced in domestic industries or imported and the transition from basic prices to the purchasers' prices of the products. The use table shows where and how they are used in the economy, be it for intermediate consumption or for final uses such as final consumption, capital formation, or exports.

(13) The ISWGNA is one of the oldest interagency bodies set up by the United Nations Statistical Commission (UNSC) to enhance cooperation among international organisations working in the same field. Since the early 1980s, it has had the following five members: Eurostat, IMF, OECD, World Bank and United Nation. It has developed the two versions of the SNA since then, the SNA 1993 and the SNA 2008. The ISWGNA can be seen as the custodian of the SNA since the eighties of the foregone century.

(14) Guidelines for monitoring the 2008 SNA implementation Extract of the report of the Intersecretariat Working Group on National Accounts to the forty second session (2011) of the United Nations Statistical Commission. Web reference: <https://unstats.un.org/unsd/nationalaccount/docs/guidelines.pdf>

(15) For explanation of ERETES, see section 2.8

(16) The term "personal transfers" replaces "workers' remittances" (Balance of Payments Manual BPM 5 and SNA 1993). According to BPM5, workers' remittances were current transfers by migrants who are employed in new economies and considered residents there.

(17) For more details see <https://www.imf.org/en/About/Factsheets/Sheets/2016/07/27/15/45/Standards-for-Data-Dissemination>

Conceptually, the SUT maps the “supply” of products to its “uses”. The main concept of the SUT is as follows:

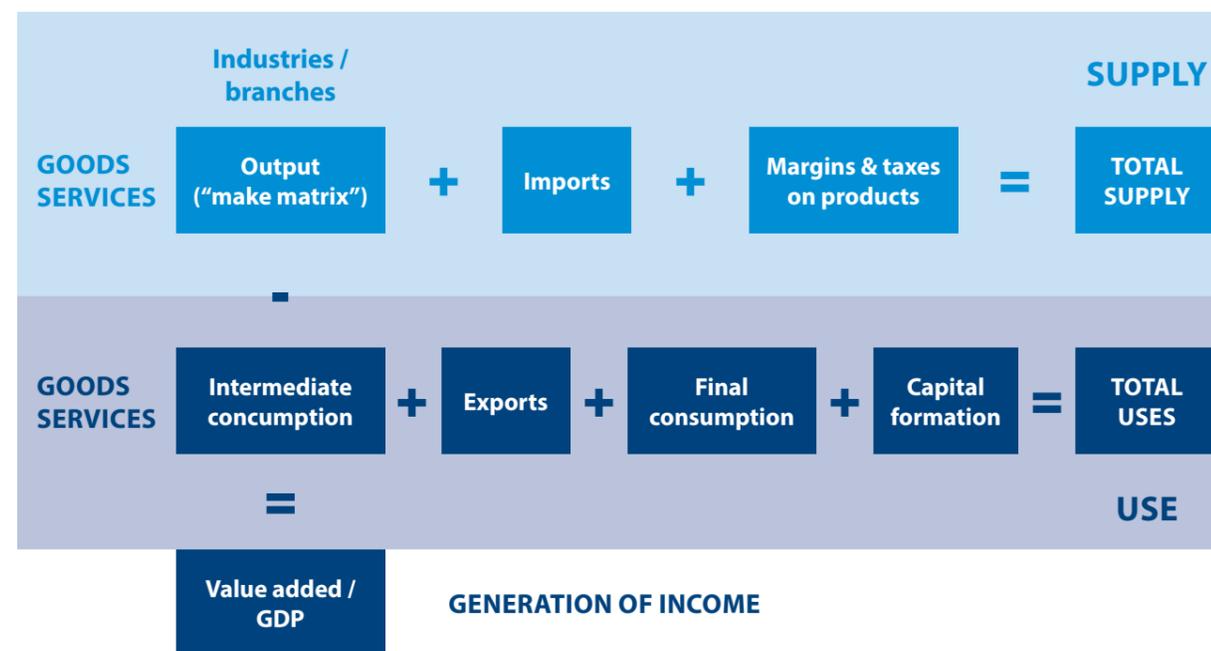
- For each product, supply compilation – output plus imports – goes hand in hand with estimates of absorption of the *supply* by the various possible *uses*: intermediate consumption of industries, final consumption, capital formation, and exports.
- By design, this distribution of the *supply-side* among the *use-side* is equal, in terms of purchasers’ prices, because the SUT adjusts supply by adding trade and transport margins and import duties.
- Components of the expenditure side are reconciled, in parallel with other data sources – mainly household consumption, government consumption, and exports.
- Imports of goods on the supply side of the SUT are recorded as reported in merchandise trade statistics, which means at cif values. Because in National Accounts as well as in the

BOP, imports as well as exports are recorded fob, it needs a global correction position called “cif-fob adjustment” (for more details see section 6.5).

- Imports of services are usually those reported in the country’s Balance of Payments (BOP), compiled by the central bank.

The scheme shows the general structure of a SUT, with supply in its upper part and uses in its lower part. The upper part includes the conversion of the supply at basic prices (output) and cif-values (imports) to the purchasers’ prices by adding for each product the trade and the transport margins and the taxes less subsidies on the products. The use components are intermediate consumption, final consumption expenditures, gross capital formation and exports. If the supply table is extended vertically to capture the components of gross value added, also, then it enables the calculation of total output per industry, being equivalent to the total inputs.

The components of supply and uses in the SUT



A strongly squeezed, simplified and fictive numerical example for a SUT is explained in more detail in annex 12.5.

One of the big advantages of a SUT is that – like in equation systems with unknown variables – estimates for data gaps are supported by forcing the figures into a tight jacket of the balancing requirements underlying the SUT. Usually, intensive use is made of commodity flow approaches¹⁸ which means to measure output and imports from the demand end rather than from the front end of the production process which is origin of the supply (output and imports). The problem is that the various source data must be made commensurate when merged (for example, for recording the supply and the uses of “fuel”): the Central Product Classification (CPC) for the domestic production, the Harmonized System (HS) of the external trade statistics, the Classification of Individual Consumption according to purpose (COICOP) for the household expenditures and the Chart of Accounts (GFS classification) for the revenues and expenditures of general government. This is one of the reasons why National Accounts are highly interested in economic statistics which are accurately classified and why some statistical agencies assign the responsibility and custodianship for the classifications domain to the National Accounts departments.

2.7. Sub-systems (quarterly, regional and satellite accounts)

Even if countries are still on milestone 1 of the extension of their National Accounts (see section 2.5), they may, nevertheless, compile sub-systems of the SNA which may suit political or social demand for macro-economic figures better than the annual GDP. Like every statistical figure has three dimensions (“what”, “when” and “where”), we can group them whether their objective is to refer to special topics, special periods, or special regions:

Special topics are usually covered by “satellite accounts”. A satellite account is linked to, but distinct from, the central system. Many satellite accounts are possible but, though each is consistent with the central system, they may not always be consistent with each other.” (SNA 2008, 29.4).

Broadly speaking, there are two types of satellite accounts:

- Some rearrangement of classifications, possibly with complementary elements and additional variables, going deeper into the details. Examples are satellite accounts for education, tourism and environmental protection expenditures. They may be seen as an extension of the key sector accounts.
- The second type of satellite analysis is mainly based on concepts that are alternatives to those of the SNA. The most important example is the System of Health Accounts (SHA) developed by WHO, Eurostat and the OECD¹⁹. The SHA follows as far as possible the concepts and definition of the SNA but defines and classifies the expenditures on health in a very special way, including, for example, the output of pharmacies and even of taxi drivers (if it is for transport of outpatients) as health expenditures. Nevertheless, it would be worthwhile for compilers of National Accounts to reconcile their figures on health services with those of the health accounts (if carried out for the country).

For special periods (other than the annual accounts), the quarterly accounts are the very common example. Meanwhile, many countries are compiling them. From the conceptual point of view (valuation concepts, definitions, classifications and accounting rules), there is no difference to the annual accounts. But the compilation may, nevertheless, differ because of other data sources and because of the need to use extrapolations and preliminary estimates rather than final calculations. The purpose of quarterly results is early information. Hence, it is very common to work with preliminary figures which must be revised later. Special attention is to be given to benchmark the total of the quarterly results with the figures of the annual accounts.

For special regions, there are two variants: one is the compilation of regions below the national level (in the SNA called Regional Accounts). The other is the compilation of results for groups of countries (supra-national accounting), as it is common, for example, for countries of a currency union or of a political union like the Regional Economic Communities (RECs) in Africa. In both cases, the general rules of the SNA are kept valid. But in Regional Accounts, the transactions of multi-regional units, e.g. of general government or companies with affiliates dispersed over the country need special attention. For the supra-national accounting, the major problem is to consolidate transactions between countries belonging to the same supra-region, e.g. imports or exports between them.

(18) In the SNA now called “product flow approaches” because these approaches may not only be dedicated to commodities but to services, also. In the SNA, “product” is the generic term for goods (commodities) and services.
 (19) WHO, OECD, Eurostat, A System of Health Accounts, 2011 EDITION, web-reference <https://www.who.int/health-accounts/methodology/sha2011.pdf?ua=1>

2.8. ERETES and similar software tools

Despite of all achievements of harmonizing National Accounts, the software solutions for its compilation are few. Many countries still rely on spreadsheet related software like EXCEL or general statistical package tools. Nevertheless, there are some tools which had been developed especially for the compilation of National Accounts. In Africa, the most common one is ERETES, mainly used in (but not necessarily confined to) the francophone countries in West-Africa. It is a mighty and highly complex software. The description of the methods is integral part of it. Here, only a short summary of this software is given, based on a presentation at the IARIW General Conference 2016.²⁰ IARIW stands for the International Association for the Research in Income and Wealth, the international forum for discussions among National Accountants world-wide and since decades.

AFRICAN COUNTRIES USING ERETES SOFTWARE

Morocco, Mauritania, Tunisia, Algeria, Niger, Chad, Senegal, Guinea, Guinea-Bissao, Capo Verde, Mali, Burkina Faso, Ivory Coast, Togo, Benin, Central African Republic, Democratic Republic of the Congo, Republic of the Congo, Gabon, Cameroon

ERETES is a software package that includes a software tool, a methodology to build National Accounts but also an assistance process. ERETES can be visited on its own website.²¹ It provides assistance in compiling accounts which comply with the international standards of SNA 2008. ERETES is available in 3 languages: French, English and Spanish. It associates:

- An assistance process with the organization of the work of the team of accountants,
- A database in which the user downloads the data provided by his statistical system,

- Worktables to analyse these data in order to make them compatible, in an iterative process crossing different points of view: goods and services, distributive transactions, financial transactions, institutional sectors.

The result of this work are the two main synthesis components of the SNA 2008: the Supply and Use Table and the Integrated Economic Accounts, including financial accounts but excluding balance sheet accounts. ERETES serves as a place for storing data and working tools, as a tool for organizing teamwork and as an itinerary to transform the «inputs» (incoming data) into outputs (results produced)

ERETES is co-owned by Eurostat, INSEE and the users' community who discuss its developments during the bi-annual steering committees. Currently, about 30 countries over the world are using ERETES including around 25 Northern and Sub-Saharan African countries.

Similar tools have been developed for some countries in the south of Africa, the most common being NADABAS. NADABAS has been developed by Søren Netterstrøm (IT Expert, Denmark) in cooperation with Jan Redeby (National Accounts Expert, Sweden) supported by a Scandinavian Project. It was first designed and established in 2004 in Mozambique, now it is also used in Lesotho, Kenya, Swaziland, partly South Africa, soon possibly also Botswana and Zambia. Its technical features are:

- The operator's desktop / entry point is an EXCEL file. It embeds a customized add-in function as a link to the underlying ACCESS data base. The add-ins must be installed before making NADABAS operational.
- Like ERETES, NADABAS has a standardized structure (templates) for showing the relevant variables per ISIC position (SNA-transaction code, amount, period, kind of output (market or non-market), deflator etc.) and per aggregate of the expenditures. But despite of the standardized structure, any user or country can adapt and customize the different classifications (products, industries...) flexibly according to own preferences.
- NADABAS includes separate files for each classification used in the system (ISIC, transaction codes, sectors etc.).

- Because of its standardized structure, it needs freely formatted EXCEL files and sheets to prepare results of a survey or of another source to be brought into the structure required for the upload to NADABAS. These files are captured in the data base, also, ditto any other kind of documents.

- Data entries are stored in interim files. They are uploaded to the data base through batch routines which can be initiated at any time.

- Each cell can be entered for writing or reading comments or for accessing the content information. Each cell filled by a formula can be overruled by manual data entry.

- NADABAS provides a lot of links for navigating between its various files.

- NADABAS stores the data and calculates according to the definitions and equations foreseen in the SNA, e.g. adding GVA and IC to get output. Common routines like using IO-ratios for calculating IC from output are not foreseen and must be done outside the data base.

- NADABAS is used for the QNA, also.

- Like ERETES, NADABAS requires specifying not only the industry but also the sector for the entries of output, IC and the GVA components. In a lot of cases, this is straightforward but for some activities and products, the allocation to sectors needs estimates through keys. This is especially true for distinction between private producers of the household sector and those of the non-financial corporation sector.

- In contrast to ERETES, NADABAS does not provide a tool for SUTs.

Both tools, ERETES as well as NADABAS, expect the compilers to strictly obey to the formats and contents required. Both tools presuppose knowledge of National Accounts. Both tools need external support for the maintenance of the software.

(20) Dominique Francoz and Jean-Samy Aziz (INSEE), *The Use Of ERETES for a Better Consistency of National Accounts Data over User Countries*, paper prepared for the 34th IARIW General Conference, 2016, Dresden, Germany, web reference: <http://www.iariw.org/dresden/francoz.pdf>

(21) <http://www.eretes.net>

3.

Main data sources

3.1. Data characteristics

National Accounts are based on various kinds of data. It is imperative for compilers to be aware of their characteristics and their origin. A very short summary of the basics is given in this section. It is invariant to the countries or continents as world-wide the statistical systems meanwhile are following international standards, most of them endorsed by the United Nations' Statistical Commission where all countries in the world are members of. An overview of the African Statistical System is given in the "Strategy for the Harmonization of Statistics in Africa (SHaSA)" from 2018, to be found under <https://au.int/en/ea/statistics/shasa>.

Every statistical figure has three dimensions. It must be defined by the subject ("what"), by the region ("where") and by the point or period of time ("when") it refers to. They may be dimensioned as quantities or as qualities, in the first case in physical or in monetary numbers and in the latter case (qualities) often making use of classifications.

Primary data are especially collected for statistics, while secondary data stem from data collection for other purposes, e.g. customs declarations, taxation, registration of cars etc. (therefore often also called administrative data). Meta data are data "about the data", e.g. classifications, definitions (including source of definition), descriptions of concepts and methods, of the modes of data collection or of design and raising of samples, but also information about the legal basis for the data collection.

Also relevant for designing the statistical system of a country with regards to the needs of National Accounts is a distinction which is rarely found in the textbooks. It is between light value and heavy value data. Light value data are homogeneous in (small) size with low variance, e.g. data of households or of small-scale business enterprises. Among them, there are no units with a paramount weight within the population. For primary statistics surveying these units, area sampling is a common method of data collection.

	Light value data	Heavy value data
Do several statistical units in the population of units have a paramount weight?	no	yes
Examples	households in household surveys	economic censuses or surveys
Problems to deliver data?	no, even micro data can be supplied	yes. We must aggregate units, variables or even aggregates, e.g. regions

In contrast, heavy value data comprise units which have outstanding weight, e.g. big industrial producers, often even regionally conglomerated in business hubs. The respective statistical units are inhomogeneous in size and unevenly dispersed between regions; area sampling would be inappropriate. It needs either a census approach or sampling methods using a list frame, often with a stratum of total selection above a certain threshold. Such surveys or censuses are costly, and National Accounts must cope with the fact that there are gaps in the periods of observation.

3.2. Primary economic statistics

Economic statistics describe economic actors and their transactions in the economy. These processes can, in principle, be observed in two ways, i.e. from the perspective of the actors in the economic process (actor approach) and from the perspective of the phenomena to describe (functional approach). Examples for the functional approach are the merchandise trade statistics where the exports and imports of goods are not reported by the exporters or importers but by customs authorities monitoring and supervising the traffic of the goods. Other examples are the statistics based on tax declarations of taxpaying companies. In most cases, data from the functional approach are secondary ones, i.e. they are collected by other authorities than the statistical offices.

Primary economic statistics are usually based on interrogations of the actors themselves. This approach is based on statistical units. In doing this, the statistical offices follow the concepts of the System of National Accounts (SNA) which intensively deals with the actor approach and types of units. Statistical units, as well as classifications, can be considered the cornerstones of the statistical framework,

as well as instruments for co-ordination of the variety of economic statistics. For compilers of National Accounts, it is imperative to have a clear understanding of the statistical units:

- Statistical units can be households, government units, non-profit institutions serving households or corporations (financial or non-financial).
- Economic actors can be enterprises or establishments. In its "research agenda", the SNA also shortly mentions enterprise groups (SNA A.413), which for the practical work in most African countries are irrelevant.
- All statistical units are economically active, but not all of them are producers: all households consume but only some of them own an (unincorporated) enterprise.

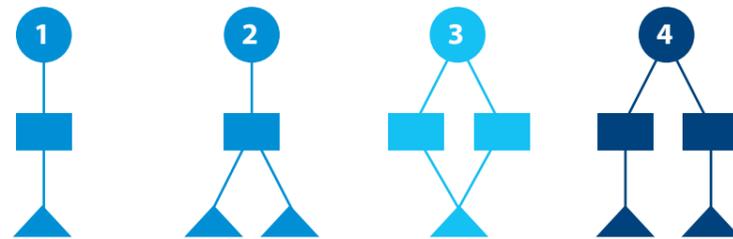
The scheme shows the hierarchy: enterprises may have several establishments, either at the same or at different locations. Establishments are classified by the kind of activities, possibly by different ones (primary plus secondary or tertiary activities). Moreover, in its four cases for the enterprises, the scheme shows the four possible variants: (i) the most common case: enterprise and establishment are the same, with only one kind of activity; (ii) an enterprise with only one kind of activity, but two establishments at different locations; (iii) an enterprise with only one establishments but two different kinds of activity; (iv) an enterprise with more than one activity in separate establishments.

Types of units: schematic example

Enterprise

Kind-of-activities

Establishments / local units



In case 3, the local unit may either be split into two establishments (if data permit) or there will be primary and secondary activity.

For measuring GDP from the production side and for Supply and Use Tables (SUT), the establishment level is the preferred one in the SNA as the allocation of kind of economic activities by ISIC classifications are to be made at that level, while the enterprise level data are the preferred ones for compiling the institutional sector accounts. Hence, for primary economic statistics, the preferred response unit should be the establishment, possibly with an additional survey component for the multi-establishment enterprises. Examples for such censuses or surveys or combined forms are not internationally standardized. Common names are "Business and establishment surveys", "industrial census", "construction survey" or the like. It goes without saying that the compilers of National Accounts as important users of the expected results should be involved in the design of such surveys and in the definition of the respective variables.

A special variant of primary economic statistics are the statistics on consumer prices and producer prices. For them, the National Accounts are not only important users. They are also determining the concepts and the methods of price statistics. While this is well understood for the producers' prices, it is often not known that this is also true for the consumer prices. The SNA spends a full chapter on it (SNA, chapter 15, Price and Volume measures). The reason is that economic growth is one of the main variables the National Accounts are aiming at. For that purpose, it needs to know the price changes which solely are due to inflation. The increase of economic value of, for example, output is given as the product of increases of prices and of volumes where volume is not only quantity but also quality. Hence, measuring growth (increase of volume) means to divide the increase of value by the increase of prices, provided that the increase of prices does not include any components which are due to quality changes. Many price collectors in the statistical offices may not be aware that all efforts to

eliminate quality changes from the price observation are a conceptual request from the National Accounts.

Other relevant primary economic data sources are individual data collected from State Owned Enterprises (SOE) and NGOs.

A special case is harvest estimates: the data are collected for the purpose of statistics (estimates); hence they would fall under primary statistics. But often the data collection is done by government units or semi-government administrations, thus falling under secondary statistics.

The primary statistics used by the National Accounts include those which not primarily be perceived as economic statistics, e.g. multi-purpose sample surveys with households providing useful data on incomes and consumption of households or of the labor provided by them. Moreover, National Accounts also use censuses of population or of housing.

3.3. Secondary statistics

While primary data are those collected for the purpose of official statistics and by statistical offices (and other producers of official statistics), secondary data are collected for other purposes than statistics. Mainly, but not exclusively, secondary data stem from government agencies other than statistical offices. Statistical offices call them administrative data.

There are six scenarios for the genesis of official statistics from secondary data:

1. The government agency collecting the data is not capable to produce statistics out of them. Thus the statistical office as the country's competent agency comes in to do it.

2. The government agency collecting the data would be capable to produce statistics out of them. But for the sake of specialization (possibly politically intended), the job is given to the statistical office.

3. As a matter of principle (political hygiene) and for the sake of impartiality, the production of all official statistics (including those from administrative sources) is given to the NSI, possibly even by explicit political will.

4. The government agencies collecting the data are many and it needs to bundle them. In this case, the NSI also functions in collecting the data.

5. Administrative data are just one of several other components of multi-source based official statistics as, for example, production indices or NA.

6. Administrative data are not object of official statistics themselves. They instead are used for the preparation of list frames for censuses or surveys for primary statistics. Special case would be the utilization for a statistical business register.

Mergers of scenario's 1 to 6 are also possible, of course.

Using administrative data has some advantages. The most striking one is, of course, that it saves costs and sometimes even time when data for statistical purposes are used which are already collected. Moreover, administrative data can be more comprehensive and more accurate than data from primary statistics as the providing authorities may have tough auditing mechanisms for them, e.g. tax data, while for primary statistics the NSIs depend on the good will of their respondents.

Some domains are by their very nature not accessible for inquiries through statistical offices themselves. It needs police stations, clinics, courts of justice etc. as reporting intermediaries. And often special knowledge at these intermediaries is needed (death statistics, diagnose statistics,...).

Common examples for administrative data are:

- Vital statistics delineated from population registers
- Education statistics made of data from the respective ministry.
- Health statistics made from data from hospitals and clinics.
- Tax statistics made from anonymized tax declarations on income, sales or wealth.
- Crime statistics made from records of police stations.
- Employment statistics made from records of social security systems, government records or employment agencies.
- Building licence statistics out of construction permits.
- ...

But there are also some problems with administrative data:

- As the primary purpose of collecting them is not statistics,

administrative data do not necessarily follow the same definitions, classifications, regional and time references as their utilization for statistical purposes would require.

• If not clarified by law the statistical offices depend on the good will of the collecting agencies to provide the data in time, in format, in scope and in accuracy as desired.

• The statistical agencies are sitting at the end of the pipe of data delivery. If it turns out that data seems to be implausible then for clarification, they have to go back to the data providing agency. Direct contact to the original provider of the data (person or company or institution) is usually not possible.

• The government agencies often are very lenient in collecting those data which in their eyes are "just for statistics".

• In difficult cases of applying statistical classifications they tend to decide on positions which the classification offers for "other...".

• The government agency may have a problem when the results of statistics differ from figures they already produced internally out of the same data. Therefore, reconciliation with them is necessary. The question of the "ownership" of the data may come up.

3.4. Business registers

Many countries run statistical business registers for creating comprehensive list of respondents falling into the scope of intended surveys and hence for improving their quality, at the same time easing the logistics of data collection. They keep the business register as a directory of possible respondents and in the form of a regularly updated file system. For the National Accounts, it is important that the definition of statistical units and of the stored variables, the industrial classification and the regional allocation is in line with the requirement of the National Accounts. If this is the case, the business register will not only provide the list frame for comprehensive censuses or for cost-saving sample surveys. It will also significantly contribute to the quality of the results of the National Accounts.

While the main purpose is to identify the respondents for primary statistics, the data source for establishing a business register are mainly secondary sources, e.g. business license permits, tax declarations or tax registers, directories run by chambers of commerce, business associations or providers of electricity, or simply public media and the internet. But, once established, the incoming individual results of censuses and surveys will also be used to update the register.

4. Transactions of general government

4.1. Overview

General government is one of the five institutional sectors of a domestic economy in the system of National Accounts as designed in the SNA. But in contrast to the other four —financial corporations, non-financial corporations, households, and non-profit Institutions serving households — it has an overarching character in the economy and is intensively involved in all components of the system. General government is:

- (i) The main producer of non-market output.
- (ii) A special and relevant consumer of goods and services.
- (iii) An important investor; and
- (iv) Most importantly, it is the sector mandated to levy taxes and duties, and to provide subsidies, grants, and social benefits, in addition to interacting with international institutions.

According to the SNA (par. 4.30), general government “mainly consists of central, state and local government units together with social security funds imposed and controlled by those units. In addition, it includes non-profit institutions (NPIs) engaged in non-market production that are controlled by government units or social security funds.” In most countries, it consists of the central government, the provincial or state governments, the municipalities. But only few countries in Africa have a subsector social security funds. Such a sub-sector exists when social security schemes are separately organized from the other activities of the government units. For the definition of social security schemes see the section 4.2.3 on social contributions below.

The character of general government as being mainly a non-market producer is outlined in the conceptual details in SNA 4.20 and 6.133. It follows that, in contrast to market producers, the output must be determined additively by its components:

$$\begin{aligned}
 & \text{net operating surplus} \\
 & \text{plus} \\
 & \text{consumption of fixed capital} \\
 & \text{plus} \\
 & \text{compensation of employees} \\
 & \text{plus} \\
 & \text{taxes (less subsidies) on production} \\
 & = \\
 & \text{GVA (gross value added)} \\
 & \text{plus} \\
 & \text{IC (intermediate consumption)} \\
 & = \\
 & \text{output}
 \end{aligned}$$

In the SNA, the net operating surplus of non-market producers is assumed to be nil as far as their non-market production is concerned. Government’s taxes on products paid and subsidies received are rare but not necessarily nil.²²

4.2. Gross value added

4.2.1. Compensation of employees: overview

The most relevant components of GVA are compensation of employees and consumption of fixed capital. When the coding of the Government Finance Statistics (GFS) is used, the wages and salaries are captured under object code 21. A special case is wages and salaries in kind, in the coding of GFS as a sub-position under object code 212. In many developing countries, not only in Africa, it is common to provide salary components in kind, be it for transportation or for housing services, for childcare or simply for the provision of food or clothes. It is imperative for them to record the salaries in kind according to the SNA rationale. Therefore, it is further outlined below.

Two other special sections below tackle social contributions and consumption of fixed capital. Both are also worth to be looked at from the African perspective.

4.2.2. Wages and salaries in kind

Wages or salaries in kind are incomes of the employees. They use these parts of income to purchase exactly those goods or services which their employer has provided to them instead of cash.²³ As a result, their saving is not influenced by the wages in kind.

Hence, it is necessary to impute a sale from employer to employee. Even in case of general government, the sale must stem from market output (see SNA 6.99c), simply because households cannot purchase non-market output (unless small administrative services like issuing driver licenses passports or visa etc.). Consequently, any expenses related to salaries in kind, e.g. fuel for transports, food for meals or renovations for housing services, are to be treated as intermediate consumption for the respective market output.

But there is a difference between remuneration in kind given by private employers and those given by non-market producers. In case of private employers, remuneration in kind, if granted, would be balanced by a decrease in the employer’s operating surplus, with GVA remaining the same as a result of a zero-sum game of distribution. In the case of government employers, however, or of non-market producers in general, the net operating surplus remains zero by definition. Like in the case of increases of the cash salaries of government employees, the increase of their remuneration in kind would result in an increase of GVA and hence of GDP. What at first glance looks like double-counting, may be illustrated in three cases where employees are offered free transport by their employers to their place of work and back in amount of 100 currency units:

- a. A private employer purchases these services from a bus company.
- b. A government employer purchases these services from a bus company.
- c. A government employer produces the transport services by itself with own buses and staff (fuels and other intermediate consumption 40 and compensation for bus drivers 60).

The recording according to SNA is shown in the table for all three cases. For simplicity, it is assumed that the intermediate consumption of the bus company is zero.

(22) (Sophisticated) examples could be VAT to be paid by a canteen of a statistical office or subsidies received by it for printing its publications on environmentally friendly paper.
 (23) SNA 9.51: “... Workers receiving remuneration in kind are treated as making expenditures equal to the market value of the goods or services received ... , the costs of the expenditures being met out of the income they receive as remuneration in kind. Thus, the values of the goods and services must be recorded as final consumption expenditure incurred by households as well as income in kind.”

Row	Transaction	Case a	Case b	Case c
1	Output / GVA of the bus company or other providers	100	100	40
2	(imputed) market output of the employer	100	100	100
3	Intermediate consumption of the employer (market prod.)	100	100	40
4	Compensation of employees for market production	100	-	60
5	Compensation of employees for non-market production	-	100	100
6	Operating surplus of the employer	-100	-	-
7	GVA of the employer	-	100	100
8	(Imputed) final consumption expenditures households	100	100	100
9	Non-market output (because of increase of GVA)	-	100	100
10	Final consumption expenditures government	-	100	100
11	GDP production side (rows 1 + 2 + 9 - 3)	100	200	200
12	GDP income side (rows 1 + 4 + 5 + 6)	100	200	200
13	GDP expenditure side (rows 8 + 10)	100	200	200

In practice of the budget performance, however, often only the expenses related to salaries in kind, e.g. the food for the meals, the fuel for the transports or the medicine for the medical treatment, are directly recorded, leaving aside the imputed transactions. In the better case, this is done under object code 212 (wages and salaries in kind), where at least the effect on GDP is correctly covered, albeit resulting on the expenditure side in government final consumption and not in private consumption (as it should be). In the worst case, it would be recorded as intermediate consumption, enhancing general government's output but not its value added.

If of relevant amount, it would be necessary to record remuneration of government employees in kind fully according to SNA, using the appropriate value of the government's market output (valuation see SNA 7.49) for compensation of employees as well as for household final consumption. Otherwise, GDP would fall short of its proper level and structure.

4.2.3. Social contributions

Compensation of employees includes social contributions, regardless whether paid by the employer or by the employees. Materializing this SNA rule requires to enter the subject of social security as defined in the SNA.

Among the countries of the world, social security has very diverse facets. Consequently, the SNA's terminology of tackling them is a bit abstract, and each country must translate it into its specific national institutional arrangements. First, it is important to differ between insurance schemes, social insurance schemes and their two main types, social security schemes and other employment related social insurance schemes, and to see the hierarchy in them:

- Insurance schemes are not necessarily social insurance schemes. They can cover any kind of risk, be it fire, accident, theft or sickness or unemployment or whatever. They can even be life insurance schemes which in the SNA are to be treated as saving schemes of households, nourished by financial rather than distributive transactions (unless purely covering the risk of death).
- Social insurance schemes are founded on an employment relationship, even if the participants are self-employed or currently unemployed. The beneficiaries get social benefits as defined in the SNA (pensions and non-pensions²⁴) on grounds of their participation in the scheme. Moreover, a

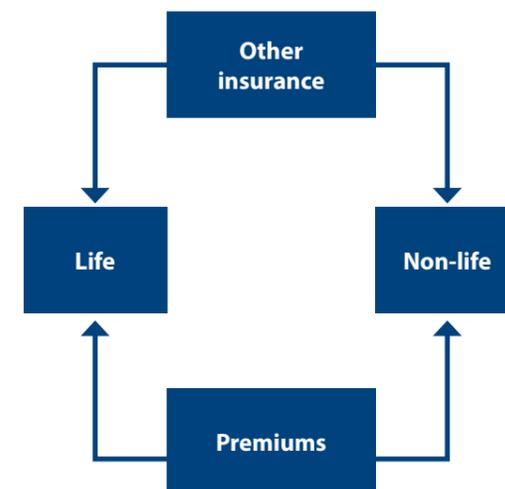
social insurance scheme must meet at least one of the three conditions: (i) participation in the scheme is obligatory either by law or by employment conditions, (ii) the scheme is a collective one, operated for workers, (iii) an employer makes a contribution (actual or imputed) on behalf of the employee. Social insurance schemes may be organized privately or by the government.²⁵

- Social security schemes cover the community as a whole or its large sections and are "schemes imposed, controlled and financed by government units for the purpose of providing social benefits to members of the community as a whole, or of particular sections of the community" (SNA 8.77).
- Other employment related social insurance schemes "derive from an employer-employee relationship in the provision of pension and possibly other entitlements that

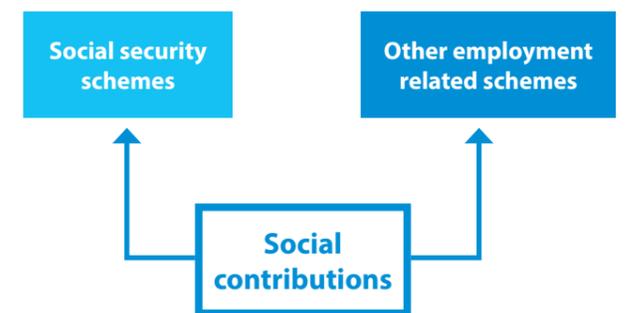
are part of the conditions of employment and where responsibility for the provision of benefits does not devolve to general government under social security provisions" (SNA 8.76 b).

The definition of the "other employment related social insurance schemes" is abstract. But this kind of schemes is presumably the most common in Africa, where many countries do not have a social security scheme in the sense of the SNA (requiring coverage for the whole country) but provide old age pensions only for their former employees and their survivors. The SNA (8.76) recommends that "social insurance schemes organized by government units for their own employees, as opposed to the working population at large, should, if possible, be included in the group of other employment-related schemes and not remain within social security schemes."

Insurance schemes



In most African countries, the old age pensions of the government employees are funded on a pay-as-you-go basis which means that the contributions receivable from today's active employees are used to fund the pensions payable to today's retirees. There is no saving element involved, neither for the employer (government) nor for the employees covered by the scheme. In the SNA accounts as well as in the fiscal budgets, no liabilities are recognized.



In the fiscal budget, the old age pensions are shown under code 273 as "employment-related social benefits" (if the GFS international nomenclature is used). In case that the government deducts actual social contributions from the salaries of the active employees, these would be recorded as GFS code 171 "Retirement contributions" under government revenues.

(24) The SNA specifies the non-pensions in SNA 8.68 ff., not explicitly naming the underlying risks. For simplicity, the main ones can be summarized as sickness, unemployment, disability to work, widowhood.

(25) For more technical details see SNA 8.65.

If the social security scheme is organized as a pay-as-you-go system (which means that it has no own capital stock separately held for this purpose), social contributions can fully be treated as integral part of compensation of employees.²⁶ The amount would be the total of cash contributions and of imputed contributions. The imputed contributions are not to be found in the fiscal budget. They must be estimated. If over the years the relation between active and retired staff is stable, then a simplified solution would be to assume a 1:1 relation: the actual pension expenditures are fully to be covered by the imputed social contributions. Compensation of employees can then simply be depicted from the GFS by adding code 21 (wages and salaries) and 273 (sub-position pensions, as the yardstick for the imputed social contributions).

If the social security scheme is organized as a pay-as-you-use system (it means funded by a capital stock), it gets more complicated and its description goes beyond the purpose of this manual. But finally, the compilation must also result in figures for actual and for imputed (if any) social contributions, either by the employer or by the employee or by both, making up compensation of employees.

Social security schemes are not confined to old-age security. They may as well cover sickness, unemployment or other risks. Moreover, social insurance schemes must not be confused with “social assistance” where the government gives social benefits to needy persons outside a social security scheme.

To sum up: for the calculation of GDP, it is relevant to include all social contributions of government employees into their compensation and hence into the GVA of the government, regardless of whether the country entertains a full-fledged social security system or just an employment-related scheme confined to its own employees.

4.2.4. Consumption of fixed capital

In sophisticated National Accounts, consumption of fixed capital (cfc) is delineated from capital stock calculations. For most developing countries, such capital stock calculations are extremely difficult and resource-binding, often even out of reach. Capital stock calculations, if done according to the recommendations of the SNA, require long time-series of detailed data on capital formation. Countries with lack

of such data and lack of resources may consider refraining from it. The quality of their GDP calculation will not suffer so much because all relevant economic aggregates are recorded “gross”, anyway, be it GVA, GDP, gross disposable income or gross saving.

For milestone 1 (GDP calculation), there is only one (minor) issue where consumption of fixed capital is needed. This is the calculation of the output and hence the value added of the non-market producers like general government and the NPISH. Developing estimates of cfc rather than delineating it from complicated capital stock calculations would be a reasonable alternative. As cfc is a pure internal transaction and is not be observed as such, consequently not recorded by GFS, it needs estimates.

Estimation based on compensation of employees	Estimation based on compensation of employees
Common assumption: government compensation of employees is 100, Gross fixed capital formation (GFCF) is 80. Taxes on production are zero. Net operating surplus is zero by definition.	
Assumption: cfc is 6 % of compensation of employees	Assumption: cfc is 5 % of GFCF
GVA is 106	GVA is 104

Such estimates could be based on a certain ratio of the capital formation or of the compensation of employees of the same year, possibly improved by using gliding average of the last years, say 3, 4 or 5. From the economical point of view, using capital formation as a proxy may be preferred because correlation between capital formation and cfc is obvious and does not need further justification. But using compensation of employees as a proxy would also be easy to apply, possibly resulting in smoother changes over time as compared to using expenditures on GFCF which by their very nature are more volatile than the payments for labour. The basic assumption would be that the correlation of cfc with employment and hence with its payments is also strong. As a small advantage, with its link to employment, the distribution of the consumption of fixed capital by economic activity (ISIC) is already done automatically.

4.3. Allocation of government activities to industries (ISIC)

According to the SNA, figures for output and value added of the institutional sector general government are to be classified by economic activity (ISIC), irrespective of whether the government is engaged in public administration (ISIC section O), health services (ISIC section Q), education (ISIC section P), or any other kind of activity. The ISIC classification does not necessarily comply with the structure of the government by ministries and other agencies. Therefore, some countries make use of the function codes based on the internationally agreed Classification of the Functions Of the Government (COFOG²⁷), allocated to all budget data on actual expenditures. For National Accounts compilation, it would make sense to prepare bridge tables combining the function codes of the GFS with the codes of the industrial classification (ISIC).

It should further be noted that education, health services and other classes of the ISIC are frequented by other producers in the economy, also, e.g. corporations and households. However, by convention of the SNA, “Public Administration and Defence” (section O, division 84 of the ISIC) can only be assigned to institutional units of the sector general government.

Users may also be interested in figures of general government’s contribution to GDP from the production side, as it was common under compilations prior to the SNA 1993. Therefore, some countries compile this as an alternative by adding up the respective government figures from all ISIC positions.

4.4. Intermediate consumption and output

For most of the output of government units or of non-profit institutions, a valuation through markets does not exist as they usually do not sell what they are producing. They usually offer their output to the public at large without charging for it at all or at least without charging prices fully covering their cost. Nevertheless, like any other activity carried out against pay, the activities of government units and of non-profit institutions also contribute to GDP because employees of these units are reimbursed for their work done. Therefore, as non-market output lacks from market prices, it must be calculated as the sum of cost by convention, hence straightforwardly as gross value added plus intermediate consumption.

The figure for recording intermediate consumption can easily be captured as the total expenditures (recurrent plus development budget) of object code 22, presupposed that the international classification of GFS is used. But the figure for the object code 22 should be enhanced by three imputed transactions which in the GFS are missing:

- the imputed bank service charge (FISIM) recorded for the government in its capacity as depositor or as borrower (for the calculation of FISIM see section 12.3.3 in the annex of this manual).²⁸
- the imputed purchases of technical assistance or humanitarian aid (see section 4.6).
- the purchase of the non-market output of the Central Bank (in case that it is a non-market producer, see annex 13.3.5).²⁹

But the non-market output is not the only output component of the government. In most countries, the general government has some market output. It consists of two components. The first one is the equivalent for the wages and salaries in kind which according to the rules of the SNA must be recorded as market output, e.g. provision of food or housing services or transport services for employees (see also section 4.2.2). According to the GFS Manual 2014 (par. 5.140), these imputed sales (revenue code 1424 in the GFS nomenclature) “are recorded when a unit

(27) For the classification in detail, see annex 12.7.

(28) In the COFOG classification, it may all be allocated to COFOG 01 (general public services) which would fall under government collective consumption.

(29) The SNA is not outspoken whether the non-market output of the central bank is channeled through the production account of the government. In par. 6.155 it uses the term “purchase” of the non-market output. In the description of the components of intermediate consumption and of government’s final consumption expenditures, the output of the central bank is not mentioned. It is assumed here that the “purchase” becomes part of government’s IC. Anyway: in either case it will become part of government final consumption.

produces goods and services for the purpose of using them as compensation of employees in kind. The unit is acting in two capacities: as an employer and as a general producer of goods and services. In order to indicate the total amount paid as compensation of employees, it is necessary to treat the amount paid in kind as if it had been paid in cash as wages and salaries and then the employees had used this income to purchase the goods and services. This category includes the total value of these imputed sales.³⁰ In the National Accounts, under the use-categories, the imputed purchases related to the wages in kind would be recorded as final consumption expenditures of households.

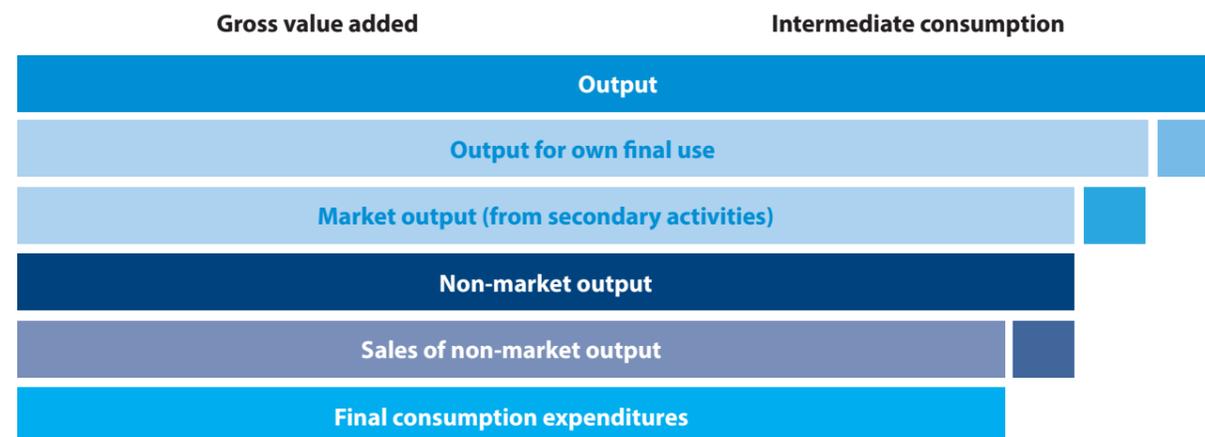
The second component of market output are various revenues from secondary economic activities of general government such as renting houses or shops out of its own property. Such sales of goods and services are recorded as revenue (under GFS code 1421) without deduction of the expenses incurred in generating that revenue.

Such market output must be kept apart from sales of fixed assets which in the GFS classification are not recorded as revenues. In the National Accounts, they are allocated to SNA-transaction P5113 "Disposals of existing fixed assets" which is captured under capital formation (with a minus) and not under market output. Ditto, the revenues from property must be included in the output only when they stem from renting of houses or dwellings. Rents on land are to be treated as property income, hence contributing to GNI but not to GDP.

Besides of market and non-market output, the SNA foresees a third category of output. This is the output for own final use. In case of general government, this can only be capital formation on own account (because output for own final consumption is already categorized separately as government final consumption expenditures). Examples are that government agencies provide planning services for the construction of motorways or may carry out construction work themselves. In-house produced software or R&D may also be covered under this item. The valuation is to be made by the sum of cost, including the cost for labour. Consequently, for avoiding double-counting, the SNA requires to subtract all amounts of wages and salaries connected with own-account capital formation from the compensation of employees recorded under non-market output.

In a final step, the figures of output and value added by COFOG are transformed to figures according to economic activity as per ISIC codes.

The scheme summarizes the compilation process from measuring output to deducting the non-market part of it. It is a schematic one. The size of the boxes does not correspond to the actual structure of the figures. In the last two rows, it also shows the transition from non-market output to final consumption expenditures.



4.5. Final consumption expenditures

Roughly speaking, the final consumption expenditure of general government is almost equivalent to the value of its non-market output or, in other words, government's collective consumption expenditure is the part of its non-market production which finally must be funded by itself. It is the public at large which consumes the goods and services its government produces for free.

The slight difference between non-market output and final consumption expenditures is made by goods and services which result from non-market production but, nevertheless, yield some revenues. Examples are fees for various administrative activities, sales of statistical yearbooks or official maps and gazettes and the like. It follows that for the compilation of general government's final consumption expenditures we must deduct what general government gets as a reward for its provision of non-market goods and services. The sales of non-market output must not be confused with the market output which the government creates from secondary activities as described above.

But it should be kept in mind that the actual expenditures as per GFS must be adjusted by estimates and imputations (consumption of fixed capital, consumption of imputed bank service charges, imputed purchase of the output of the central bank and of TA provided off-budget).

The non-market output is mainly but not fully attributed to the final consumption expenditures. The sales of non-market output are allocated to those intermediate or final users which have paid for these services.

It should be noted that, according to the BOP, there are also imports and exports of government services. These are, for example, services of the aviation authorities provided to international airlines. Overflight rights as such, however, are recorded as primary incomes, instead, similarly, to rents on land. Such incomes do not constitute GDP.

The SNA 2008 foresees that the final consumption expenditures (P3) of the government (and of the NPISH) are to be sub-classified further into individual consumption expenditure (P31) and collective consumption expenditures (P32). By definition of the SNA, collective consumption combines COFOG positions 01 to 06, 7.5 and 7.6, 8.3 to 8.6, 9.7 and 9.8 and 10.8 to 10.9 (for the meaning, see SNA par. 9.99 or, in deeper detail, the COFOG classification in

the annex). The rest of the COFOG positions constitutes individual consumption.

In many developing countries, general government's final consumption expenditure is mainly collective in nature.³⁰ The analytical fruits of showing the outlays of general government in a deeper functional detail appear when the figures by function are compared with those of other countries, in case of individual consumption possibly combined with the results of individual consumption of households and of NPISH.

In its outline of compilation of the institutional sector accounts, the SNA foresees special transactions called "social transfers in kind" which enables showing all individual consumption under the roof of the sector account for private households.³¹

4.6. Technical assistance recorded in government figures

Many African countries have been receiving important foreign assistance, for the most part managed by international organizations and related companies operating in these countries. For the purposes of National Accounts, accounting for such technical assistance needs some clarifications:

- The SNA uses different terms: technical assistance (SNA 8.128), development assistance (SNA 16.56), development aid (SNA 29.74), international assistance (SNA 22.101), and possibly others. But whatever the term, Technical Assistance (TA) is to be distinguished from other inflows of funds constituting financial transactions, for instance, foreign direct investment, portfolio investments, or loans. Donor assistance is recorded in National Accounts as provision of goods and services in combination with current or capital transfers.
- Development assistance and humanitarian aid are both based on contracts with the recipient country's government. Even if given directly in the form of goods or services, and despite being grants, they are recorded as if paid for by the recipient government, required by an imputed current or capital transfer from the donor country to the recipient country (SNA 3.82: transfers in kind).

(30) Some industrialized countries have an extended social security system with a lot of health services. In Germany, for example, government's individual consumption expenditure is almost twice its collective expenditures.

(31) See SNA 2008, paragraph 9.84 ff

- Donor assistance may be given on-budget (as financial means) or off-budget (in the form of goods and services). On-budget support may be discretionary budget support, or it may be non-discretionary, which means that it is “earmarked” for clearly defined purposes, often in the form of development projects.

- The recipient country may use on-budget support to purchase goods and services (increasing its intermediate consumption or its capital stock³²) or for transfers to individuals or other non-market producers (NPISH) to act on the government’s behalf.

- By its nature, off-budget support is “earmarked” but implemented through donors or implementation agencies (often consultancies) mandated by donors.

- For the National Accounts as well as for the BOP, it is crucial to determine:

- Which implementation agencies (consultancies or NGOs) are resident in the country and which are not.

- Which goods and services used for development assistance or humanitarian aid are produced by the recipient’s domestic economy and which are imported.

- Which staff employed for providing aid or assistance are residents in the country including “expatriates” if they are long-term residents.

One revision in the latest version of the SNA is relevant in this regard. According to the SNA 2008 (par. 4.13), branches of non-resident units are now treated, under certain conditions, as part of the economy in which they are located, and their activities constitute GDP of the host country. This may be the case for many permanent affiliates of foreign donor organizations (unless they belong to UN or other international bodies) or foreign companies.

Row	Transaction	Donor / ROW	Beneficiary country
1	Imports	100	100
2	Exports	100	100
3	Current international cooperation	100	100
4	Intermediate consumption government	100	-
5	Output government	-	100
6	Final consumption government ³⁵	-100	-
7	Effect on GDP (rows 2 minus 1 plus 6)	-	100
8	Effect on gross saving (rows 3 minus 4)	100	100

Recording foreign assistance can affect the structure of the aggregates on the expenditure side of GDP, especially imports and government’s final consumption expenditures, or even on GDP level. Hence, proper measurement and recording of foreign assistance in National Accounts requires close cooperation with the BOP compilers as almost all transactions related to foreign assistance affect the BOP. But the problem is to collect the respective data from different angles: customs and imports as well as the materialization of the TA (financial assistance is not the problem as there are no physical cross-border transactions and as the data are captured by the budget performance). Many donors are reluctant to share their actual expenditures with the authorities of the recipient country, sometimes simply refusing. The Compilation Guide to the BOP Manual openly addresses the problem: “Data on international development assistance in recipient countries is often poorly measured; also, in some countries a large portion of development assistance may be channelled through non-government organizations. As a result, the value of foreign assistance is understated.”³³ Two examples (a and b) may illustrate the problem:

a) After a natural catastrophe, country A gets humanitarian aid (say: foods) from the FAO, directly supplied to starving population through helicopters. The goods are channelled through the customs and recorded there (which may often be omitted but would be according to international rules). If the necessary imputation of a current transfer, combined with an imputed purchase of these goods by the government³⁴ are not recorded, GDP would falsely shrink in amount of the imports. GDP should, instead, remain the same because the aid is a donation. The proper recording is given in the table below, assuming that the value of the food aid is 100 currency units:

By the way: damages resulting from catastrophes as, for example, those produced by Cyclone Idai in March 2019 in Mozambique and Zimbabwe must not be recorded as consumption of fixed capital for two reasons: (i) As GDP is a gross aggregate, the catastrophe damages would even blow it up rather than showing a negative impact. (ii) Consumption of fixed capital represents the normal wear and tear because of economic activity. But it is the catastrophe and not production activity which destroys the fixed assets. In a full-fledged application of the SNA, the catastrophic losses would be recorded as such (“other flow” with code K3) in the “other changes in assets account”.

b) Country A gets Technical Assistance (TA) from country B. Both countries agree that country B provides a modern clinic plus the necessary equipment and the training of the staff. The donor correctly reports the amounts of expenses (including the imported goods) to the respective ministry, but the imports of equipment have not been recorded properly because it was agreed to transfer the goods duty free. In this case, it is the other way around: proper recording of imputed current and capital transfer and imputed purchase of the government of these goods and services are not required by the respective imports. GDP would wrongly increase because of increased government consumption and increased government GFCF, not being required by an import in same amount. The table below shows the proper recording, assuming that the capital goods (clinic assets) are 100 and the training of the staff is 50:

Row	Transaction	Donor / ROW	Beneficiary country
1	Imports of goods	-	100
2	Imports of services	-	50
3	Exports of goods	100	-
4	Export of services	50	
5	Current international cooperation	-50	50
6	Capital transfers	-100	100
7	Gross capital formation ³⁶	-100	100
8	Intermediate consumption government	-	50
9	Output government	-	50
10	Final consumption government ³⁷	-50	50
11	Effect on GDP (rows 3 + 4 - 1 - 2 + 7 + 10)	0	0
12	Effect on gross saving (rows 5 minus 10)	0	0
13	Effect on net lending (rows 6 minus 7)	0	0

The examples show that international cooperation, if recorded properly, must neither influence GDP nor the two important balancing items saving and net lending / net borrowing.

The examples also show that reconciliation with the compilers of the BOP and the authorities recording the TA is a must. Recording the imputed transactions of the government should only be made when it is for sure that the respective imports are also captured properly. And vice versa: if there are significant imports of goods for the purpose of TA, it is necessary to impute purchases of the government in at least the same amount, required by an imputed current or capital transfer from abroad.

(32) SNA 8.128: “... Current international cooperation does not cover transfers intended for purposes of capital formation; such transfers being recorded as capital transfers.”

(33) BOP 6 Compilation Guide, par. 6.30.

(34) Against spontaneous assessments, the humanitarian goods are not household consumption because they do not pay for it. They can only be government (individual) consumption.

(35) SNA 22.103: “When the goods and services and associated delivery charges are donated by government, NPISHs or households, the items are negative final consumption matching a transfer in kind. If the items are provided by corporations, they are recorded as a transfer in cash followed by a purchase of the goods by the recipient. In both cases the items involved are included in exports of the donor country and imports of the recipient country.”

(36) In this case of TA, the imputed capital transfer goes hand in hand with capital formation, be it fixed capital formation or changes in inventories. SNA 10.204: “A capital transfer in kind necessarily concerns the change of ownership of a product previously recorded as a non-financial asset in the accounts of the donor. In this case, the four entries relating to the transaction are all recorded in the capital account. Two relate to the transfer of wealth implied by a capital transfer; the other two are shown as disposal of the asset being transferred by the donor and its acquisition by the recipient.”

(37) SNA 22.103: “When the goods and services and associated delivery charges are donated by government, NPISHs or households, the items are negative final consumption matching a transfer in kind. If the items are provided by corporations, they are recorded as a transfer in cash followed by a purchase of the goods by the recipient. In both cases the items involved are included in exports of the donor country and imports of the recipient country.”

Example b above gets more complicated when the training of the clinic staff is not done by internationals but fully or partly by producers belonging to the recipient's economy. Similarly, any goods or services provided for the capital formation, e.g. services of ownership transfer, or for the trainings, e.g. electricity, stationery and the like, may originate from the beneficiary country itself. In this case, it depends on whether the donor purchases such goods or services (from the view of the beneficiary exports) and subsequently exports them (services) or transfers them (capital goods) or whether this is paid by the recipient out of the current international transfer from the donor to the beneficiary country.

4.7. General government and the “public sector”

The boundary of general government sector and its sub-sectoring is defined in detail in the SNA 4.127 ff. Sometimes, government units are given a certain kind of autonomy by law or by deliberate political decision, with an own budget and outside the roof (but not necessarily outside the supervision) of a ministry, often called autonomous bodies. Examples are authorities for managing public highways, public universities or government agencies for bundling the management of government assets and inventories, usually with a separate fiscal budget, hence also called one-line budget units (because in the main budget of the government they are represented by only one figure: the balancing item of all revenues and expenses of their separate budget). In GFS, they are called extra-budgetary units.³⁸ Some countries are giving such kind of autonomy even to their statistical offices, intending to strengthen their political neutrality and impartiality.

Some of these autonomous bodies have considerable amount of revenues, e.g. highway authorities charging fees for using motorways or water authorities providing water for households or for irrigation systems against pay. They may be assessed as market producers and then consequently be quasi-corporations, hence belonging to the non-financial corporations' sector. In the SNA, the respective yardstick is that they charge “significant prices”, i.e. “prices that have a significant effect on the amounts that producers are willing to supply and on the amounts purchasers wish to buy” (SNA 22.28). For the countries of the European Union, Eurostat has developed a definition which is more operational. According to the European System of Accounts (ESA), prices are economically significant when they fulfil “a quantitative criterion (the 50 % criterion), using the ratio of sales to production costs. To be a market producer, the unit shall cover at least 50 % of its costs by its sales over a sustained multi-year period”.³⁹

For the African countries, no such operational guidelines are given. Finally, each country must assess its government units, autonomous bodies or not, one by one whether they are to be classified as market or as non-market producers.

The central banks are special cases. By definition (SNA 4.104), they belong to the financial corporations' sector. For more details see annex 12.3.5.

To illustrate the full impact of government on the economy, the SNA recommends forming a sector consisting of all the units of general government and all public corporations. In the SNA, this composite sector is referred to as the public sector. It includes general government sector and public corporations (financial or non-financial), including the quasi-corporations. In its scope, it goes beyond the sector general government. In other words: all general government belongs to the public sector but not all of the public sector belongs to general government.

⁽³⁸⁾ GFS Manual 2014, par. 2.14

⁽³⁹⁾ Eurostat, European System of National Accounts 2010, par. 3.19

5.

NGOs in the National Accounts

For developing countries, non-government organizations (NGOs) play an important role providing non-market services, implementing technical assistance, and/or providing humanitarian aid, be it on behalf of donors or on behalf of the Government. Governments may use NGOs for implementing their policy decisions out of government funds, possibly stemming from on-budget donor support. When they do so, the respective payment to the NGO is recorded as a transfer to them rather than as a purchase of goods or services. Under uses, the respective output of the NGOs is non-market in nature and is recorded as final consumption expenditures of Non-Profit Institutions Serving Households (NPISH).

NON-PROFIT INSTITUTIONS (NPIS)

Non-profit institutions (NPIS)		
Market producer	Government controlled	NPIs serving households (NPISH)
NPIs serving enterprises as associations, chambers of commerce and the like	NPIs belonging to the institutional sector general government. Examples are autonomous public universities, research institutes etc.	NPIs belonging to the institutional sector general government. Examples are autonomous public universities, research institutes etc.

NGOs, often indiscriminately confused with Non-Profit Institutions (NPIs) at large, are not a category explicitly recognized and defined in the SNA. Despite its very common acronym, the SNA does not even use the term “non-government organization”. It instead differentiates between three kinds of NPIs:

- NPIs serving enterprises are allocated to the corporations’ sectors. Their revenues are regarded as a reward for a service, and thus they are also market producers. Examples are business associations or agencies acting on behalf of their members rather than striving for a profit on their own.
- NPIs controlled by the government, for instance chambers of commerce or research institutes, are allocated to the institutional sector general government and treated as non-market producers.
- NPIs not controlled by the government and not serving business purposes are assumed to serve human beings, thus NPISH. Examples are sports clubs, churches, political parties, or all what is commonly called “non-government organization” (NGO). By SNA convention, they are non-market producers and constitute an institutional sector of their own.

Usually, NPISH output is recorded as non-market, fully used as final consumption expenditure of the NPISH.⁴⁰

(40) NPISH may have market output (e.g. in clinics or schools where they charge significant prices for work done) and / or small amounts of sales of non-market output.

6.

Imports and exports

6.1. Imports and exports: compliance with BOP matters

Five relevant international guidelines are now fully reconciled with each other. They are (i) the SNA 2008, (ii) the Balance of Payments Manual BOP 6, (iii) the IMF’s Government Finance Statistics Manual 2014, (iv) the International Merchandise Trade Statistics Manual 2010,⁴¹ and (v) the Manual on Statistics in International Trade in Services 2010.⁴² It is therefore consequent and imperative that National Accounts compilation must use BOP, Government Financial Statistics (GFS), and external trade statistics, and must make their figures match with them, as far as possible. This is especially true for treatment of borderline cases of doubts about inclusion in or exclusion from GDP, such as inclusion or exclusion of smuggling or other illegal cross-border transactions. Consequently, the method for compiling the trade balance in GDP calculation is now compatible with the one in the BOP.

The BOP figures for each country can be retrieved from the IMF source <http://data.imf.org/>. An example for the BOP structure is given for Tanzania 2017 below. The columns for “rows” and “calculation” and the last row for the zero-sum check have been added for the explanatory purpose of this manual. They may help to understand the logic and the structure of the BOP.

(41) United Nations, *International Merchandise Trade Statistics, Concepts and Definitions 2010*.

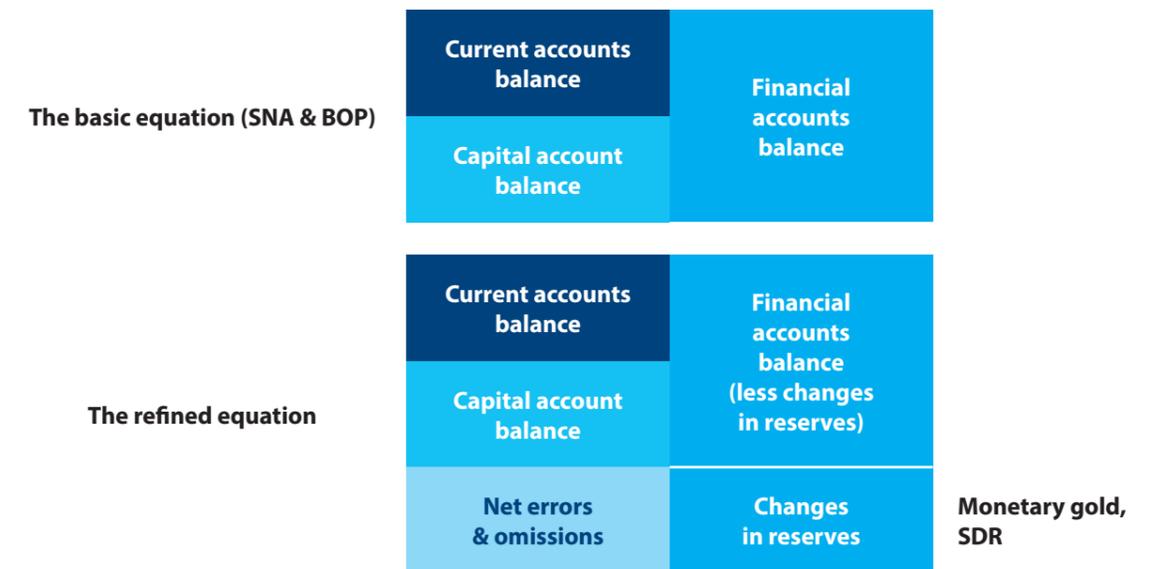
(42) The editors are the same as the ones for the SNA (UN, Eurostat, OECD, IMF) plus UNCTAD, WTO, and the World Tourism Organization

Row	Tanzania, Balance of Payments (Millions of US\$)	2017	Calculation (rows)
1	Current account (excludes reserves and related items)	-1.634	10 + 11 - 12
2	Goods, credit (exports)	4.898	
3	Goods, debit (imports)	7.552	
4	Balance on goods	-2.653	2 - 3
5	Services, credit (exports)	3.850	
6	Services, debit (imports)	2.018	
7	Balance on goods and services	-822	4 + 5 - 6
8	Primary income, credit	125	
9	Primary income, debit	1.339	
10	Balance on goods, services, and primary income	-2.036	7 + 8 - 9
11	Secondary income, credit	485	
12	Secondary income, debit	83	
13	Capital account (excludes reserves and related items)	351	14 - 15
14	Capital account, credit	351	
15	Capital account, debit	0	
16	Balance on current and capital account	-1.283	1 + 13
17	Financial account (excludes reserves and related items)	-2.358	
18	Balance on current, capital, and financial account	1.075	1 + 13 - 16
19	Net errors and omissions	552	
20	Reserves and related items	1.627	
	<i>Check (rows 18 - 20 + 19 must be zero)</i>	0	

It should be noted that the figures for the goods are according to valuation fob (free on board). For more details, see section 6.3.

Often, the meaning of the term “balance” in the context of the BOP is unclear. In the scheme below, the basic equation is given as current account balance plus capital account balance must be equal to the balance of the financial account. This holds for BOP as well as for the National Accounts. But in the usual IMF presentation of the BOP (here called the “refined equation”), the financial account is subdivided into reserve assets and those assets which all institutional units, not only the central banks, may transact in. Moreover, the empirical discrepancy, called “net errors and omissions”, is also shown.

BOP: what does “balance” mean?



The BOP is balanced by definition. But often the changes (!) in the “reserves” are commented as an indicator for “imbalance”.

Hence, speaking of an “imbalance” in the BOP usually refers to the changes in the reserves which mainly are monetary gold and special drawing rights.

Imports and exports are commonly calculated for countries. When GDP calculation is made for regions below (Regional Accounts) or above the national level (like the African Regional Economic Communities, RECs, or currency unions), then the calculation of imports and exports needs special attention. For the Regional Accounts, recording of imports and exports is possible by concept but impossible in practice because all deliveries between the sub-national regions would also fall under imports and exports. But they would not be traceable by any statistics. For the supra-national accounts, it is the other way around: cross-border transactions between countries belonging to the same REC or monetary union, respectively, must be consolidated (which means erased).

6.2. Imports of goods: sources and measurement

In Africa, three world-wide international tools for the collection of data on external trade are in common use. One is ASYCUDA, a computerised customs management system which covers most foreign trade procedures, including those being active in Africa. The system handles manifests and customs declarations, accounting procedures, transit and suspense procedures. It generates trade data that can be used for statistical economic analysis. The ASYCUDA software (French name SYDONIA) is developed in Geneva by UNCTAD but is an Africa-born system, first developed for the ECOWAS region.⁴³

(43) Source: <https://asycuda.org/en/>

ASYCUDA takes into account the international codes and standards developed by ISO (International Organisation for Standardisation), WCO (World Customs Organization), and the United Nations. It can be configured to suit the national characteristics of individual customs regimes. ASYCUDA provides Electronic Data Interchange (EDI) between traders and Customs using prevailing standards such as XML. Many African countries have implemented the ASYCUDA system for their customs authorities.⁴⁴

While ASYCUDA is mainly made for digitization of forwarding procedures and of customs administration, the EUROTRACE software is closer to statistics. It is an application for collection, compilation and dissemination of external trade data at national and regional level. It can be adapted to national, regional requirements and to most types of statistics. It is developed by Eurostat. AUC through the PAS project and Eurostat support the upgrading of this software from the ACCESS version to the SQL server one in various African countries. More details can be found under <https://ec.europa.eu/eurostat/web/international-statistical-cooperation-tools/capacity-building-tools/eurotrace>.

For the retrieving of data on imports and exports of goods in deeper detail than in the BOP, there is also an international tool, developed by United Nations Conference on Trade and Development (UNCTAD), the main UN body dealing with trade. This tool, UN Comtrade, is a repository of official international trade statistics and relevant analytical tables. Its International Trade Statistics Yearbook⁴⁵ provides an overview of the latest trends of trade in goods and services showing country and product profiles of international trade, respectively. Beginning with 2017 edition, part 1 of the yearbook was completely redesigned to consider new additions of graphs, tables and analytical text for global, regional and selected trade or economic groupings (source: <https://comtrade.un.org/>).

The Comtrade database provides figures for all countries in the world but for some of them based only on estimates. For several African countries, mismatches were found between country's own data and the respective Comtrade figures. Therefore, the African Union has started an annual time-series of trade yearbooks on its own, striving for providing data which authentically stem from the countries themselves rather than from Comtrade or

other international sources. The AU-publication can be found under <https://au.int/en/documents/20180917/african-trade-statistics-yearbook-2017>.

The AU is also co-editor of the Annual Statistical Yearbook for Africa⁴⁶ which, beside many other data, also provides imports and exports figures, still widely based on Comtrade data. The intention is to replace these data by the ones reported by the countries themselves, also.

6.3. Imports and exports of goods

In most countries, including the African ones, the data for imports and exports of goods stem from secondary sources given by their customs authorities as an output of the tools described in the previous section. The respective statistics is commonly named as “merchandise trade statistics” when produced and / or published by the statistical offices. It provides the data by country of origin (imports) and country of destination (exports). The common international classification for the imports or exports of goods is the Harmonized Commodity Description and Coding Systems, or short Harmonized System (HS) developed by the World Customs Organisation.⁴⁷ The HS comprises approximately 5,300 article/product descriptions that appear as headings and subheadings, arranged in 99 chapters, grouped in 21 sections. The National Accounts do not use this classification. But bridge tables from the HS to the Central Product Classification (CPC), the common classification for products in the NA, are available at UNSD website.⁴⁸

As far as the imports are concerned, the valuation of the goods in the merchandise trade statistics imposes problems to the National Accounts. The imports are recorded as valued at the point of entrance to the importing country. This means inclusion of the cost for insurance and freight up to the border (“cif”-values: cost, insurance, freight). The exports, however, are recorded “free on board” (fob) which means including only the transport cost of the exporter up to the border of his country. A numerical example of an export of a Toyota car from Tokyo to a purchaser in Addis Ababa shall illustrate this (figures in US\$):

Example: steps of an import of a Toyota car for a customer in Addis Ababa	Amount / Value
Price of car at factory gate Toyota	30,000
Local transport / insurance from Tokyo to Japan border	500
Japan's export value fob	30,500
International transport from Japanese to Ethiopian border	4,500
Of which by domestic carriers	1,500
Of which by foreign carriers	3,000
Insurance for international transport	500
Of which by domestic insurances	200
Of which by foreign insurances	300
Ethiopia's import value of goods fob	30,500
Ethiopia's import value of goods cif	35,500
Local transport / insurance from Ethiopian border to Addis	300
Value of car at entrance of car vendor in Addis Ababa	35,800
Purchasers' price for customer	40,000

In the SNA as well as in the BOP, imports as well as exports are valued fob. The main reason is that the exports then (theoretically) tally with the respective imports which makes the analysis of international trade developments much easier. The second reason is that the cif-values include elements of double-counting for the importing country: the international transport between the borders of the exporting and the importing country is recorded as import of transport services of the receiving economy, regardless whether made by international carriers or by national transporters.⁴⁹ In the case of national transporters, this kind of transport service is domestic output dedicated for export. It is a kind of gross recording: if all the international transports would be made by national carriers, the net imports of such transport services would be zero. For the insurance of the transports, the situation is analogous.

The conversion of the figures for the imports of goods at cif values to the fob values imposes problems as usually the merchandise trade statistics do not provide the necessary information for a proper calculation per good. Most countries can only make a lump-sum estimate. For this purpose, the imports are split by country of origin. For the neighbouring countries, the cif value of imports should at least conceptually be identical with the respective fob value of the exporting country as there is no

space between them which would require international transport. The extinction of double counting is confined to the imports from the non-neighbouring countries.

In all countries, not only in those where GDP is also shown from the expenditure side (which requires showing imports and exports), the compilers of the BOP must also cope with this problem. They have a comparative advantage for that as they are also responsible for compiling the imports and exports in services. Their main data source is the International transactions reporting system (ITRS) which records individual international payments passing through the banking system.

Hence, the producers of the National Accounts may adopt the BOP figures or at least reconcile with them. However, when the imports of goods and services are to be shown item wise, as it is the case in a SUT, it needs a more sophisticated cif-fob adjustment as the data on imports of goods are only available at cif values. This is tackled in section 6.5 below.

The international transport cost must not be confused with transport margins, which only represent transport inside the economy.

(44) Source: <https://unctad.org/en/pages/PressReleaseArchive.aspx?ReferenceDocId=2462>

(45) Volume I – Trade by Country and Volume II – Trade by Product

(46) <https://www.uneca.org/publications/serie/african-statistical-yearbook>

(47) http://www.wcoomd.org/home_wco_topics_hsoverviewboxes.htm

(48) <https://unstats.un.org/unsd/classifications/econ/>

(49) SNA 14.72: “If the importer undertakes delivery itself or contracts with a unit resident in the same economy, there is in fact no import of services even though it will appear there when imports of goods are recorded CIF. To counteract this, a fictional export of the same amount of services must be shown to leave the current balance of goods and services correct.”

6.4. Imports and exports of services

The National Account figures for exports and imports of services are compiled separately from those of the goods. Merchandise trade statistics are confined to goods and does not give details on services. The data source is the BOP as published by the IMF or the central bank of the respective country. Imports of services are classified as shown in the table with figures taken again from Tanzania's BOP. "Credits" stand for exports and "debit" for imports of services.

Tanzania, BOP excerpt for services (Millions of U.S. dollars)	2017
Current account	-1.633,7
Goods and services	-821,7
Goods	-2.653,4
Services	1.831,7
Credit	3.849,6
Debit	2.017,9
Transport, credit	1.147,9
Passenger	22,7
Freight	989,4
Other (including postal and courier)	135,8
Transport, debit	778,3
Passenger	92,2
Freight	674,6
Other (including postal and courier)	11,5
Travel, credit	2.261,2
Business travel, credit	0,0
Personal travel, credit	2.261,2
Travel, debit	807,3
Business travel, debit	0,0
Personal travel, debit	807,3
Other services, credit	440,5
Construction services	0,0
Insurance and pension services	35,9
Financial services	27,7
Charges for the use of intellectual property n.i.e.	0,1
Telecommunication, computer, and information services	16,0
Other business services	339,9
Personal, cultural, and recreational services	1,0
Government goods and services n.i.e.	20,0
Other Services, debit	432,3
Construction services	39,2
Insurance and pension services	37,1
Financial services	13,9
Charges for the use of intellectual property n.i.e.	3,8
Telecommunication, computer, and information services	26,2
Other business services	243,3
Personal, cultural, and recreational services	3,0
Government goods and services n.i.e.	65,7

Two positions may need explanation: construction services and government services. Construction work is usually not perceived as a service activity, while government services are expected to be used inside the realm of the government. In case of construction, services exports or imports are confined to activities not lasting longer than one year, often not constituting GFCF (see section 9.6). Examples for export or import of government services are services provided to international organizations residing inside the country's territory or services provided to foreign companies; for instance, aviation control services consumed by foreign airlines.

In the BOP, services of exports are classified in the same structure.

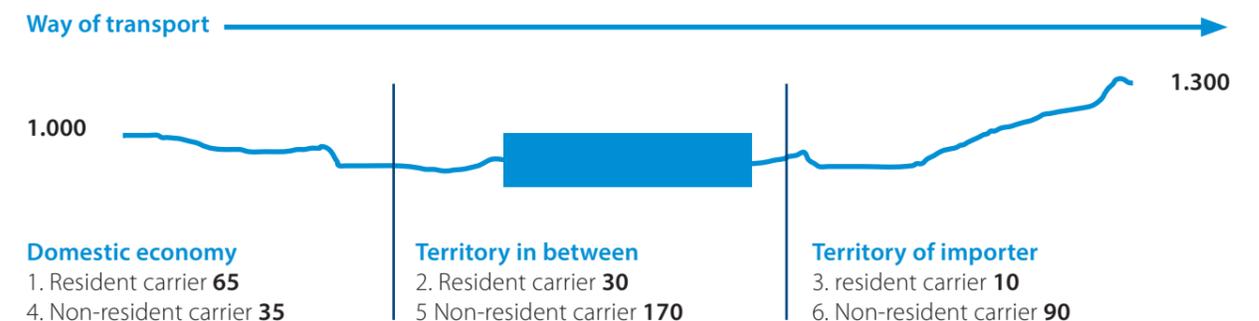
6.5. Cif-fob adjustment

6.5.1. Numerical example with different cases of transport

As already mentioned in section 6.3, in the SNA as well as in the BOP, imports as well as the exports are recorded as fob-values. This may first be illustrated in examples, first for exports and then for imports.

The example foresees that on all three possible route sections of the transport – inside the exporter's country, inside the importer's country and in the international space in between, possibly even including an ocean – the transport is carried out by some resident (domestic) carriers and by some non-resident (foreign) carriers.

Export of goods (initial value 1000) in 6 cases of transport



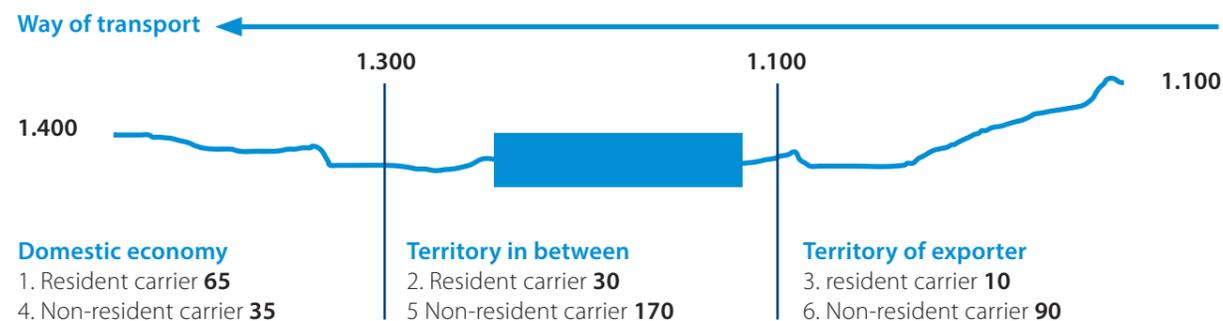
The table shows the recording. In case 4, the exporting economy imports the transport service from a foreign carrier in amount of 35. Nevertheless, the export value of goods includes this service because it is prior to the moment of passing the border and the customs.

Case	Exports goods fob	Import of services	Exports of services	Domestic output
Start	1.000	-	-	1.000
1	65	-	-	65
2	-	-	30	30
3	-	-	10	10
4	35	-35	-	-
5	-	-	-	-
6	-	-	-	-
Total	1.100	35	40	1.105

The domestic country's exports (fob) are 1.135 (goods plus services). In terms of its supply and uses, the supply is identical with the domestic output (1.105) plus the import of services (35), resulting in 1.140. The use side shows intermediate uses of domestic transport services (65) and of imported transport services (35) plus the exports of goods (1.000) and of transport services (40). Hence, as required, supply equals use (1.140).

In case of the analogous example for the imports (with same figures for the cases 1 to 6, but opposite way of transport and the domestic economy being the importing country), we see from the figures in the table the different components of the values cif and fob.

Import of goods (initial value 1000) in 6 cases of transport



The table shows show imports of goods at fob-values of 1.100, including the value of transport done by domestic / resident carriers (case 3) in amount of 10). These transport services are also recorded as an export of services of the domestic economy to the exporting country.

Case	Exports goods fob	Import of services	Exports of services	Domestic output	Domestic output
Start	1.000	-	1.000	-	-
1	-	-	-	-	65
2	-	30	30	30	30
3	10	-	10	10	10
4	-	35	-	-	-
5	-	170	170	-	-
6	90	-	90	-	-
Total	1.100	235	1.300	40	105

In case 2, the international transport between exporting and importing country is also provided by domestic transporters, also balanced by an imputed export of services. For the reason, see footnote 49. Finally, the import value of goods (cif) results from the values fob plus the transport services given in case 2 and 5. The imports of services also include case 4 which is a transport inside the domestic economy and hence is not included in the cif-value of the imports of the goods.

In terms of the domestic country's supply and uses, the supply is imports cif (1.300) plus imports of services outside the cif-valuation (35) and plus output of transport services (105) minus a global cif-fob correction for the double-counting. In this example, the double counting is with domestic transport services of cases 2 and 3 as well as with the imports of transport services in case 5 (in total 200). Finally, after subtracting the (global) cif-fob adjustment of 200, total supply results in 1.240. The cif-fob adjustment of the total imports of goods is balanced by a reduction of the transport services in same amount.

The uses are those of the imported goods (for intermediate or final uses inside the importing economy) in amount of 1.300 plus imports of transport services outside the cif-valuation (case 4, in amount of 35) plus the output of services (105), reduced by the global cif-fob adjustment (200). As required, supply equals use (1.240).

6.5.2. Summarizing the rules

When transport and insurance services included in the f.o.b. value of imports of goods (i.e. between the factory and the border of the country of export) are provided by resident units, they must be included in the value of exports of services by the economy importing the goods (see footnote 49). Conversely, when transport and insurance services included in the f.o.b. value of exports of goods are provided by non-resident units, they must be included in the value of imports of services by the economy exporting the goods.

Converting the imports of goods cif into fob values requires splitting the recorded values by their components in the following way:

1. For imports, costs for freight and insurance up to the border of the importing country are shown as import of services.
2. For exports, fob values only include the freight and insurance cost for transport up to the border of the exporting countries. Any cost for transports between non-neighbouring countries is recorded as international services.

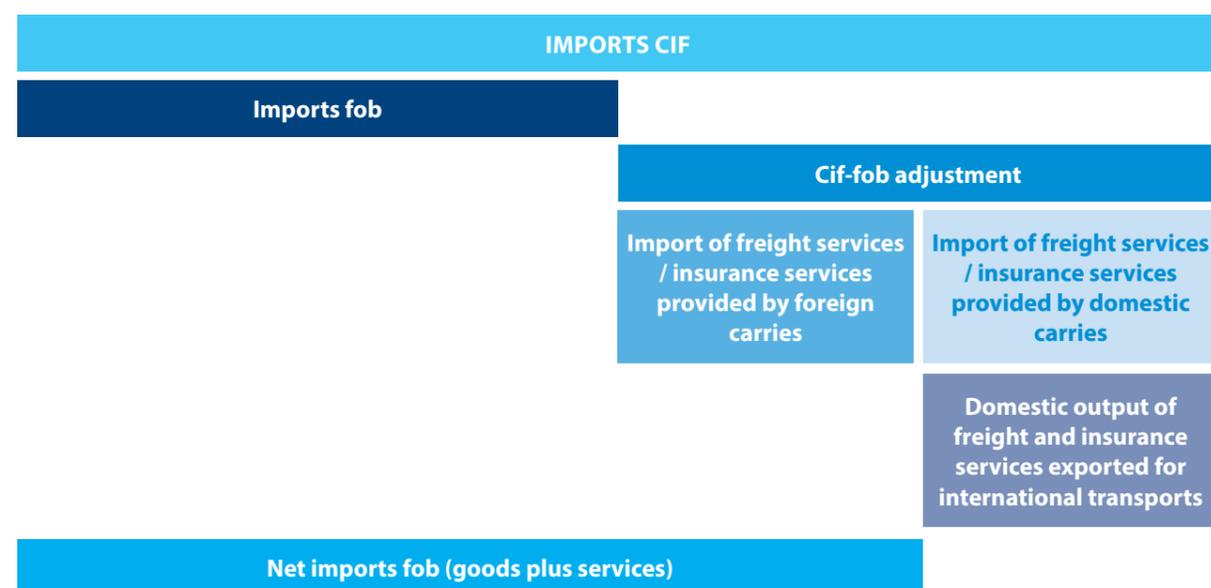
This rule of recording is not easy to implement in a supply and use framework where imports are disaggregated in detail (which, for empirical reasons, is only possible with cif values). It needs global correction, which in the SNA is called "cif-fob adjustment". It avoids double counting freight or insurance expenditures on imports as the transport and insurance services are also incorporated in the values of the imports (which in breakdown by commodities is cif). Services linked to imports or exports of goods are captured as supply of the respective ISIC position (transport services or insurance services, respectively). They are provided either by domestic or by foreign carriers or insurers.

In the SUT, a special column would capture the cif-fob adjustment row-by-row by listed commodity. But it may be considered to make use of an SNA proposal (par. 28.12)⁵⁰ for a simplified solution with a global adjustment.

In adopting it, we only make sure that total imports match BOP recording of total imports of total goods and services. The cif-fob adjustment is implemented for freight and insurance services, irrespective of whether provided by domestic or by foreign producers. For domestic producers, the adjustment avoids double counting with the respective domestic output. For foreign producers, the cif-fob adjustment avoids double-counting with the imports of the respective services.

(50) "28.12 A simpler procedure than that just described, though one not strictly consistent with BPM6 recommendations, is to ignore the balance of payments division between goods and services and adjust the figures for imports of services by the amount of services provided by non-residents that are included in the detailed figures for imports of goods. This ensures that the total of imports of goods and services agrees with the total in the balance of payments but will not agree with the total of imports of goods FOB and of services shown there. This makes compiling the supply and use tables simpler but means that it is not possible to use imports of goods on a FOB basis to match exports of those goods from other countries. Even in this simpler version, however, the amount of freight and insurance on imports provided by residents must be shown as an export of services."

Cif-fob adjustment in a scheme



For total imports, the BOP records “goods and services, debit”. In National Accounts, we reconcile with this figure, but we do not correct the imports of each good (which from the merchandise trade data source we only have at cif values) individually one by one. Our “cif-fob adjustment” is done by two lump-sum corrections. The SNA speaks of “global” cif-fob adjustment. In the SUT, they are made in the column for the cif-fob adjustment.

- Costs for freight are estimated as a certain percentage of cif-values. It is assumed that the international freight for transport from directly neighbouring countries is nil, while international transport from non-neighbouring countries averages, for example, 20 percent of cif-values of the respective imports. This can be done country-wise or (a bit easier) as a weighted average, varying from country to country and depending on the geographical and logistical proximity to their main countries of origin of imports. The BOP Compilation Guide (5.22 f.) gives some general recommendations for estimates, proposing to make sample surveys.

- Estimated transport service values levied on all imports are recorded with a minus in the column for cif-fob adjustment and in the row for the transport services.

- Like transport, costs for insurance are estimated as a percentage of cif-values. The same split between neighbouring and non-neighbouring countries is applied. However, the insurance rate for non-neighbouring countries is much less, possibly around 2 percent. The estimated values of insurance services levied on all imports of goods are recorded with a minus in the column for cif-fob adjustment and in the row for the insurance services.

For balancing the cif-fob adjustment, a separate row is inserted, also called cif-fob adjustment. It balances the column cif-fob with recording the total of the global cif-fob adjustment with a positive sign, bringing the total of the cif-fob column to zero. The total of the row for cif-fob adjustment is also brought to zero by a negative entry in same amount in column imports. As a result, the total of imports shows the fob value as required for GDP and for the BOP.

6.5.3. The cif-ob adjustment in the SUT structure (numerical example)

Using the example of the exports of Toyota car from Japan to Ethiopia in section 6.3 may help to better understand this recording. We compile a drastically reduced SUT with

only the transactions related to the Toyota case. If, like in the example, we would know all details, we would not need the cif-fob adjustment and we would record as shown in the upper of the two following tables. Please note that the output of the domestic carriers for the international part of the transport are recorded as exports (provision to the foreign exporter) as well as imports (part of cif value). For the reason, see footnote 49.

The Toyota case in a drastically reduced SUT (no cif-fob adjustment)

Output	SUPPLY			PRODUCT	USES	
	Import	Cif-fob adjustment	Total		Final cons	Export
-	30,500		30,500	Toyota car	30,500	
300			300	Local transport	300	
1,500	4,500		6,000	Intern. transp.	4,500	1,500
200	500		700	Insurance	500	200
4,200			4,200	Trade	4,200	
				Cif-fob adjustment		
6,200	35,500		41,700	Total	40,000	1,700

But in practice, we only know the cif-value of the Toyota import, the domestic output of transport and insurance services and the imports and exports of transport and insurance services in global amount. We record as follows:

The Toyota case in a drastically reduced SUT (using cif-fob adjustment)

Output	SUPPLY			PRODUCT	USES	
	Import	Cif-fob adjustment	Total		Final cons	Export
-	35,500		35,500	Toyota car	35,500	
300			300	Local transport	300	
1,500	4,500	-4,500	1,500	Intern. transp.	-	1,500
200	500	-500	200	Insurance	-	200
4,200			4,200	Trade	4,200	
	-5,000	5,000	0	Cif-fob adjustment		
6,200	35,500	0	41,700	Total	40,000	1,700

The effects can be seen by comparing the two tables. In both, the total of imports is the fob value of the imports of goods and of services. The net amount of imports fob would be 33,700 (balanced with the exports of the transport services). In the upper one, the double counting has correctly been reduced with the import of the Toyota. In the lower table, the correction by the cif-fob adjustment is made with the services of insurance and transport, instead. As a consequence, the structure of the imports is different: in the upper table, the relation is 30,500 to 5,000 while in the lower one it is 35,500 to 5,000. Hence, the cif-fob adjustment made in a lump sum (SNA: “global”) does not fully match the situation where the cif-fob adjustment is made product-wise. But this small disadvantage is tolerable given the fact that the proper decomposition of the cif imports is not possible.

7.

Capturing the informal sector

7.1. “Informal” versus “non-observed” in the SNA and in other international guidelines

Throughout the SNA, its recommendations aim at ensuring exhaustiveness in capturing economic activities which fall into the production boundary. Two different terms have emerged for those activities which must not be forgotten or overlooked in compiling the GDP. One is “non-observed economy”, the other is “informal economy” or “informal sector”. The new SNA has dedicated a full, albeit small, chapter on the “informal aspects of the economy” (chapter 25), in its title avoiding the term “sector” and speaking of “aspects”, instead. This is for good reasons as in the SNA the term “sector” is reserved for the five institutional sectors in the system.

But the SNA concedes that for the developing countries identifying an “informal sector” can be relevant and can pose a problem (SNA 25.28). As indicated in the chapter’s title, this manual consciously uses the term informal “sector” as it is deeply embedded in the technical parlour of the compilers of the National Accounts in Africa. The term is well known among them and among the relevant users. All of them know that it must not be confused with the institutional sectors of the system. But even for the practitioners, it is often disputed what is covered by the informal “sector” and what is not. Hence, all related terms should be used carefully.

In its chapter 25, the SNA mainly provides definitions and some clarifications for the identification of units and sectors. In a short sub-chapter (25 C), the SNA defines the “non-observed” economy. Its first paragraph (25.38) can be interpreted that, for the sake of “exhaustiveness”, the SNA considers it relevant to define the “non-observed” economy, while for the definition of the “informal sector” it just replicates the definition given by the ILO and explains and outlines it in sub-chapter 25 D.

Very briefly, the SNA defines the non-observed economy as “the extent of economic activity missing from statistical data collection and from administrative sources”. Given this definition, even units which, like special purpose units of off-shore banking (see 9.13), are – by their very intention – extremely formalized legal construction, would possibly fall under “non-observed” economy.

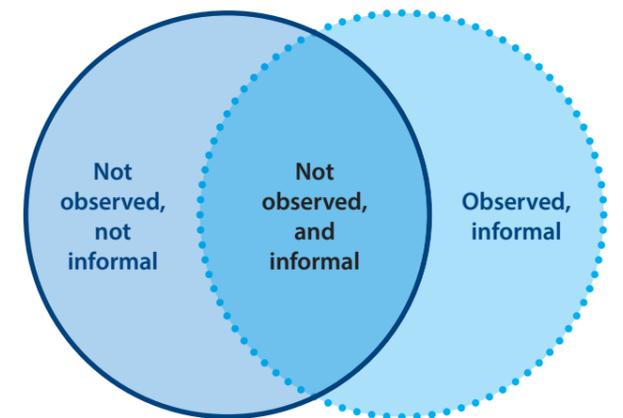
The ILO-definition⁵¹ for the informal sector is as follows (SNA 25.36):

“The informal sector may be broadly characterized as consisting of units engaged in the production of goods or services with the primary objective of generating employment and incomes to the persons concerned. These units typically operate at a low level of organization, with little or no division between labour and capital as factors of production and on a small scale. Labour relations - where they exist - are based mostly on casual employment, kinship or personal and social relations rather than contractual arrangements with formal guarantees.

Production units of the informal sector have the characteristic features of household enterprises. The fixed and other assets used do not belong to the production units as such but to their owners. The units as such cannot engage in transactions or enter into contracts with other units, nor incur liabilities, on their own behalf. The owners have to raise the necessary finance at their own risk and are personally liable, without limit, for any debts or obligations incurred in the production process. Expenditure for production is often indistinguishable from household expenditure. Similarly, capital goods such as buildings or vehicles may be used indistinguishably for business and household purposes.”

The section about “approaches to measuring activities undertaken in the informal economy” is quite short and confined to some recommendations for household surveys, establishment surveys and mixed household-enterprise surveys.

The SNA (25.1) sees two different approaches to ensure activities which may be subsumed under “informal sector”. One is to ensure that all “hidden” or “underground” activities are captured. The other approach is to measure all economic activities which are “informal”. The part of the economy difficult to measure has become known as the Non-Observed Economy (NOE). In its figure 25.1, the SNA visualizes the overlap between both approaches:



SNA 25.4: “The solid circle represents the non-observed economy and the dotted circle the informal sector. Thus, the overlap consists of activities that are not observed and undertaken informally but there are some activities that are not observed but are not undertaken informally and some that are undertaken informally but are observed. The relative size of the three segments... will vary from country to country”. The SNA provides some examples for each of the three segments in the graph. For the overlapping segment (not observed and informal) it sees street traders, taxi drivers or small vehicle repair shops as typical examples. But it emphasizes that this assessment may vary from country to country.

One may argue that it is not quite clear what “observed” really means. Does it aim at the producing unit as such or just at its output or just at some factors of production like land or employment? In agriculture, for example, the crop production in meanwhile many countries is accurately observed via satellite imaging techniques while the farms are not known and not even bothered with the collection of their data (see also section 3.3). Similarly, it might be doubtful whether the services of owner-occupied dwellings are “observed” when their figure is delineated from a housing census.

The SNA does not care so much about whether activities are formal or informal. It quotes the handbook “Measuring the Non-Observed Economy” edited by OECD, IMF, ILO and CIS STAT 2002⁵² which also emphasizes that “a specific measure of the NOE is not important in itself. Attention focusses on ensuring that the measurement of total activity is complete or ‘exhaustive’” (SNA 25.2).

(51) Strictly speaking, it is the resolution of the 15th International Conference of Labour Statisticians (ILCS) adopted by the ILO (see also SN 25.13). “The ILO work is pragmatic in realizing that it is very difficult to establish a definition of the informal sector that is strictly comparable across countries given the difference in the structure of micro and small enterprises, the national legislation covering registration of enterprises and the labour laws.” (SNA 25.14)

(52) <https://www.oecd.org/sdd/na/measuringthenon-observedeconomy-ahandbook.htm>

But for many African countries, the identification of an “informal sector” and quantifying its relevance, e.g. as its share in the country’s GDP, is an important by-product of their National Accounts. For the overall quality of their National Accounts, the estimates for the non-observed economy is paramount as subsistence agriculture, small scale manufacturing, cross-border trade and other forms of small-scale business or unobserved economic activities, be they licit or illicit, usually play an important role. But it is not only the striving for being exhaustive in capturing the GDP. For some countries, it is also important to show the informal sector as a sub-aggregate of the economy, just because of its paramount relevance for sound economic analysis and for political measures directed towards those parts of the economy which are vulnerable especially with regard to decent employment and to inclusive growth. One example (Cameroon) for dedicatedly reporting about the informal sector is given in section 7.4.1 below.

Countries which do not explicitly show an “informal sector” and which also do not compile the institutional sector accounts and possibly do not even care so much about properly specifying the kinds of units in their economy, must, nevertheless, heed the important points of chapter 25 of the SNA summarized here:

Institutional sectors of the economy

General government	Corporations		Non-profit institutions serving households	Unincorporated enterprises of households	
	financial	non-financial		formal	informal
Formal sector of the economy					Informal sector

It is therefore consequent for surveys on the informal economy such as the Household Standard of Living Conditions Surveys or the Survey 1-2-3- on Employment in the Informal Sector to use sample designs building upon households as respondents or to integrate them as a separate module into other household surveys. However, it should be noted that the household sector as defined in the SNA also includes unincorporated enterprises which can be formal and even large.

• The SNA carefully mentions the argument that, in principle, a well-balanced SUT is a good prerequisite that informal activities are captured. But it does not see a SUT as a guarantee for it: “While it is possible that something may be omitted, if the tables are to balance, there must be exactly matching omissions in other aspects of the accounts, which is not very likely. However, while the act

• The SNA elaborates differences between the “non-observed” economy and the “informal” one, emphasizing that activities can be (i) informal but observed or (ii) formal but unobserved or (iii) informal as well as unobserved, the latter combination being the one usually perceived as the “informal” economy or “sector”.

• The SNA emphasizes that there is no strict dichotomy between formal and informal. The SNA does not define a “formal sector”, though it is not difficult to subsume into it all units in the corporations’ sectors, general government and NPISHs as far as production is concerned (SNA 25.52). But besides of formal and informal sector, there are the unincorporated enterprises of the households which are formal but, nevertheless, remain outside this definition of a formal sector. Hence, despite of its name, the informal sector is not another institutional sector like households, general government, NPISH and the corporations. Given that either single persons (outworkers) or unincorporated enterprises of households are doing the work, the informal sector can be seen as a sub-component of “households”.

of balancing the tables may in effect estimate some non-observed activity, it may not be sufficient to capture all of it.” (SNA 25.33)

• The SNA emphasizes that the criteria for “formal” or for “observed” may vary from country to country. But regardless of all discussions about definitions, the SNA clarifies two points: (i) the services of owner-occupied dwellings do not belong to the informal economy, although carried out as unincorporated enterprises of households (SNA 25.24 and 25.41). Similarly (ii), households producing household services exclusively for own final use, e.g. households employing cooks or gardeners, are excluded from the informal sector (SNA 25.41).

Because of diverse relevance for the countries (high for developing ones and low for industrialized ones), the United Nations Statistics Division has created the so-called “Delhi Group” as one of its “city groups” for special topics. The Delhi Group has been set up as an international forum to exchange experience in the measurement of the informal sector. It shall document the data-collection practices, including definitions and survey methodologies followed by member countries, and it shall recommend measures for improving the quality and comparability of informal sector statistics. Its secretariat is based in Delhi / India. Among their participants are three African countries: Nigeria, Zambia, Namibia. More details are given in section F of the SNA’s chapter 25 and under the group’s website <https://unstats.un.org/unsd/methodology/citygroups/delhi.cshtml>. However, the present activities of the Delhi Group seem to be low. The latest document originates from 2013.

7.2. Special informal activities

7.2.1. Agriculture

Apart from defining the informal sector, the ILO recommends excluding producing units which purely produce for own final use. It means that the following activities are excluded from the informal sector:

- agricultural production carried out exclusively for subsistence (no sales or barter transactions on the market),
- production of services of owner-occupied dwellings, and
- production of services for own final consumption of households, e.g. services of gardeners, guards, cooks or other domestic staff.

The above-mentioned handbook on the non-observed economy tends to exclude agriculture at all. It recognizes that, from a conceptual point of view, there was nothing against the inclusion of agriculture activities, if they meet the criteria of the definition. But for practical data collection reasons, it recommends excluding agricultural and related activities from the scope of informal sector surveys and measuring them separately. „The reasoning was that many developing countries have a large agricultural sector,

mainly composed of small, unregistered household unincorporated enterprises and that the inclusion of such enterprises in informal sector surveys would lead to considerable expansion of survey operations and increase in costs. Moreover, most national statistical systems already have an established system of agricultural surveys whose coverage includes (or can relatively easily be extended to include) household unincorporated enterprises engaged in agricultural and related activities.” (Handbook Non-Observed Economy 10.32).

About the inclusion or exclusion of agriculture, similar recommendation, at least for conducting surveys on informal employment and activities, has been given by the ILO-Handbook from 2013⁵³, albeit carefully, and acknowledging that some countries decided to include agriculture into the informal economy (see examples in table 2.3 in the ILO-Handbook). The SNA itself refrains from recommendations whether agriculture should belong to the “informal sector” or not.

7.2.2. Informal cross-border trade

The international methodology for recording of trade of goods is defined in the International Manual on Trade Statistics (IMTS)⁵⁴, edited by the United Nations’ Statistics Division (UNSD). According to its definition of general trade system (par. 2.14), “general imports and exports are flows of goods entering/leaving the statistical territory of a country”. There is no doubt that this includes goods of the informal part of cross-border trade. The latest version (2010) does not deal with this part of international trade. However, for the revised version of the IMTS which is under preparation in close reconciliation with the revisions of the SNA and the Balance of Payments Manual, both targeted for 2025, it is planned to foresee clarifications for the informal cross-border trade. As reported by the representative from UNSD in a technical electronic conference on trade statistics in Africa⁵⁵, this has been decided with special regard to the relevance the informal cross-border trade has gained in Africa.

As an add-on to the IMTS, the UNSD also provides an online Compiler Manual. In its chapter 19 (web link: <https://unstats.un.org/wiki/display/I2CG/D.++Cross-border+trade+and+smuggling>), the Manual tackles “cross-border trade and smuggling”. It differs between three cases:

(53) ILO, *Measuring informality: A statistical manual on the informal sector and informal employment*, Geneva 2013

(54) <https://unstats.un.org/unsd/trade/eg-imts/IMTS2010-final-22March2011.pdf>

(55) E-conference of the Expert Group of the SHaSA Special Technical Group “Trade and Balance of Payments”, August 27, 2002, organized by the AUC.

- Goods acquired by all kinds of travellers above a certain value (defined by national law) are often referred to as shuttle trade. Common examples are cars or produce.
- If such goods are traded illegally, e.g. through smuggling or as stolen vehicles, they are, nevertheless, to be included in the trade of goods. The IMTS Manual recommends recording these goods separately.
- Goods in amounts or values that do not exceed limits established by national law are to be treated as part of trade in services.

But the Compilers Manual does not define the informal part of it. Surely, shuttle trade and smuggling are components of it. But in Africa, the cross-border sales of livestock and of crops and wood products often also remain unrecorded. Capturing these data is often extremely difficult as many borders are porous or even militarily disputed, with limited options for administrative interventions or data collection. The techniques for data collection must take into account the characteristics and prevailing habits of the practitioners at the border. Only few countries try to close the data gaps by conducting special surveys. It goes without saying, that data on informal trade must be collected sensitively and by prudent application of sampling tools. For two of the countries doing such efforts, Rwanda and Uganda, the IMF has documented country experiences of recording informal cross-border trade. These experiences are further outlined in sections 7.4.3 and 7.4.4. Other countries also published reports on informal cross-border trade. Among them is Namibia.⁵⁶

For Rwanda⁵⁷, the IMF gave a definition of the Informal Cross Border Trade (ICBT): It “generally refers to imports and exports of legitimately produced goods and services (i.e. legal goods and services), which directly or indirectly escape from the regulatory framework set by the government, and avoid taxes and regulatory measures, hence go unrecorded into official national statistics.”

Initiatives to develop a methodology for capturing informal cross-border trade have also been taken by RECs. COMESA’s “Regional Small-Scale Cross Border Trade Initiative”, funded by the European Union, is designed to address challenges facing small scale traders which include high transactions costs arising from delays at the border, high taxes and high transport costs, corruption and harassment among others. In COMESA region, small cross border trade accounts for 30 to 40% of total trade.⁵⁸

7.3. Informal sector employment

Most informal sector activities are labour intensive where income from labour is often the only source of income of the households of the employees. Moreover, labour in the informal economy is rarely based on formal labour contract, hence it is as difficult to measure as the output. But to some extent, labour in the formal sector may also be informal in the sense that a formal labour contract is missing.

Besides of GDP, the number of persons without a formal job is the most important variable in analysing the development of the informal sector. Consequently, it is mainly the International Labour Organization (ILO) which is masterminding the statistical observation of labour in the informal sector. Like the SNA 1993 and the SNA 2008 and the NOE Handbook, the ILO handbook still refers to the definition of the informal sector which has been elaborated by the 15. International Conference of Labour Statisticians (ILCS) in 1993:

“The informal sector may be broadly characterized as consisting of units engaged in the production of goods or services with the primary objective of generating employment and incomes to the persons concerned. These units typically operate at a low level of organization, with little or no division between labour and capital as factors of production and on a small scale. Labour relations – where they exist – are based mostly on casual employment, kinship or personal and social relations rather than contractual arrangements with formal guarantees.”

The ILO standards are contained in such “resolutions”, which are adopted by sessions of the ILCS. Such resolutions have also been developed for the definition of the “economically active population” or the categories of employees, both also adopted by the SNA in its chapter 19 on “population and labour inputs”. For the sub-classification of the employment in the informal sector, the SNA (25.79) recommends information about the number of jobs as follows:

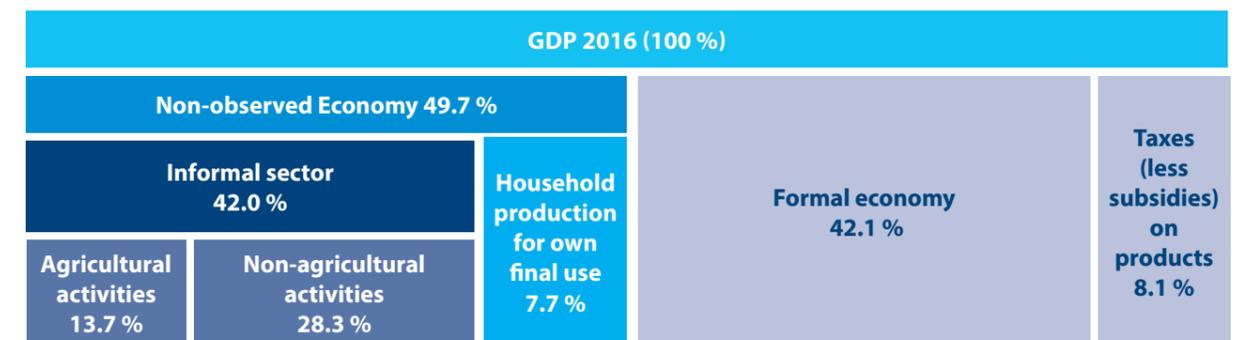
- Employment in the informal sector
 - Formal jobs
 - Informal jobs
 - Informal employment outside the informal sector
 - In the formal sector
 - In other household unincorporated enterprises.
- Moreover, the SNA recommends providing information on the hours worked in each of these categories.

7.4. Country practices

7.4.1. Non-observed economy in Cameroon

Cameroon is one of the African countries which conducts special inquiries of the informal sector and which explicitly publish figures about the informal sector, albeit avoiding the term “informal sector” in the title of the respective

publication.⁵⁹ Its concept is broader: it aims at recording the non-observed economy with the informal sector being part of it. With a little trick, Cameroon avoids a blurred picture with overlaps between “informal” and “observed”. In footnote 2 of its report, it informs: “To fit the purpose of the informal economy, it is assumed in this paper that all informal sector is not observed, though informal agriculture is observed through a regular data collection system.” Hence, the NOE in Cameroon is clearly composed as follows (in brackets the shares of GDP 2016):



The agricultural activities of the informal sector are confined to the subsistence agriculture which caters for 80 % of total value added of the agricultural activity. The non-agricultural activities of the informal sector are mainly made up of manufacturing, transportation and storage and trade, including the repair of motorcycles and motor vehicles. The household production for own final use is made up of the following components:

ISIC	Activity	% of GDP
A	Agriculture, forestry and fishing	2.49
C	Manufacturing	0.04
E	Water supply, sewerage, waste management ...	0.22
F	Construction	2.03
L	Real estate activities	2.89
T	Activities of households as employers	0.07
Total		7,74

The compilation of these figures is mainly based on two kinds of surveys:

- The Surveys on Employment and Informal Sector (SEIS) are a mix of household surveys and enterprise surveys. They have been carried out for 2005 and 2010. These surveys are based on samples of households from the latest Population and Housing Census, the sample size covering more than 8,000 households and stratified by regions. Besides of the households, around 5,000 non-agricultural informal units are covered, engaged in industry, trade, and services. From the primary activities, only forestry and logging were included. The informal units were defined as all production units with no taxpayer identification number and with no formal written accounts.
- Cameroon household budget surveys were carried out 1996, 2001, 2007 and 2014. They provide information for estimating the informal agricultural production, the agricultural production for households’ own use, the imputed rents for the owner-occupied dwellings, the domestic services, and the estimate of own-account construction of households.

(56) Weblink: [https://d3rp5jat0m3eyn.cloudfront.net/cms/assets/documents/Informal_Cross_Border_Trade_Survey_\(ICBT\)_2019.pdf](https://d3rp5jat0m3eyn.cloudfront.net/cms/assets/documents/Informal_Cross_Border_Trade_Survey_(ICBT)_2019.pdf)

(57) IMF, RWANDA: Measuring Informal Cross Border Trade Between Rwanda and Her Neighboring Countries, source: <https://www.imf.org/en/Data/Statistics/informal-economy-data/Reports/rwanda-measuring-informal-cross-border-trade>

(58) Press release COMESA, September 30, 2019. Weblink: <https://www.comesa.int/press-release-project-steering-team-for-regional-cross-border-programme-inaugurated/>

(59) Republic of Cameroon, National Institute of Statistics, Measuring the Non-Observed Economy in Cameroon: the importance of Supply and Use Table framework, April 2020

In its report, the National Institute of Statistics Cameroon outlines the main policy recommendations the collection of data for the non-observed economy are aiming at. Among others, it mentions the improvements of the National Accounts and the integration of the NOE into the country's National Strategy for the Development of Statistics (NSDS). Because of the relevance of employment in the informal sector, it also presents figures on jobs and on hours worked. The results underpin the labour intensity of the NOE which caters for 50 % of GDP but for 90 % of employment. Moreover, they quantify that even the formal sector has informal elements: 9,7 % of all employees 2016 in Cameroon worked in the formal sector. But out of them, 1,3 percentage points (13 %) did not have a formal labour contract, hence were informal (unregistered at the National Social Security Fund).

Informal jobs were defined as those of the non-agricultural informal sector units and agricultural jobs regardless of their employment status (principal or secondary employment). Also included are informal jobs in households producing mainly for their final consumption (cleaning, cooking, security services etc.). The survey asked for the number of employees as well as for the numbers of hours worked.

In its report, the National Institute of Statistics Cameroon underpins the importance of using SUT and product balances to compile the complete picture of the economy, with detailed information on supply and use of each product on the one hand and the production process (figures by economic activity) on the other hand.

7.4.2. Non-observed economy in Ethiopia

In contrast to Cameroon, Ethiopia does not explicitly show the informal sector in its National Accounts. Nevertheless, the compilers try their level best to be exhaustive in capturing all economic activity falling into the production boundary of GDP. This is partly enabled by a special survey carried out on the production of handicraft in the rural cottages by Ethiopia's Central Statistical Agency, and partly by estimates done by the compilers of the National Accounts which are a department of the National Planning and Development Commission and hence outside the CSA. The handicraft survey is carried out in irregular intervals. The last one was conducted in 2008 but is still in use (with estimates of the value added per worker and with extrapolations) for compiling cottage and handicraft manufacturing as a separate component of ISIC C. As in other countries, Ethiopia uses a country-specific classification of such manufacturing components, mainly oriented at practical criteria of surveyability:

- Large & medium scale manufacturing. (usage of electricity and 10 or more employees)
- Small scale manufacturing (usage of electricity and less than 10 employees)
- Cottage/handicrafts industries (no power-driven machinery but any number of workers).

Each of the three groups is classified by ISIC 4 sub-groups of manufacturing.

7.4.3. Capturing informal cross-border trade in Uganda

In Uganda, special efforts have been made to capture the informal part of cross-border trade. These have been well noted in the experts' community. UNSD has selected Uganda's Informal Cross-Border Trade Surveys as an example for country experience in its Compilers Manual on IMTS.⁶⁰ The text in the Compilers Manual can be summarized as follows:

- Uganda started the Informal Cross border Trade Survey (ICBT) as a means of bridging the gap identified in the external trade statistics. A baseline survey conducted in 2003 revealed that informal cross border trade was a significant component of merchandise trade between Uganda and her neighbouring countries. Therefore, its exclusion was a substantial underestimation of the overall merchandise trade statistics in the Balance of Payments and National Accounts.
- The full scale ICBT survey was launched in 2007 and has since been conducted consistently over the years. The main objective of the survey was to reduce the data gaps identified in both the BOP and the National Accounts. More specifically, the survey was intended to establish the main commodities traded informally, determine the value and volumes traded, and ascertain the direction of trade.
- Presently, the survey covers a total of 20 border posts distributed across the country. Prior to selecting the borders to monitor, on-spot visits to the potential borders are done. These visits are intended to gather useful information required for the border selection process. In this case, choice of the border posts was guided by a number of factors including, the volume of trade captured by the Customs Department; security; transport and communication links; and availability of supporting institutions like Uganda Revenue Authority, Uganda Police, other security agencies and Immigration offices.
- In addition to the 20 border points, enumerators are also stationed at 4 bus terminals which form the departure/ arrival points for buses destined to/arriving from the neighboring countries.

- The survey collects information on transactions that are not included in the official trade statistics of the country. These may include all goods entering or leaving the country at the border posts but are not captured by the customs authorities irrespective of the value; goods not declared or partially declared on customs documents; and goods loaded or offloaded at bus terminals destined to or originating from foreign countries. The survey does not capture information on smuggled goods, transit goods as well as goods crossing the border points beyond working hours.

- Data collection is done over a period of two consecutive weeks in a given month, and estimates are updated to cover the entire month. During monitoring at the borders, enumerators observe and record all merchandise entering and leaving the country, between 7:00am and 6:00pm. The number of enumerators deployed at a particular border post ranges between two and six, depending on the volume of trade.

- The main method of data collection is direct observation with occasional interaction with the traders whenever clarification about the goods they are carrying is needed. Local units of measure for quantities have been established for the main items traded, although enumerators, at times, weigh the items to ascertain the actual quantities.

- Prior to deployment, all enumerators must undergo training to equip them with the knowledge and skills needed to collect the requisite data.

- Compilation of ICBT data is in line with international best practice. Exports are valued on a free on board basis, while imports are valued at cost insurance and freight (cif). Prices of the traded goods are collected from around the border on a daily basis.

- Since data is collected for only two weeks in a month, an uprating model is used to derive estimates for the weeks not monitored. Similarly, missing data, arising out of failure to conduct the survey in a given period due to logistical and other challenges is estimated using standard linear interpolation and extrapolation models.

- Data in ICBT is disseminated by the central bank of Uganda⁶¹ and by Uganda Bureau of Statistics in an annual report on Informal Cross Border Trade and as part of the reports on merchandise trade statistics.

The Uganda experience has also been published in a paper of the IMF⁶², identical with the text in UNSD's Compiler Manual.

7.4.4. Capturing informal cross-border trade in Rwanda

For Rwanda, the IMF has published a "informal economy report", also.⁶³ It describes the activities undertaken for measuring the Informal Cross Border Trade (ICBT) in special surveys:

- Rwanda initiated an ICBT survey in 2009 to supplement statistics collected by the Customs Authorities and reduce the statistics gap. The ICBT Survey started on a pilot basis, covering a few crossing points along Rwandan borders and uprating for other identified borders for one year. After that year, the government decided to carry the survey on a monthly basis since January 2012 up today.

- The survey comprehensively includes the shuttle trade together with other informal trade. There is no specific survey targeting shuttle trade alone.

- To Rwanda, Informal Cross Border Trade generally refers to imports and exports of legitimately produced goods and services (i.e. legal goods and services), which directly or indirectly escape from the regulatory framework set by the government, and avoid taxes and regulatory measures, hence go unrecorded into official national statistics.

- The survey is carried out by the National Bank of Rwanda in partnership with other government institutions such as the National Institute of Statistics of Rwanda, the Rwanda Revenue Authority, and ministries concerned. To collect ICBT data, enumerators ask trade information to the traders that cross the borders between Rwanda and her neighboring country. This is done tactfully to avoid bringing non-tariff barriers on traders.

- The survey covers 17 official borders (borders with migration officers) and 39 major crossing points (borders with no presence of migration officers) around the country. The borders have between 2 to 6 enumerators/field staff per border post depending of the size of ICBT and work every day of the week.

- The informal trade data are grossed up with formal trade data in the compilation of trade balance component of the Balance of Payments (BOP), International Merchandise Trade Statistics (IMTS) and National accounts, generally for external sector analysis.

- Since the adoption of the survey on ICBT, the Rwanda trade statistics have improved. On average, informal exports contribute about 12% of total exports whereas imports contribute around 3% of total imports.

(60) UNSD, *online Compilers Manual, Chapter 4*. Weblink: <https://unstats.un.org/wiki/pages/viewpage.action?pageId=6324565>

(61) Weblink: <https://www.bou.or.ug/bou/bouwebsite/bouwebsitecontent/statistics/Surveys/TradeStatistics/ICBT/ANNUAL-INFORMAL-CROSS-BORDER-TRADE-SURVEY-REPORT-2018.pdf>

(62) Weblink: <https://www.imf.org/en/Data/Statistics/informal-economy-data/Reports/uganda-the-informal-cross-border-trade-survey>

(63) IMF, *Informal Economy Reports, RWANDA: Measuring Informal Cross Border Trade Between Rwanda and Her Neighboring Countries*. Weblink: <https://www.imf.org/en/Data/Statistics/informal-economy-data/Reports/rwanda-measuring-informal-cross-border-trade>

8.

Volume estimates

8.1. Volume estimates with a fixed base year

In the SNA, the term “volume” has replaced “constant prices”. But the term “volume” is still not very popular among the compilers of National Accounts and their users although it was deeply embedded in the previous SNA (1993), already. It has been introduced to extend the simple definition of value of production as “quantity multiplied by prices” by value as “volume multiplied by prices”. “Volume” is the joint result of quantities plus changes in quality.⁶⁴ To include the quality aspect has become necessary in the industrialized countries where the value of manufactured items like computers, cars or aircraft heavily depends on the quality.

For many African economies, the domestic output is still widely confined to homogeneous goods from agriculture, mining or from the production of construction materials, fertilizers and the like. In this context, volume and quantities often can be used as synonyms. Hence, the quality aspects may still do not play an important role as far as domestic production is concerned. Nevertheless, it has been deemed necessary to introduce the term “volume” here and to use it in future publications to follow the modern terminology.

For decades of years, “constant prices” stood for the results of time-series where the prices for all its years have been kept constant by multiplying the quantities / volumes of year t with the prices of a certain base year. In many countries, the technique of applying a fixed base year (often the same one chosen for the rebasing) has now been given up in favour of the technique of “chaining” which, in principle, means to change the price base every year in a way that every change of volumes is calculated at the price level of the previous year.⁶⁵ But so far, most countries in Africa, unless they are ERETES users (see section 2.8), have decided to abide by using a fixed base year and to continue speaking of “constant prices”.⁶⁶ The ERETES software implies the chain-linking approach.

For users which are not so versatile with the terminology of National Accounts, the terms “constant prices” as well as “in real terms” (often used for figures at constant prices) may be irritating as prices, of course, are not constant. Speaking of “constant prices” expresses the underlying (fictitious) assumption. Similarly, “real terms” describes a fiction rather than reality. It is even vice versa: the reality is better reflected by the current prices. Nevertheless, the dubious terms have been used here because they are deeply embedded in the internationally common terminology.

(64) For more explanation see SNA 2008, par. 15.98 ff.

(65) For more explanation see section 8.4 or SNA 2008, par. 15.36 ff.

(66) SNA 15.98: “When time series are constructed by dividing the current values for each year at the most detailed level possible by fixed base year Laspeyres price indices, it is appropriate to describe the resulting series as being at the constant prices of the base year.”

The idea of calculating constant prices is simple. The purpose is to arrive at macro-economic aggregates of subsequent years where the effect of pure inflation is extinct so that “growth rates” can be delineated. According to the SNA (par. 15.180), “it is best to derive volume estimates by deflating the current values with an appropriate price index, rather than constructing the volume estimates directly. It is therefore very important to have valid indices available.” It should, however, be noted that “constructing the volume estimates directly” is still a common technique in Africa, presupposed that it is applied to the homogeneous goods of agriculture, mining and partly manufacturing. This is because price indices other than the CPI and its components often are lacking.

Utilizing price indices for volume estimates is straightforward. The CPI or the PPIs⁶⁷ are used to...

- either deflate figures which are compiled in value terms at current prices
- or inflate figures which are collected as quantities and are then multiplied with prices measured in the base year. This is the reciprocal procedure to deflation as described above. It results in calculating monetary values for items for which the available statistics are only given in terms of quantities (e.g. production of crops or livestock or animal products).

For this purpose, sub-indices of the CPI (or the PPIs, respectively), or even indices for single items wherever available, are used to customize the chosen inflator or deflator, to the greatest extent possible for the measured item.

For calculating GDP from the production side, the SNA sees the “double deflation” method as the preferred one, which deflates the current value of output and the current value of intermediate consumption separately, with deflated GVA as the balancing item between the two. But the SNA also tolerates the “single deflation” where GVA is deflated with the index representing the price changes of the output. SNA 15.136: “The choice to be made between the use of a single indicator method (which may yield biased results) or a double deflation method (which may yield volatile results) must be based on judgement. The same choice need not be made for all industry groups. Further, the single indicator method may be used for quarterly figures until the year is complete and better double deflation estimates are available.”

For benchmarking price changes in imports and exports, many countries use unit value indices. Annex 12.4 outlines this further.

(67) Producer Price Indices (PPIs) are mentioned in plural as there may be several, e.g. for mining, for manufacturing, for construction or any other kind of activity, possibly even for services. In contrast to the consumer prices (CPI), there is no combined, general index for all kinds of producer prices.

(68) If it is only for the purpose of deflation in National Accounts, it can be a very simple one. Example: take 20 model employees, specified by different ages, sexes, grades, functions and ministries and observe over the years what their monthly salary would be (averages of 12 months). Give it a weighting scheme (possibly estimated by statistics of government employees) and calculate the annual wage rate index from the weighted totals of these 20 persons.

8.2. Non-market output as a special case

With the SNA 2008, general government’s final consumption expenditures have now to be split into “collective consumption” and “individual consumption”. The individual consumption is consumption of government services which can be attributed to identifiable persons, e.g. services of education, health or social affairs. This part should in ideal case (recommendation of SNA 2008, par. 15.118 ff) be deflated by volumes (SNA: “output volume method”) which could be measured as an output of these services, e.g. number of successfully passed university exams etc. If this is not possible, the SNA recommends using the “input method” which is “generally best derived by deflating the various input costs by corresponding constant-quality price indices, or when such price indices are unavailable, using volume indicators that reflect input volume change (for example, number of hours worked by employees)” (SNA 15.119). In most African countries, the latter option (input method) might be chosen as it is easier to materialize:

- The IC of the government activities is deflated like the IC of any other industry by the mechanism of distributing price changes of outputs and imports over the respective use categories.

• The value added of the government (mainly compensation of employees) is deflated simply by the average of wages and salaries per employees (as a proxy for the number of hours worked). The technical tool for this may be a wage rate index calculated for this purpose.⁶⁸

- Like in the current prices format, the figure of final consumption expenditures of general government at constant prices is the total of both components (IC and GVA).

The deflation approach by using a wage rate index for the government employees uses the simple average of total wages and salaries paid by the government per government employee. It can be calculated in two variants: (i) based on the assumption that the service output per employee in volume terms does not change over time, (ii) the service output per employee in volume terms increases every year continuously by a certain percentage (say: 0.5 %) due to improvements in the capital stock of the government units (computers, servers, other IT and communication facilities etc).

8.3. Using SUT for volume estimates

Ideally, deriving volume measures “should be done within the context of supply and use tables” (SNA 15.95).⁶⁹ The advantage is that, because of the tautological construction of the SUT, the identity of supply and uses will also hold at constant prices.⁷⁰ The ERETES software (see section 2.8) is practicing this for deriving volume measures.

The rationale of the SUT approach is as follows:

- Price changes may occur at the different steps of the provision of goods and services to their users. For imports, this is the entry of the goods into the country (cif value) and their increments through taxation (if any), duties, trade (if any) and separately invoiced transport (if any). For domestic output, this is the price at the farm or the factory gate plus taxation (if any), trade (if any) and separately invoiced transport (if any).
- But price information is limited. It often needs estimates and makeshifts. Regular direct price observation is made at the consumer level for the items selected for the CPI. But for the domestic output, the SNA recommends utilization of producer price indices (PPIs) which in many countries are lacking at all.
- Often, estimates must be made as a makeshift, applying CPI-related information or price information from secondary sources or simply by guess.
- For the imports, often there are no direct price observations either but for many imported goods the merchandize trade statistics provides not only the cif values but also the quantities. At least for homogeneous goods, this allows for calculating average prices (so-called unit values) at the point of entering the country and prior to levying import duties on them. This option is outlined in annex 12.4.
- For the exports, special price indices are also not available in most African countries.
- In practical terms, the SUT for the constant price values is the SUT at current prices, however calculating the supply by multiplying output and intermediate consumption with the reciprocal of the price indices for the year under calculation. The structures of the SUT at current and at constant prices remain fully identical.

• The distribution pattern of the use categories will remain the same. As a result, the price changes of the outputs and of the imports will have their appropriate impact on the values of the intermediate and final uses they are contributing to. In other words: the SUT is the weighting scheme for implicitly calculating the constant prices for the intermediate consumption, for final consumption expenditures of households, government and NPISH, for the capital formation and for the exports.

If compiled properly, both versions, current as well as constant prices, will be reconciled and balanced between GDP from the production side and GDP from the expenditure side. Nevertheless, it will be necessary to check the results by benchmarking with at least the price information which is available. There are two options:

- First, the result for the constant price figure of households' consumption expenditures should roughly comply with the figure resulting from deflating the current price figure with the CPI at large. Minor discrepancies can be tolerated as the CPI does not capture all kinds of items. Health expenditures, for example, are often missing.
- Second, the result for the constant price figure of the imports and the exports should roughly comply with the figure resulting from deflating the current price imports, and exports respectively, with the unit value index of the imports and exports. Discrepancies may give rise to investigate the quality of either the unit value figures or the prices applied to the output of the export or import items.
- The compilation and balancing of the constant prices SUT lead to simultaneously adjusting the current price SUT which then will be balanced again. Corrections of the SUT at constant prices can only be done by correcting the current price values or by choosing other indices for deflation, not by correcting the constant price figures directly.
- Emphasis should be given to activities where value added is small compared to output and IC. Small errors in deflation may then lead to negative value added which in current prices is positive. Such a constellation is economically possible but needs valid explanation.

8.4. Chaining

Since its first version, the SNA has also been the most important conceptual paper for producing price statistics. But the price statisticians in the statistical offices may not even be aware that their work is primarily determined by the needs of National Accounts. Chapter 15 of the SNA 2008 intensively deals with index number theory and other theoretical aspects of measuring price changes before giving recommendations about their practical application. After some years of intensive and controversial discussions within the National Accounts community, the SNA now opts for using chaining for deflation. SNA 2008, 15.97: “... chaining should be introduced for data derived by deflation of individual components. ... this should ideally be done annually using price indices of the previous year but if this is not possible, chaining over a longer period should be adopted. Major changes in economic structure,

such as the impact of rapid fluctuations in oil prices on an oil exporting economy indicate that using the same base year before and after the change is likely to give quite misleading indications of the evolution of the economy. Chaining becomes essential rather than just desirable in such cases.” Moreover, it is well known that volume series at “constant prices” can be misleading when the base year is very old. Even in the system of fixed base years, the base year should be changed after some years.

Practically, the chaining is done in three steps:

- Calculate the aggregate in previous year's prices.
- Calculate the growth rate over the previous year.
- Calculate a chain index for a reference year (=100) by multiplying this figure with the growth rate and do it for the subsequent years also.

A simplified example with the GDP for 2014 to 2018 and with CPI as the only deflator may illustrate these steps.

	2014	2015	2016	2017	2018
The data					
GDP nominal	50	56	60	63	70
Growth rate nominal in %		12,00	7,14	5,00	11,11
CPI	95	100	103	105	110
CPI Index 2014 = 100	100	105,26	108,42	110,53	115,79
GDP "constant prices" (=2014)	50,00	53,20	55,34	57,00	60,45
Index "constant prices" (2014=100)	100,00	106,40	110,68	114,00	120,91
Annual growth rate at „constant prices“ in %		6,40	4,02	3,00	6,06
The steps of chaining					
<i>First step of chaining: calculate GDP in previous year's prices</i>					
GDP previous year's prices	50	53,20	58,25	61,80	66,82
<i>Second step of chaining: calculate growth rate over previous year with price base previous year</i>					
Growth rates on previous year's prices in %		6,40	4,02	3,00	6,06
<i>3rd step: chaining by multiplying ref. Year (=100) with growth rate of subsequent year (s)</i>					
Volume chain index (2014=100)	100	106,40	110,68	114,00	120,91
Annual growth rate as per volume chain index in %		6,40	4,02	3,00	6,06
Annual growth rate at „constant prices“ in %		6,40	4,02	3,00	6,06

The example shows that the growth rates results for “constant prices” and for “chaining” are totally the same when only one single deflator is employed. Using chain indices presupposes a diversity of regular price information. Chaining will not bring any improvement when solely the CPI is used for each volume estimate. Thus, for a lot of African countries chaining is presently out of reach. Most of them prefer volume estimates with a fixed base year.

The statistical offices following the advice of the SNA are usually publishing the index as such and not the time-series of absolute figures in local or international currency pertaining to these indices.⁷¹ There are two reasons: one is that chain indices are lacking additivity which means that the sum of the sub-totals (slightly) mismatches the totals; and the other one is that each year of the time-series would have another price basis (see also SNA 15.99).

In Africa, the ERTES countries (see section 2.8) and Mauritius are using the chaining method.

(69) A description of the methodology proper (at conditions of an industrialized country) is given by Liv Hobbelstad Simpson, *National Accounts Supply and Use Tables (SUT) in Constant Prices*, edited by Statistics Norway, June 2005, web source https://www.ssb.no/a/english/publikasjoner/pdf/doc_200504_en/doc_200504_en.pdf

(70) SNA 14.154: “Given the existence of PPIs for the rows of the use table, these can be applied to the rows of the supply table also and the column sums then give a figure for output in volume terms. Deducting the figures for intermediate consumption in volume terms derived from the deflation exercise for the product rows in the use table permits the calculation of value added for each type of producing unit as a residual. It is this residual that is described as being “in real terms”. It is also possible to derive an implied deflator for value added by dividing the current value by the value in real terms.”

(71) Mauritius, for example, is publishing its value added and its GDP at current prices while volume-related figures are given only in growth rates. See http://statsmauritius.govmu.org/English/StatsbySubj/Documents/Digest/National%20Accounts/Digest_NA_Yr18.pdf.

9.

Special technical topics GDP production

9.1. Introductory remarks to this chapter

For most countries, the core of National Accounts compilation – or at least its starting point - is dedicated to measuring GDP from the production side by the different economic activities foreseen in the ISIC. The SNA is very exhaustive in outlining the conceptual frame for it, be it the definition of output or intermediate consumption or the definition of the units carrying out production. But it is not very outspoken in describing the compilation for each position of the ISIC. It instead provides a sub-chapter F to its chapter 6 (“The production account”) where on not more than 10 of its 655 pages, it explains “the output of particular industries”, covering ...

- Agriculture, forestry and fishing
- Machinery, equipment and construction
- Transportation and storage
- Wholesale and retail distribution
- Output of the central bank
- Financial services other than those associated with insurance and pension funds
- Financial services associated with insurance and pension schemes
- Research and development
- The production of originals and copies

This chapter does not intend to paraphrase the SNA sub-chapter on the “particular industries”. It instead addresses some additional aspects which are relevant from the perspective of the African countries. Like the SNA, it is selective and in ascending order of the ISIC, but also not trying to be exhaustive for all ISIC positions.

9.2. Agriculture, forestry and fishing

In many countries, not only in Africa, the recording of output and value added of agriculture is structured by products rather than by ISIC classes. This is because the data sources, be it primary censuses or surveys or be it administrative data from crop harvest records or from livestock estimates, are specified along the kinds of crops or animals rather than along the kinds of activity producing them. Therefore, the output of agriculture is often confined to the primary activity, leaving aside secondary activities which farmers may also carry out, e.g. transport services, construction of own-account capital formation or renting out their own machinery to others. In other words, agriculture is often measured by its core function, only, even omitting a classification to the ISIC which goes beyond the two-digit level. In compiling agriculture, the “establishment” as such – the SNA’s core unit for measurement of production by economic activity - is usually not perceived as the underlying concept of measurement. Consequently, it is often not before the compilation of Supply and Use Tables (SUT), that the secondary products of the farms get attention. At least for the construction activity of farms (own-account production of water wells, fences, barns and the like), some countries overcome this under-coverage by enhancing the output of the construction industry by a certain mark-up.

Especially for crops, the common data sources may suggest a gross recording of output which is not foreseen in the SNA. The harvest estimates include some components which are deliveries internal to the farm (establishment) and not to be recorded as output.⁷² Examples are the crops used for the fodder of the animals.⁷³ Some countries are reluctant to reduce the figures for the output of such crops accordingly, because they want the output figures to match the official harvest values given by their ministries of agriculture. If they enhance the input-output ratio for the respective crops accordingly, the GVA would not be affected by this (minor) deviation from the SNA rules.

Agricultural statistics usually cover what is produced within cultivated areas and farms, be it crops or livestock. In some countries, the harvesting of wild berries, nuts or mushrooms or other kinds of non-wood forest products growing in the open is relevant and must not be forgotten,

ditto the nomadic production. A special case is logging (ISIC 0220) which in Africa is mainly production of roundwood for forest-based manufacturing or the gathering and production of charcoal and firewood. In most countries, the output of charcoal and firewood is estimated using figures from statistics on household consumption.

About coverage, there are support activities to agriculture which may not be included in the common data sources for recording the output of agriculture. Such activities are subsumed in ISIC 016 (“Support activities to agriculture and post-harvest crop activities”) and comprise, for example, field preparations, crop spraying or operation of irrigation equipment. Also included would be the provision of machinery, e.g. harvesting machines, with operators and crew.⁷⁴ As such activities are not easy to identify, there is the risk of underreporting. It can even be that such services are identified and recorded as intermediate consumption of the farms but are lacking in the recording of the output. This was discovered, for example, in Ethiopia and has been addressed as one of the deficiencies to be amended during the next revision.

9.3. Mining

In some countries, uncertainties have been felt about two aspects of mining: one is the treatment of mineral exploration and the other is the recording of royalties paid by the companies to the owners of the land, in most cases the general government.

About mineral exploration, the SNA clearly states that “expenditures on mineral exploration and evaluation are not treated as intermediate consumption. Whether successful or not, they are needed to acquire new reserves and so are all classified as gross fixed capital formation” (SNA 6.231). Hence, the exploration as such must also be output, be it by the company itself (output for own capital formation) or by specialized companies hired for that purpose. “The expenditures incurred on exploration within a given accounting period, whether undertaken on own account or not, are ... treated as expenditures on the acquisition of an intellectual property product and included in the enterprise’s gross fixed capital formation” (SNA 10.107).

(72) For the problem of recording deliveries internal to the establishment, see also the recording of electricity by diesel generators in section 9.5.

(73) For the seeds of cereals for future crops, it may be argued in the same way. But there is a time span until they are used in the next vegetation period. If there is proper recording of ingoing and outgoing of the inventories (which in practice is rarely the case), then it would be justified to record the output of cereals including the seeds for the next season (see also SNA 6.123).

(74) The renting out of machinery without operator, e.g. sewing machines or tractors, would fall under ISIC 7730 “Renting and leasing of other machinery, equipment and tangible goods n.e.c.”

About royalties on land, it might be unclear whether such payments are to be subsumed under intermediate consumption or government fees falling under current transfers. By definition of the SNA (7.160), the royalties are treated as “rents on subsoil assets” and classified as property income, hence, to be paid out of the operating surplus of the mining companies. Consequently, the expenditures on royalties must not be recorded as intermediate consumption.

Some African countries like Angola, Democratic Republic of Congo, Namibia, Botswana or South Sudan have a large mining economy, often with companies fully or partly owned by foreigners. In case of South Sudan, the problem with sharing the pipeline is described below (section 9.9). For GDP calculation, it must be guaranteed that all mining activities on or below the soil of the country are included. Even in case of unincorporated activities of foreign owners, such activities would fall under resident corporations, here quasi-corporation according to SNA 4.42 b.

In recording of mineral activities, the National Accounts often have the records of the respective mining authorities as the only data source. In such cases, it must not be forgotten to add the surface minerals such as sand or limestone which often are outside the administrative records.

9.4. Manufacturing

As far as the formal economy is concerned, the recording of manufacturing activities in African countries does not impose problems which are specific for the continent. But for the small-scale manufacturing, the statistical observation is more difficult than in Europe or in the Americas, just because of the enormous share of the small and often informal manufacturers. For the sake of being comprehensive, some countries even give special attention to capturing small handicraft production carried out by families in their homes, albeit in very low periodicity (see section 7.4.2). All goods produced by households, regardless whether for own consumption or for sale, are included in the production boundary of the SNA, constitute GDP and their production and their consumption should, of course, be measured when significant. In its paragraph 6.32d, the SNA gives examples for such production: “weaving cloth; dress making and tailoring; the production of footwear; the production of pottery, utensils or durables; making furniture or furnishings; etc.”

Tanzania may hold as another example. The National

Bureau of Statistics conducts an “Annual Survey of Industrial Production”. But as manufacture of wearing apparel and of furniture are largely informal, complementary estimates are developed from the expenditure side (Household Budget Surveys).

In most Francophone countries, the use of “Déclaration statistique et fiscale” or “Fiscal and statistic statement” are an important source for collecting data on manufacturing.

9.5. Gas, water, sewerage, waste disposal and energy

In Africa, especially in its rural areas, the provision of gas, water and energy is often in the hands of the users themselves. The supply of gas is widely confined to gas in the form of liquefied petroleum gas (LPG) or butane gas in bottles. The production of such bottles would fall under ISIC 1920 (Manufacture of refined petroleum products) and must not be captured under ISIC D (Electricity, gas, steam and air conditioning supply). In many African countries, the provision of gas through an infrastructural system of mains (ISIC 3520 Manufacture of gas; distribution of gaseous fuels through mains) is rare or even totally absent.

Similarly, many households or producers do not have access to water through a system of pipes. If not forced to use public taps, they may have own water wells or artificial water reservoirs (cisterns or tanks), from time to time filled by water trucks or other kinds of mobile water transport. The distribution of water by trucks, regardless whether by units of the local government or by private supplier, would fall under ISIC 3600 (Water collection, treatment and supply) and not under transport services.

In case of public supply without charging significant prices (hence classified and recorded as non-market output), countries may have problems to identify such expenditures by their specific kind of activity and may still tend to subsume it all under ISIC O (public administration), as it was the case in the SNA 1968. The same may hold for public non-market output of sewerage services (ISIC 37) or of waste collection (ISIC 38). But the SNA 1993 as well as the SNA 2008 recommend to allocate all non-market output to the respective ISIC position, in ideal case on the basis of the Classification of the Functions of the Government (COFOG) as it is meanwhile implemented by the Government

Finance Statistics in most African countries. For more details see also section 4.3. The COFOG classification may be used for a bridge table, customized for the respective country, where each COFOG code is allocated to the ISIC position in quest. In its rough structure, the COFOG is attached below in annex 12.7.

It is straightforward that each country would capture the water supply through mains or through trucks in its GDP. But it may be considered less straightforward whether supply of water through own water wells must be included in GDP or not. However, the SNA is very clear on that. It includes the production of all goods (not necessarily of services) within the production boundary. It enumerates the types of household production which are included in GDP, whether intended for own final consumption or not. “The supply of water is also considered a goods-producing activity in this context” (SNA 6.32 e).

The SNA’s rule on inclusion of goods produced by households for own consumption⁷⁵ may also hold for the decision whether to capture the production of solar energy if done by single households for themselves. In the list of typical goods, solar energy is not explicitly mentioned. But SNA 6.33 states: “It is not feasible to draw up a complete, exhaustive list of all possible productive activities When the amount of a good produced within households is believed to be quantitatively important in relation to the total supply of that good in a country, its production should be recorded.” Hence, the SNA leaves it to the countries whether to include individual production of solar energy or not. But it recommends inclusion when the production is relevant (which in most African countries might be the case).

Another special case of energy production in Africa is the electricity produced by shop keepers, restaurants, government units and other kinds of producers during times when the public electricity grid does not supply. “Load shedding” is common in many African countries, and so is the compensatory, individual generation of electricity, mostly through diesel generators. However, if produced by shopkeepers or restaurants, this production is purely for internal use within the same establishment and is not to be captured as output (see also SNA 6.89b). Analogously to the commercial bookkeeping, the consumption of fuels is to be recorded as intermediate consumption of the shop keepers and the restaurants.

(75) See also SNA 3.87: “For households, the principle in the SNA is that all goods produced by persons that are subsequently used by the same persons, or members of the same households, for purposes of final consumption are to be included in output in a manner analogous to that for goods sold on the market. This means that transactions are assumed in which the persons responsible for the production of the goods are deemed to deliver the goods to themselves as consumers, or members of their own households, and then values have to be associated with them in order to enter them in the accounts.”

9.6. Construction

9.6.1. Specialties of construction output

There are several specialties which are unique to construction work and which must be considered when calculating the respective output and its uses. Some relate to the time dimension, some to the regional dimension and some to its scope:

- The production of buildings or of structures like motorways, dams, railroad tracks or pipelines is time consuming. Hence, perennial production is common and covers subsequent years. According to SNA 6.140, output of unfinished buildings is to be treated as sold rather than as work-in-progress, unless the contractor is building without not yet having found a purchaser for it.

- Especially in Africa, production through foreign companies is common. For most construction sites, the “one-year rule” is to be applied: Large-scale construction of a year or more to complete will usually give rise to a resident branch of the foreign construction company with a direct investment relationship between parent and branch. This means that, for example, a Chinese construction company erecting a building in Dar es Salaam, is considered to have a branch (quasi-corporation) in Tanzania. This branch may distribute its operating surplus to China, but its output contributes to the GDP of Tanzania where the construction site is located. This rule is necessary to ensure that the building or structure enters the capital stock of the country of its location, simply because buildings cannot be exported or imported and hence must be correctly allocated to the proper region during their creation, already.

- Construction of domestic companies in foreign countries may be less common but must be considered also, of course, and then is to be treated in opposite direction, analogously.

- Which part of construction work constitutes exports or imports and how to treat deliveries of materials between the foreign company and the branch, is outlined in BOP (BOP 6, 10.103 ff) in more detail than in the SNA. The share of construction output in GDP can be delineated from there.

- In the BOP, construction work of contractors which do not fall under the one-year-rule is recorded as import, or export, respectively, of a service. Construction work is covered under the 12 standard components of services and is recorded gross: Construction of foreign contractors in the domestic economy as imports and construction work done abroad (below the one-year rule) minus purchases of materials in the domestic economy as exports. The construction work of domestic contractors abroad on larger scale (fulfilling the one-year rule) remain outside the GDP of the domestic economy.

- In the construction industry, subcontracting is common. In terms of commercial bookkeeping as well as in NA, the sub-contractors are delivering output to the main contractor for whom this is cost (commercial bookkeeping) or intermediate consumption (NA), respectively. This implies the risk of double counting. In construction surveys, the questions on the IC part should cover subcontracting carefully.

- For large construction projects, government departments like Highway construction authorities or Ministries of Public Work etc. may be common. They may be involved in planning, designing and managing construction work: they produce own capital formation but do not contribute to construction as per ISIC F. They would fall under ISIC 71 (Architecture and engineering activities), but their output should be subsumed under the gross fixed capital formation accruing from the construction work.

- Local governments may also carry out construction work for own final capital formation, e.g. in communal construction departments for street repair or maintenance of public buildings.

- Construction as a secondary activity of other industries than construction is common, e.g. in the form of producing own gross fixed capital formation. This may significantly be the case for agriculture where farmers often construct barns, fences, water wells or irrigation systems by their own hands or with local labourers especially hired for this purpose. Official statistics with agriculture often omit asking for such secondary activities.⁷⁶

- Informal construction activity of households for occupation by themselves as own capital formation is also common. In the SNA, the do-it-yourself construction of owner-occupied dwellings would fall under secondary construction activity of the real estate industry (ISIC 6810) where the services of owner-occupied dwellings would belong to. Own gross fixed capital formation of owner-occupiers is GFCF of the institutional sector households.

Small maintenance work (\neq GFCF) for dwellings done by the owner-occupiers themselves would also be secondary output of construction. But it would be intermediate consumption of real estate industry (materials only) rather than GFCF. But it goes without saying that compiling such activities requires a lot of estimation, often referring to extrapolations from Population and Housing Censuses.

In ideal case, the collection of data is supported through surveys with at least the bigger construction companies ("contractors") being covered. For the reasons mentioned above, it would be necessary to get the data in regional allocation according to the construction site. This is especially true for countries which also provide Regional Accounts.

Moreover, it would be useful to ask for a sub-classification of the output by client groups, e.g. private or public work. The contractors' revenues from public construction could then be benchmarked with the respective figures given for this purpose in the Government Finance Statistics (GFS).

In many African countries, however, such contractor surveys are lacking at all or are not carried out regularly. Sometimes, they are integral part of an economic census. If at least the data from one year under observation is available then extrapolation may be a way out, using input indices of construction materials (domestic production plus imports minus exports). Such kind of commodity flow methods to measure construction output may also (alternatively or as an addition for benchmarking) aim at aggregating the three major demand components:

- Exploiting financial statements of companies or enterprise surveys where GFCF is among the variables of interrogation, possibly sub-classified in a way that at least the capital formation in buildings can be depicted.

- Using GFS for adding the expenditures of general government on current and on capital expenditures on construction work.

- Estimating the households' informal construction of houses for their own final capital formation, possibly exploiting household income and expenditure surveys or household budget surveys.

Capital formation aggregated this way can roughly be considered as output of construction, notwithstanding the fact that (i) payments for the work done and the work itself may fall in different periods and that (ii) small fractions of it may be created by non-contractors like architects and lawyers, the latter ones organizing the administrative part of ownership transfer.

9.6.2. Implementing the SNA rules for African countries

For the African countries, there are four kinds of construction work which need special attention:

- In many countries, a lot of major construction work is carried out by foreign companies, often Chinese ones. It needs capturing these activities for the two reasons mentioned above: being comprehensive in capturing (i) domestic activities and GDP and (ii) capital formation accruing from construction work.

- In Africa, several infrastructural buildings span over more than one country. These are railway tracks, motorways or pipelines. The allocation of the transport services of the provision of pipelines, with some hints about the allocation of the construction work and of the assets themselves, is tackled in section 9.8.

- There are infrastructural projects like the Grand Ethiopian Renaissance Dam at the Blue Nile in Ethiopia which have an outstanding impact on the level and structure of the GDP and, hence, need extremely careful attention of the compilers.

- On the other side, there are small-scale activities, often below the radar of official contractor surveys, which in Africa are similarly relevant just because of their sheer quantity. These are, most of all, the own-account construction work of farmers or other small-scale producers and the do-it-yourself construction work of households, including the construction of owner-occupied dwellings which in Africa's rural areas are common (see also section 9.12). The secondary output of farms is often disregarded when measuring the output of agriculture is mainly based on official harvest estimates and official livestock figures.

9.7. Trade

The full title of section G of the ISIC is "Wholesale and retail trade; repair of motor vehicles and motorcycles". In very old versions of the ISIC (ISIC 2 from 1968), the repair of motor vehicles and motorcycles had not been subsumed under the "trade" section. But it was felt that many vendors of cars or motorcycles were also offering the sales of spare parts and the repair of the vehicles, often with a blurred picture of whether the sales or whether the repair are the major activity. Therefore, since ISIC version 3, the sales as well as the repairs of cars, trucks, busses or motorcycles are jointly captured in the same ISIC section. In Africa, small shops for repair of motor vehicles are still common. Their activities must be measured separately when surveys on trade activity are conducted and are confined to the shopkeepers usually associated with "trade".

Trade is one of the three "margin" industries where the output is not mainly measured by the revenues but by the difference (margin) between the revenues and some kinds of expenditures. The other margin industries are producers of financial intermediation services, of insurance services and of services of lotteries and gambling.⁷⁷ For short and changes in inventories neglected, the trade margin is the difference between revenues from sales and the expenditures for goods purchased for resale.

Of course, it is possible for most of the wholesalers and retailers to provide the necessary data for delineating their output, their intermediate consumption and the value added. But it is difficult and costly for most African statistical offices to carry out statistics on regular basis. In industrialized countries with a quite settled and stable population of stationary shops and outlets, such surveys can make use of cost-saving sampling techniques. In most African countries, the small and often informal, often fugitive trade establishments are huge in number and much more difficult to observe statistically. Trade surveys often are confined to shops above a certain threshold of employees or sales, and often carried out only once within several years. Data from tax authorities may not be a good substitute data base as taxation is often levied on lump-sum basis, if at all.⁷⁸ Moreover, trade surveys are often confined to urban areas, requiring techniques of estimating trade output in the rural areas.

(76) Similarly, the ILO Handbook on Informal Economy (ILO 2013) stresses: "Experience has shown that such non-agricultural activities are frequently undertaken as secondary activities of farm households or during the agricultural slack season, and therefore measurement of secondary activities is an important requirement."

(77) In some African countries, e.g. Uganda, services of lotteries and gambling are not a minor issue. For measuring them, the SNA (8.136) defines: "The amounts paid for lottery tickets or placed in bets consist of two elements: the payment of a service charge to the unit organizing the lottery or gambling and a residual current transfer that is paid out to the winners."
(78) In some countries, VAT systems are in place or are under implementation. Depending on the national taxation laws and on the laws and regulations for exploiting taxation data for statistical purposes, the situation for making use of such data for trade statistics may improve.

Given these impediments, countries are forced to develop sophisticated methods of compilation, combining results from multi-annual trade surveys (or economic censuses) with extrapolations and various assumptions. The case of Ethiopia may hold as an example. In its main steps, it is outlined below:

- For a certain benchmark year, Ethiopia has conducted a trade survey, however confined to the urban areas. It provides the values of output (trade margins), of inputs and of GVA of trade activities and the ratios for the trade margins, separately for the three ISIC Divisions of trade activities in ISIC G.⁷⁹
- The inclusion of the rural areas is done by using employment figures from the Labour Force Survey which provides the number of persons employed in trade activities separately for urban and for rural areas.
- The general approach is to multiply the number of employees with the average GVA per worker. For the urban areas and for its reference year, the trade survey gives the average GVA. For the rural areas, it is assumed that there is only retail trade, hence wholesale trade and sale of motor vehicles and motorcycles and repair and maintenance being confined to urban areas only. Moreover, it is assumed that the GVA per worker in the rural area for rural retail trade is lower than in the urban areas. The input-output ratio (ratio IC to margins) for rural retail trade has been estimated as 33%, which is half of the IC ratio of retail trade in urban areas.
- The current year estimates are obtained by moving the base year estimates according to the development of that share of output of commodity producing industries (agriculture, manufacturing) and of imports which are considered to be channelled through trade (marketable output or import, respectively). These shares are estimated, considering that many commodities are used by the producers themselves, e.g. self-consumption of farmers, or are purchased by customers directly, bypassing trade. The result is the estimate of goods purchased by trade for resale, both valued at current and at constant prices.
- The output of trade at current and at constant prices is then calculated as value of the marketable output, or import, respectively, multiplied with (estimated) ratios for the respective trade margins.
- But this estimate of trade output depends on many ratios and assumptions, leading to results which may fairly reflect the change over time but not the level of GVA in absolute terms. Hence, it is only used as a proxy for extrapolating the base year GVA.

For Supply and Use Tables (SUT), the calculation of the output of trade is very special as, besides of transport margins and the taxes (less subsidies) on products, it is one of the components of the transition from supply at basic prices to the intermediate and final uses at purchasers' prices. In the SUT, the total of the trade margin must be zero, simply because trade is not a service which can be purchased as such and must therefore be fully incorporated in the valuation of the goods which had passed through the trade channel (see also sections 2.6, 8.3 and annex 12.5 on SUT).

9.8. Transport services

Like the trade margins, the transport margins are one of the components of the transition from supply at basic prices to the intermediate and final uses at purchasers' prices. In the SUT, the transport margins for the whole economy must also add up to zero. Consequently, the compilation of the output of transport in a SUT is to be reconciled in an overarching context, as far as the transport of sold goods is concerned.

But transport does not belong to the margin industries mentioned in the previous section. As for most other industries, the output is mainly measured by the revenues from its services. And there are other transports than those of goods for trading purpose, e.g. transport of waste, of construction materials or of passengers.

In principle, capturing the output and the intermediate consumption of transport services for Africa does not impose difficulties which are specific to the continent (except the pipelines tackled in the following section). The only problem is that, especially for land transport via taxis and motorcycles in various forms, the number of small and informal producers is huge and statistical observation is difficult and costly. Some countries have developed estimation methods which are based on the number of registered vehicles multiplied with average amounts of output, intermediate consumption or directly the GVA per kind of vehicle. In the better variant, these averages are based on surveys, possibly small samples, in the poor variant the average figures per vehicle are simply estimates out of "local knowledge" or "expert knowledge". In both cases, the experience with such methods often shows overstatement just because the stock of publicly

registered vehicles lacks deregistration of obsolete vehicles and therefore grows beyond reality, counting additions to the stocks but underrating the outgoings.

Special attention should be given to the proper recording of international transport of goods. For the relevance of such transports see section 6.5 on the cif-fob adjustment of imports.

9.9. Cross-border pipelines (oil and water) in Africa

At least six countries in Africa must find solutions for cross-border transport services through pipelines. These are Lesotho and South Africa (water), South Sudan and Sudan (oil) and Tanzania and Zambia (refined petroleum products). The contractual conditions differ, but from the rationale of National Accounts, all situations have in common that the pipelines – they are structures – are to be prorated according to the countries they are physically belonging to (SNA 4.13 to 4.15), possibly by splitting the transport activity into fictive branches per country which each of them contributing to the respective GDP.

The water pipeline between Lesotho and South Africa is run by a parastatal body jointly set up by both countries. Lesotho is providing water through a tunnel to South Africa which pays a lump sum for it and which participates in maintaining the tunnel. Lesotho treats the lump sum payment for the water as a royalty (thus not as a payment for output and hence not recorded as export but treating it as primary income from abroad). The maintenance of the pipeline is regarded as contributing to the GDP of Lesotho (as the tunnel is on its territory). It is done by the government of Lesotho which is reimbursed by a current international transfer from South Africa to the government of Lesotho.

After partitioning of former Sudan into the two countries, a political agreement on running the pipeline between South Sudan, the origin of the oil, and Sudan was made. The oil is extracted by a South Sudanese company which is widely owned by foreigners. The government gets roughly 40% of the sales, to be treated as royalty which in the SNA

is seen as a tax on land and hence as property income. The oil goes through pipelines to processing plants which both are located down the pipeline in Sudan. The processing is GDP of Sudan. South Sudan pays to Khartoum for the utilisation of the pipeline. According to the SNA rules, the pipeline part on South Sudan soil belongs to the capital stock of South Sudan by definition.⁸⁰ A notional unit (resident in South Sudan and contributing to its GDP) is running it. Any residual income of this notional unit is to be paid as primary incomes to the rest of the world, here to its owner in Khartoum. For the oil companies, the payments to the fictive unit for using the pipeline are intermediate consumption, for the pipeline the respective amount is output of transport services.

The Tanzania Zambia Mafuta Pipeline is a 1,710-kilometre long crude oil pipeline from Dar-es-Salaam to a refinery in Ndola, Zambia. It is run by Tazama Pipeline Limited, a company jointly owned by the governments of Zambia (66.7%) and Tanzania (33.3%). The pipeline is currently under privatization. The output and the intermediate consumption of the transport services generated by this pipeline are prorated to both countries according to the respective distance covered. The intermediate consumption is calculated by estimated input-output ratios. By definition, it does not include the rents on land paid to the regions and the countries out of the operating surplus of the pipeline company. Any construction activity dedicated to the pipelines are recorded as construction output as well as capital formation of the country and of the region the respective part of the pipeline is located in.

The Tanzania–Zambia Petroleum Products Pipeline is a proposed pipeline to transport refined petroleum products from Tanzania's sea-port of Dar es Salaam through central Tanzania and northern Zambia to the Zambian mining city of Ndola, in the Copperbelt Province. It is still under construction.

It goes without saying that the solution for the National Accounts about the pipelines must be reconciled with the BOP and should also be discussed with the country at the other end of the pipeline.

(79) ISIC Divisions 45 Wholesale and retail trade and repair of motor vehicles and motorcycles, 46 Wholesale trade, except of motor vehicles and motorcycles, 47 Retail trade, except of motor vehicles and motorcycles

(80) ISIC Divisions 45 Wholesale and retail trade and repair of motor vehicles and motorcycles, 46 Wholesale trade, except of motor vehicles and motorcycles, 47 Retail trade, except of motor vehicles and motorcycles

9.10. Mobile phone licenses

Most African countries have their own mobile phone companies or are granting foreign companies to use, against huge amounts of pay, the national spectrum for providing their services. As the companies are few, it may not be difficult to compile the production account out of the financial statements of these companies. However, one position – the payment for the license – may raise problems. At first glance, several options to record these expenses may come up: is it a payment for a service and hence intermediate consumption, is it the purchase of an asset (the license), is it a tax, a fee or something else? The discussion came up first in the year 2000 in the European Union where finally a decision has been taken by Eurostat⁽⁸¹⁾ which influenced the SNA. In its paragraphs, 17.316 ff., the SNA refers to this discussion and elaborates the frame for the classificatory decision each country must take on its own and in pondering the country-specific conditions of its licensing. If confined to the aspects of just GDP compilation, the relevant conclusions are:

- The spectrum (bandwidth) the mobile phone companies are allowed to use is a natural resource, in the SNA asset boundary falling under “contracts, leases and licenses”.
- License payments are neither taxes nor purchases of the spectrum itself. They are either rents (like rents on land or like royalties for using mineral deposits) or they are the purchase of the natural asset, depending on the contractual circumstances. The criteria for the decision between the two options are further outlined in the SNA.

For the calculation of GDP and its aggregates, it can be concluded that the mobile phone licenses must not be included in intermediate consumption of the mobile phone companies. If according to the national circumstances, the payment is classified as a purchase of a natural asset, the expenditure must neither be classified as gross fixed capital formation (GFCF) as GFCF is confined to produced non-financial assets while the license would fall under non-produced non-financial assets (AN223, permissions to undertake specific activities).⁽⁸²⁾ Consequently, there is also no consumption of fixed capital, even if in the commercial bookkeeping of the company there is a certain kind of depreciation of the value of the license.

9.11. Mobile banking

The recording of bank services according to the SNA 2008 is tackled in annex 12.3 below. Apart of that, there is a certain kind of financial services which is common in Africa but alien to the SNA. This service is commonly called mobile banking, not to be confused with online banking. The idea is simple and has been developed in countries with low banking penetration where many persons have a mobile phone account but not a bank account. Such persons use their mobile phone connection to transfer money to other persons in a similar situation, supported by the mobile companies they are clients of. For a transfer to take place - a recipient needs a mobile money account and the sender requires the recipient's mobile money account number. Funds can then be transferred in an instant.

Regions with a large mobile money footprint, such as Sub-Saharan Africa, have started leveraging the base of mobile money users to make inroads into traditional banking. An example is the M-Shwari account launched jointly by the Commercial Bank of Africa and Safaricom in Kenya, which offers savings and credit facilities that can be accessed entire through M-PESA (M for mobility, pesa Swahili for money), the mobile money platform.⁽⁸³⁾ According to the Financial Access Survey 2019 of the IMF, “East African countries have been the pioneers of the mobile money revolution.”⁽⁸⁴⁾

As already indicated, the SNA does not give explanations how to classify and how to record such kind of services. On the contrary, it even states (SNA 4.98b) that “it is usually the case that units providing financial services do not produce other goods and services and financial services are not provided as secondary production.”

Hence, until further notice, the respective African countries must apply the general rules of the SNA, accordingly, having in mind some starting points for consideration:

- If the mobile banking activity is carried out as primary activity of a separate institutional unit (as it may be the case for M-PESA), it must be decided whether it is a financial corporation or not. If so, the category “deposit taking corporations except the central bank” comes closest to the characteristics of mobile banking, explicitly including “Post office giro institutions, post banks, giro banks” (which may be halfway similar in nature).

- The decision gets more difficult when the mobile banking activity is a secondary activity of the cell phone company and cannot be identified and segregated as a quasi-corporation. If so, it must be checked whether at least a separate establishment of the same non-financial corporation (the cell phone company) can be delineated.⁽⁸⁵⁾

- The industrial classification does not provide a class which fits to the characteristics of mobile banking. The ISIC position coming as closest as possible would probably be 6419 “Other monetary intermediation” which includes, among others, “postal giro and postal savings bank activities”.

- Estimating the output of services of mobile banking may be much more straightforward, provided that the payments (fees) can be taken out of the financial statements of the mobile phone companies.

It would make sense to classify mobile banking in accordance with the central bank which also has to decide whether and how to supervise such companies and whether and how to include the liquidity in the respective money supply it is obliged to measure for the national liquidity policy. In Zimbabwe, this issue has already raised political discussions as reported by the media in March 2020.⁽⁸⁶⁾

9.12. Owner-occupied dwellings

SNA 6.117: “Households that own the dwellings they occupy are formally treated as owners of unincorporated enterprises that produce housing services consumed by those same households. When well-organized markets for rented housing exist, the output of own-account housing services can be valued using ... the estimated rental that a tenant would pay for the same accommodation, taking into account factors such as location, neighbourhood amenities, etc. as well as the size and quality of the dwelling itself. The same figure is recorded under household final consumption expenditures. In many instances, no well-organized markets exist and other means of estimating the value of housing services must be developed.” In this paragraph, the SNA leaves open what to do in the latter case which is relevant in many African countries outside their capital cities. But hints are given in other paragraphs:

- The valuation of output for own final use is specified in SNA 6.125 for the case that market prices cannot be obtained. The second-best procedure then is to add up the cost: intermediate consumption (in case of dwellings mainly for minor maintenance and repair), for compensation of employees, consumption of fixed capital and a net return to fixed capital.

- The labour cost of the owner himself are not to be included.

- Mark-up for net return on capital (explained in SNA chapter 20, Capital services and the National Accounts).

Especially in the African rural areas, the valuation of services of owner-occupied dwellings is very difficult. To curb the impact of uncertainty for the intertemporal comparison, most countries use annual extrapolations, starting with the latest census or survey providing housing data and simply using a combination of growth of house rents and of populations for that purpose.

9.13. Offshore activities

9.13.1. The diverse meaning of “offshore”

The present version of the ISIC classification stems from 2005. Throughout its text, it uses the term “offshore” only once. It defines that fishing in coastal waters or in offshore waters is to be subsumed under ISIC 031 (fishing). The SNA 2008 uses the term “offshore” only twice: (i) in connection with oil platforms (par. 14.62b) and (ii) for specifying the economic territory of a country where trade zones and “offshore financial centres” (if under the control of the government) are part of. But in reclassifying the financial corporation sector the SNA 2008 has more intensively dealt with other activities which, besides offshore fishing or oil platforms in coastal or international waters, are also often termed as “offshore”. These are mainly banking activities in island countries, some of them commonly perceived as “tax havens”. Offshore banking can be referred to as doing banking in a country where one does not reside.⁽⁸⁷⁾ It is dealt with in the next section.

(81) https://ec.europa.eu/eurostat/documents/1015035/2041337/ESTAT-decision-Allocation_Mobile_Phone_Licenses_UMTS-20000714.pdf/3ec66e5e-d150-4b73-9e18-b63028855c73
 (82) In the full application of the SNA, the expenditure of the mobile phone company would then be recorded in the capital account as acquisition of contracts, leases and licenses, reversely to be recorded for the recipient of the payment (general government).
 (83) <https://www.worldremitt.com/en/mobile-money>
 (84) IMF, Mobile Money Notes 2019, <https://www.imf.org/en/News/Articles/2019/09/27/pr19359-imf-releases-the-2019-financial-access-survey-results>

(85) SNA 5.15: “If a secondary activity within an enterprise is as important, or nearly as important, as the principal activity, then that activity should be treated as taking place within a separate establishment from that in which the principal activity takes place.”
 (86) <https://www.zimwe.net/2020/03/04/banks-cry-out-to-parliament-as-ecocash-threatens-to-get-them-out-of-business/>
 (87) http://www.taxhavens.biz/tax_haven_banking

But there are also other activities which have gained weight during the last decades, perceived as an outcome of “globalization”. In Seychelles, for example, a special body corporate, the Seychelles International Business Authority, is licensing and regulating primary offshore activities of International Business Corporations which go far beyond banking business.⁸⁸ The aspects of other offshore activities than banking are dealt with in sections 9.13.3 and 9.13.4.

9.13.2. Offshore banking

The SNA strictly applies the principles of residency and of ownership. From the first one, it follows that offshore companies belong to the economy they are located in, regardless of their size of employments or assets. “Located” can mean that there is significant offshore economic activity which can (and should) be measured in terms of the production and the generation of income account. This definitely holds for the provision of international bank accounts to clients from abroad which are interested in depositing their money outside the grip of the fiscal authorities of their home country. For long, Switzerland and the Caribbean island countries were well known for providing such services. This kind of banking may go along with the usual bank services like provision of credit cards or financial intermediation. Hence, the output of such banks should be calculated like the one of the domestic banks, although the share of FISIM output might be low as compared to revenues from fees.

It depends on the supervision rules of the island country whether such banking services are empirically observed or not. In Africa, properly recording the offshore banking is relevant especially for two countries: Mauritius and Seychelles. In Mauritius, the output of offshore banks is measured in the same way as for the domestic commercial banks. It is based on FISIM and services charged (income from dealings in foreign exchange, commissions, fees, etc.). The information is obtained from quarterly and annual surveys of banks conducted by Statistics Mauritius, complemented by data from the Bank of Mauritius.

9.13.3. Other offshore activities

“Located” in the above-mentioned principle of residency can also mean to have units with the sole purpose to own financial assets, often with nil or only few staff and with nil or only few physical assets, often not more than a “brass plate”. In the SNA, the units in quest are also classified as financial corporations, here under S127 “Captive financial institutions and moneylenders” which is one of the 9 sub-sectors of sector S12. The more ample sub-sectoring was one of the changes made in the SNA 2008 over its 1993 vintage. S127 is made up of four categories a to d, listed in SNA 4.114:

- a. Units which are legal entities such as trusts, estates, agencies accounts or brass plate companies.
- b. Holding corporations that hold only the assets (owning controlling-levels of equity) of a group of subsidiary corporations and whose principal activity is owning the group without providing any other service to the enterprises in which the equity is held, that is, they do not administer or manage other units.
- c. SPEs or conduits that qualify as institutional units and raise funds in open markets to be used by their parent corporation.
- d. Units which provide financial services exclusively with own funds, or funds provided by a sponsor to a range of clients and incur the and incur the financial risk of the debtor defaulting, including
 - Moneylenders.
 - Corporations engaged in lending (for example providing student loans, import/export loans) from funds received from a sponsor such as a government unit or non-profit institution.
 - Pawnshops that predominantly engage in lending.

For the offshore activities other than banks, the category a is presumably the most common one. Mauritius informed that for the “trusts, estates, agencies accounts or brass plate companies”, they follow this classification and that for the output calculation they follow the rules given in the handbook (UNSD / European Central Bank) on “Financial Production, Flows and Stocks in the System of National Accounts”⁸⁹, par. 3.13. These rules foresee to estimate their

output as the sum of costs, i.e., intermediate consumption, compensation of employees, capital costs and other taxes (less subsidies) on production. Given the fact that, by definition, these units are small, their output may be low or even insignificant. But if estimated at all, it is to be reconciled with the BOP as under uses it is to be recorded as export of a service. The respective ISIC position for the production of this service would in most cases presumably be 6420 Activities of holding companies.

The problem arises when, as in the case of Mauritius, the National Accounts cover the sequence of the institutional sector accounts and not just production and GDP. Despite of low output and low economic activities, the cross-border shifts of profits which often are the sole purpose of these entities can have a huge impact on the net primary incomes from the rest of the world. The techniques of international business companies applied to enable such shifting are nicely summarized in a paper prepared for a meeting of the Advisory Expert Group on National Accounts (the work groups preparing the next SNA revision) in November 2018.⁹⁰ This paper addresses the challenges of globalization for the National Accounts (which is also the title). It reveals the huge problems the proper recording of these units, often summarized as Special Purpose Entities (SPEs), creates. In the SNA, the SPEs are defined in par. 4.55. Their meaning for the revision of the SNA is already highlighted in the introduction to the SNA 2008 in its part “globalization and related issues”:

“In recognition of the changing structures of production and finance in many economies, guidance is now provided about when “special purpose entities”, which are sometimes called shell companies or brass plate companies and which can be created by corporations or the government, should be recognized as institutional units, how they should be classified, and how their operations should be treated.”

For coping with them, the IMF has constituted a Task Force on Special Purpose Entities. Its latest report has been published in October 2018, <https://www.imf.org/external/pubs/ft/bop/2018/pdf/18-03.pdf>. Among others, it elaborates proposals for redefining the SPEs.

9.13.4. A special case: intellectual property rights

To great extent, the problems with the SPEs have to do with the SNA’s principle of applying the criterion of the change of economic ownership for transactions between units. In the 2008 SNA (3.26), economic ownership is defined as follows: “The economic owner of entities such as goods and services, natural resources, financial assets and liabilities is the institutional unit entitled to claim the benefits associated with the use of the entity in question in the course of an economic activity by virtue of accepting the associated risks.”

This definition is meant for institutional units. A change in economic ownership between institutional units would typically coincide with a financial transaction between them and would therefore coincide with a change in legal ownership. But for transactions between institutional units belonging to the same international enterprise group, the transfer of ownership may be arbitrarily organized in a way that assets are held in a country where the taxes are low and/or the supervision is weak, hence favourite for the enterprise group as a whole. When this is done with assets like patents or software or other kinds of intellectual property products (IPP), there is no need to allocate them to the country of residence of the physical production the property products are required for. On the contrary: the allocation of these “footloose” assets can freely be chosen in a way that the transfer prices for using the IPPs held at the residence of the headquarter are maximized, sucking the profits out of the other members of the enterprise groups which are located in countries with higher rates of taxes.

The well-known example for this is Ireland where, among others, global players like Apple or Google have located their headquarters, using the opportunity of shifting the profits to Ireland where corporate taxes are low and, because Ireland is a member country of the EU, the stigma of operating from a low-tax country is limited. But it should be noted that most of these headquarters in Ireland are more than just a holding company as per ISIC 6020. Over the years, some of them have grown to a size of several thousand employees.

(88) For more details see www.offshore-ibc-incorporation-offshore-company-formation.com/siba_seychelles_international_business_authority.html. The term “International Business Corporations” (IBCs) is a special legal term not only used in Seychelles. But it is not a term used in the SNA.

(89) <https://www.ecb.europa.eu/pub/pdf/other/handbookofnationalaccounting2014en.pdf?ebedd86643c52c4bbfedd3135cf6e21a>

(90) https://unstats.un.org/unsd/nationalaccount/aeg/2018/M12_2a4_Challenges_globalization_NA.pdf

In the National Accounts, the IPPs are classified as “produced non-financial assets”, hence revenues from utilizing them in the process of production are to be recorded as gross value added and, as parts of it, as consumption of fixed capital and as net operating surplus. For Ireland’s GDP and for its GNI, this had created exorbitant growth rates in 2015 which raised disbelief among experts⁹¹, but which finally had to be confirmed by Eurostat as being in line with the international guidelines (SNA, BPM).⁹²

The Ireland case is even more complicated as the headquarters of some international players also practice processing of goods abroad which under certain conditions triggers the recording of international flows of services rather than the recording of the physical flow of goods. More of these interesting practices can be found in the aforementioned paper for the meeting of the Advisory Expert Group on National Accounts.

It is assumed that, so far, the practices observed for Ireland are not, or not yet, valid in the African island countries. But if practices like in Ireland were observed, then the prevalence of offshore banks and SPEs may have a much more significant impact on the GDP as they have by now. International enterprise groups may decide to follow the Irish example and to allocate intellectual property products to units of this group which are resident in Africa. This can happen on short notice. Therefore, it is necessary to observe the international discussion about these aspects of globalization and possibly to participate actively in it.

9.14. Research and development

One of the revisions in the SNA 2008 was the treatment of expenditures on research and development which – if successful⁹³ - are not to be recorded as intermediate consumption anymore. They are, instead, to be recorded as gross fixed capital formation, in the asset boundary classified as fixed assets of type AN 117, “intellectual property products”, sub-position AN 1171, “research and development”.

In general, output of R&D should be valued at market prices if purchased (outsourced) or, if produced in-house, at the sum of total production costs plus an appropriate mark-up for consumption of fixed capital (if on own account) and including the cost of unsuccessful R&D. Research and development undertaken by government units, universities, non-profit research institutes, etc. is non-market production (cost approach). R&D does not include the increase of human capital.

If R&D is carried out on own account, it must not only be recorded as GFCF. It must also be recorded as output for own-account capital formation. Therefore, the new treatment of R&D results in an increase of GDP in amount of capitalized R&D.

If R&D is carried out on own account and at a significant scale, it should be treated as an establishment of its own. If so, its economic activity would be classified under ISIC M, “Professional, scientific and technical activities”, Division 72, “Scientific research and development”. The same holds for specialized commercial research laboratories or institutes. Their output would be valued by sales, contracts, commissions, fees, etc. in the usual way.

For most African countries, R&D is one of the minor activities. Nevertheless, it is important to enrich the economic censuses and surveys accordingly, when questions about capital formation are designed.

9.15. From GVA to GDP

Meanwhile, all countries in Africa are measuring value added of their industries by using basic prices, or they are, like Ethiopia, in transition to the basic prices, coming from valuation at producers’ prices.

Most African countries have succeeded to move from the application of the SNA 1993 to the SNA 2008, or they are on a good path to achieve this. For them, it is not necessary anymore to show the “imputed bank service charge” as a position of transition from GVA of the industries to the GDP. The purpose of subtracting the “imputed bank service charge” as a lump sum from total gross value added had been to allocate the imputed output of the banks to a certain user category, albeit an artificial one. With the allocation of FISIM to the various user categories as per requirement of SNA 2008⁹⁴, it only needs to add the taxes (less subsidies) on the products to the total of GVA at basic prices in order to arrive at GDP. Hence, under SNA 2008, it must be ensured for all industries that their intermediate consumption had been enhanced by the amount of FISIM imputed for that purpose.

The SNA 2008 commonly speaks of just “GDP”; the term “GDP at market prices” is rarely used (only in SNA 7.10 and SNA 14.10).

It is important to differ between the taxes on the products – they vary with the output – and the taxes on production (transaction code D.29) which are levied on the production process as such, e.g. as taxes on land or on vehicle or on the payroll amount. The latter category (D.29) is not to be added to GDP as it is part of GVA at basic prices, already. Taxes of type D.29 are to be paid out of the operating surplus of the producers.

D.21 Taxes on products

D.211 Value added type taxes (VAT)

D.212 Taxes and duties on imports excluding VAT

D.2121 import duties

D.2122 Taxes on imports excluding VAT and duties

D.213 Export taxes

D.214 Taxes on products except VAT, import and export taxes

D.29 Other taxes on production

The SNA favours the concept of basic prices. But when data sources do not permit valuation at basic prices, the SNA concedes that countries may calculate output at producers’ prices, instead. In this case, all taxes on both products and production (possibly excluding any VAT type taxes) will be included in the value of output and all subsidies on both products and production will be excluded. It only needs to add the taxes (less subsidies) on imports to get the GDP:

$$\text{GDP} = \text{total GVA at producers' prices} \\ + \text{taxes on imports} - \text{subsidies on imports.}$$

(91) See, for example, <https://www.theguardian.com/business/2016/jul/12/irish-economic-growth-revised-figures-foreign-investment-aircraft>

(92) Similarly OECD: <http://www.oecd.org/sdd/na/irish-gdp-up-in-2015-OECD.pdf>

(93) Successful means that R&D “provides an economic benefit to its owner” (SNA 10.103). If this is not the case, expenditures on R&D should be treated as intermediate consumption.

(94) For more details see annex 12.3.3.

10.

Special technical topics GDP expenditures

10.1. Consistency issues

Apart of measuring GDP via production of goods and services, GDP may also be calculated in terms of the uses of goods and services produced or imported:

- Individual and collective consumption,
- Gross capital formation,
- Net sales to the rest of the world (exports minus imports).

These uses are valued at the prices of the purchasers. They are paid from the income generated in their production. Therefore, this is called the expenditure approach.

African countries usually compile GDP from the production side (exception South Sudan, see annex 12.1.3.4) while the expenditure side of GDP is often covered by independent calculation of selected aggregates, only. For the reconciliation of the two sides of GDP and the treatment of discrepancies, please see section 11.2. Apart of the overall conceptual identity of total GDP production and total GDP expenditures, there are several requirements of plausibility the compilers must heed:

- Final consumption expenditures of households must fully include ...
 - Output for own final consumption (e.g. self-consumption of the farmers, see section 9.2).
 - The equivalent of wages and salaries given in kind to employees (see section 4.2.2).
 - The services of owner-occupied dwellings (see section 9.12)
 - The services of FISIM as far as finally consumed by households (see annex 12.3.3)
- Final consumption expenditures of general government must widely match the non-market output of the government services under various ISIC sections (not only administration), deviating only by sales of non-market output (see section 4.5).
- Gross fixed capital formation must fully include the output for own capital formation as per production side of GDP
- Gross fixed capital formation of buildings must widely match the output of construction as per production side of GDP, deviating only by output for maintenance, by output of architects or lawyers or other services related to ownership transfer (imports and exports of construction services neglected). For more details see section 9.6.

• Imports must be valued fob. Imports and exports must be reconciled with the BOP (see chapter 6).

As most of these consistency issues are already tackled in other chapters, this chapter on GDP expenditures is confined to complementary remarks on household final consumption and on capital formation.

10.2. Household final consumption expenditure

National Accounts record three kinds of consumption as final consumption: households' consumption, general government's consumption and NPISH consumption. All final consumption expenditure of households and of NPISH is individual in nature by definition. Final consumption expenditure of General Government is either collective or individual in nature. By definition, enterprises have no final consumption. The scheme shows the relation of the aggregates. In brackets are the SNA transaction codes. The split of government consumption into its collective and its individual part is explained in section 4.5.⁹⁵ In many African countries, meanwhile the Government Finance Statistics allow this split to be done easily by using the classification codes of the COFOG.

FINAL CONSUMPTION EXPENDITURES (P3)		
Individual consumption expenditure (P31)		Collective consumption expenditure (P32)
Households (S14)	NPISH (S15)	General Government (S13)

In the African countries, usually the data on household consumption expenditures are taken from Household Budget Surveys, from Household Income and Expenditure Surveys or similar sample surveys with possibly different names. But all these surveys are multi-annual ones and require extrapolations, often done with a ratio combining the inflation rates with the growth of the population.

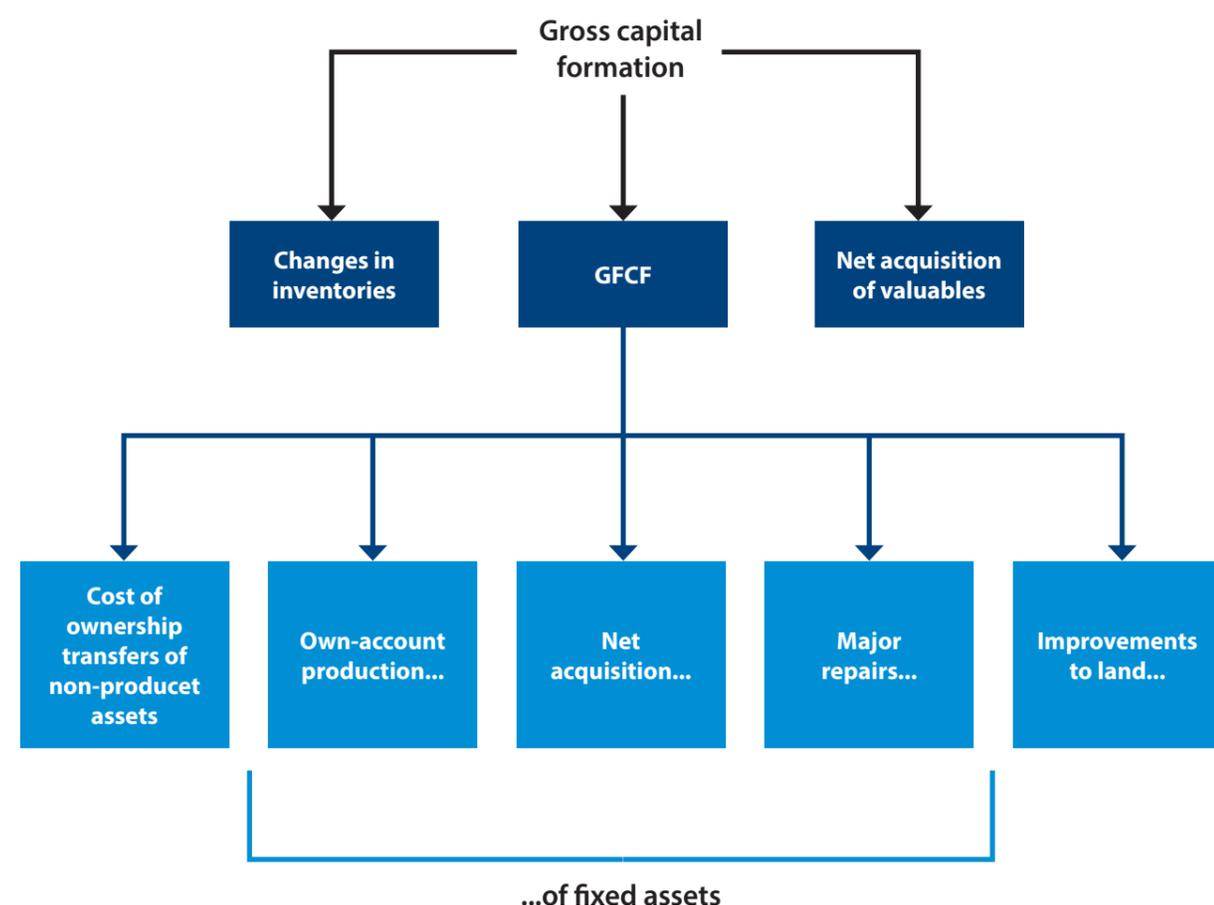
(95) If National Accounts are recorded as institutional sector accounts, countries make use of recording a "social transfer in kind" to shift expenditures from collective consumption to individual consumption of the households, e.g. expenditures for education or for medical goods and services. Especially for this option, the SNA 1993 as well as the SNA 2008 foresee a special deviation in the sequence of accounts and in the balancing items ("adjusted disposable income"). The aim is to show "actual individual consumption" (P41) and "actual collective consumption" (P42).

10.3. Gross capital formation

In common parlour, "capital" is often associated with "money" or related financial assets. But in the SNA, capital formation is confined to transactions in non-financial

assets. Gross capital formation must not be confused with gross fixed capital formation (GFCF). In the SNA, "gross capital formation" is defined as Gross Fixed Capital Formation (GFCF) plus changes in stocks and plus net acquisition of valuables and refers to "real" capital.

The scheme shows the definition tree, visualizing that GFCF is just one part, albeit the most important one, of gross capital formation.



GFCF is made up of the five components shown in the scheme, with the net acquisition of fixed assets as the most important one. It should be noted that cost of ownership transfer of the fixed assets are to be included in the value of GFCF while in case of acquisition of non-produced non-financial assets, e.g. land, only the cost of the transfer of the ownership are entering GFCF.

Produced (non-financial) assets are either fixed assets or inventories or valuables. Inventories are further sub-classified as follows:

Produced non-financial assets (AN1)

- Fixed assets (AN11)
- Inventories (AN12)
 - Materials and supplies (AN121)
 - Work in progress (AN122)
 - Finished goods (AN123)
 - Military inventories (AN124)
- Valuables (AN13)

Non-produced non-financial assets (AN2)

In the SNA 2008, the fixed assets (AN11) are further sub-classified as

- Dwellings
- Other buildings and structures
 - Non-residential buildings
 - Other structures
 - Land improvements
- Machinery and equipment
- Weapons systems
- Cultivated biological resources
 - Animal resources yielding repeat products.
 - Tree, crop and plant resources yielding repeat products.

As outlined in sections 9.13 and in annex 12.2.4, the recording of R&D and of military weapons as (non-financial) assets is new in the SNA 2008.

In recording capital formation, some countries face problems in estimating the output of living animals, having even more problems to differ between animals joining the inventories (mainly animals for slaughter) and animals joining the capital stock of fixed assets, e.g. dairy cattle, animals for breeding or for draught power. As comprehensive livestock censuses are costly and rare, the data can often only be estimated based on extrapolation models done by special experts in the responsible ministry.

Valuables are a very special kind of goods. They are produced, but neither used for production nor for consumption. They are held as a store of value over time, instead. In most countries, except for Namibia or Botswana or other countries of producing precious metals or stones, valuables are a minor position.

"Inventories are produced assets that consist of goods and services, which came into existence in the current period or in an earlier period, and that are held for sale, use in production or other use at a later date. Inventories consist of stocks of outputs that are still held by the units that produced them prior to their being further processed, sold, delivered to other units or used in other ways and stocks of products acquired from other units that are intended to be used for intermediate consumption or for resale without further processing" (SNA 10.12).

The statistical observation of changes in inventories is difficult if to be done for the whole economy. Some African countries, especially the ones producing oil or precious stones at a significant scale and in big companies, may know about changes in the stocks of such goods. They may use this as partial information for recording changes in inventories, possibly assuming that for the rest of the economy the stocks remain the same as in the previous year.

11.

Aspects of data transmission, publication and dissemination

11.1. General recommendations

In sharing National Accounts data and in using them for international anthologies like yearbooks or for supra-national aggregates, special attention should be given to the aspect of ownership of the data. Those who are compiling them will presumably claim the ownership and thus to have the last say in any changes and in any transfer or dissemination of the data. Hence, clarifying the ownership is a must, especially when the data have gone through routines of adjustments and reconciliations outside the realm of the original producer.

Hence, the responsibilities for delivery of data or other input for joint international statistical products is important. But responsibility can also include the commitment to ensure certain standards of data quality. An important, but sensitive component of responsibility is the commitment to adhere to the ethics of official statistics laid out in the African Charter on Statistics⁹⁶ and in the “ten commandments” of the United Nations.⁹⁷ For National Accounts, this would especially imply to withstand any influences from outsiders to shift the results of GDP calculation in a desired direction. With regard to quality, the commitment to the data dissemination standards of the IMF are also important. Most African Countries (40 out of 55) have agreed to adhere to the IMF’s Enhanced General Data Dissemination Standard (e-GDDS).⁹⁸

(96) African Union, African Charter on Statistics, <https://au.int/en/treaties/african-charter-statistics>

(97) United Nations Statistical Department, Fundamental Principles of Official Statistics (A/RES/68/261 from 29 January 2014), <https://unstats.un.org/unsd/dnss/gp/fundprinciples.aspx>

(98) The e-GDDS supersedes the former General Data Dissemination System. It aims to encourage member countries of the IMF to improve data quality; provide a framework for evaluating needs for data improvement and setting priorities in this respect. Moreover, e-GDDS guides the countries in the dissemination to the public of comprehensive, timely, accessible, and reliable economic, financial, and socio-demographic statistics. Source: <http://datastandardshelp.imf.org/knowledgebase/articles/816624-egdds-online-help-with-open-data-platform-odp>

Given the sensitivity of the GDP data, it is imperative to agree on firm and detailed rules for their approval. It needs defining the approving authorities and the respective consequences in case that an approval is denied or postponed. Close to the questions of approval are those of the release procedure under predetermined conditions, be it about the time of the release, the scope of the data to be released (including deepness of classification) or the beneficiaries of the release (only for internal use or for the public at large).

From the more technical point of view, it is imperative to enhance the presentation of the numeric results by proper explanations about the concepts, methods and data sources, helping the users to understand the essence of the compilation work. This can be done in various forms, e.g. footnotes, methodological explanations or at least hints to the international standards the compilation is based on. This non-numerical part of presenting the results is usually called “meta data”. Good compilers of National Accounts should be brave enough to include into them also hints on weaknesses and problems faced in producing the results.

Finally, for the advanced national statistical institutes, it is meanwhile standard to provide release calendars informing the users and especially the media about the exact timing of the release of the results. This avoids misperceptions that “the government” prefers certain media or journalists for the sake of positive news at the time of release. But it is also a help for users to prepare for implementing upcoming results in the analytical work they may have under preparation.

11.2. Discrepancy between independent GDP estimates: show or conceal?

For assessing the quality of GDP calculation, an important criterion is whether GDP is at least calculated independently from the production side as well as from the expenditure side. If this is the case and various data sources have been used, it is unavoidable that, despite of conceptual consistency between both results of GDP, there is a discrepancy between the two, just because of the fact that any error in any source will result in a discrepancy. It is up to the compilers in the country whether to investigate in the discrepancy and to minimize it or whether to accept the discrepancy as tolerable. The decision must ponder the expected efforts of investigation against the expected gain of accuracy.

Once the decision is to stop further investigation, the compilers must decide whether to show or whether to conceal the remaining discrepancy. There are, in principle, two alternatives the countries may choose:

- Showing the discrepancy as such and even in number is mainly chosen with respect to experienced users. Such users may appreciate to see the discrepancy and may feel to be in a better position to assess the quality of the results. Moreover, they may perceive it as an honest practice to see the discrepancy published.
- The alternative is that the discrepancy is attached to the aggregate of the expenditure side the compilers feel the most appropriate. This can be changes in inventories as this is often based on incomplete data, anyway. Or it can be household consumption as this is commonly the biggest aggregate of expenditures and therefore not much disturbed by the inclusion of the discrepancy. The compilers would then add a footnote indicating that this aggregate is “including statistical discrepancies” without giving the discrepancy in number.

In Africa, only few countries have two independent approaches and, hence, the problem to choose the variant. Nigeria has a kind of compromise: it shows the discrepancy only in its base year (the last one of it being 2010) which is also the reference year for their latest SUT.

But many countries do not compile all aggregates of the expenditure side independently. If they show GDP expenditures at all, they often use household consumption (e.g. Uganda, Tanzania, Egypt, Zimbabwe) or changes in inventories (e.g. Ethiopia) as a global balancing item, automatically including any discrepancies.

If the explanation of this practice is hidden somewhere in the meta data, the user may paradoxically misperceive the results of that country as better in accuracy than the results of a country with a full-fledged two-sided approach to GDP and consequently and honestly evidencing the taint of a “discrepancy”.

The SNA tackles this issue in its paragraphs 18.14 to 18.19 and elaborates the pros and cons of explicitly showing the discrepancy or not. It remains neutral about a preference for one of the two.

11.3. SDMX as the upcoming tool for data transmission⁹⁹

SDMX is an international initiative for harmonizing (with ISO-certificate) the transmission of statistical data, sponsored by the United Nations (represented by UNSD), the Bank of International Settlement (BIS), the European Central Bank (ECB), the World Bank, the IMF, the OECD and Eurostat.

This initiative was a reaction on increasing demand (and on response burden) accruing from more and more intensive use of the internet for the purpose of data transmission between international organizations, between government institutions, between private institutions or between partners from all aforementioned groups of users. The possible objects of transmissions are data or files from surveys or from administrative sources, meta data or any kind of other data in various formats.

SDMX is basically a tool for exchange between machines: from one server, PC or laptop, to another one, basically using XML data formats. The technology for it is meanwhile quite advanced and makes the checking and validation of data easier. The SDMX files can easily be converted to files in format of EXCEL or CSV. Some of the respective tools are developed by Eurostat which it already uses as a standard for transmission among European statistical institutes. The tools developed by Eurostat are widely open source ones and can be downloaded from Eurostat websites.

Working on SDMX is made up of two components: (i) Statistics Working Team (SWT) and (ii) the Technical (IT) Working Team (TWT). SWT is the more unstable, volatile part of it while TWT is carried out in more stable and steady processes. SDMX is a statistics project rather than an IT project as it mainly deals with a special “language” related to the precise specification of data: concepts, attributes, dimensions, measures, units. The data structure definition (DSD) is result and core of it. For avoiding redundancy and duplication of work, there is a global registry of SDMX artefacts (access through website) which for some “cross-domain concepts” like labour statistics, education statistics, R&D, National Accounts, price statistics, BOP or trade statistics is already well established.

Users of SDMX can access the website of this registry and can take their specifications from there; or they can upload new specifications, e.g. classifications or definitions, up to this registry. All this will contribute to avoid that the same data are transmitted or stored in more different ways or formats than necessary.

SDMX is materialized either as a “pull” or as a “push” activity. The pull activity is the preferred one as the user can at any time update his or her files (presupposed that access to the data had been granted to him or her).

Eurostat regularly organizes training on the use of SDMX. But African applicants are not prioritized for it. Thus, UNECE – the Economic Commission for Europe – wants to promote it in Africa as well. But for Africa, the situation is complicated as it is very difficult to get experts for it.

The African Statistical Yearbook (ASYB) has been identified as an ideal project to learn about SDMX in Africa and to promote it. The funding comes widely from AfDB which also intends to hire special experts for further support.

IMF is already regularly collecting the data for its General Data Dissemination Standard (e-GDDS) through SDMX.

12. Annex

12.1. History of National Accounts in Africa

12.1.1. The international development

The System of National Accounts (SNA) arose in response to economic monitoring needs first felt during the 1930s depression and the Second World War. The United Nations (UN) first published the SNA in 1953.¹⁰⁰ In its initial chapter, it describes the SNA as a “closed network of economic transactions” and briefly characterizing its genesis by saying there was a “... practical need for information about the working of the economic system as a whole and the way in which its various parts are related to one another. The practical need arose largely from the great depression of the 1930’s and the subsequent problems of economic mobilization and war finance in the Second World War. In the post-war period, the information was desired to throw light on problems of economic reconstruction and development and, more generally, for assessing economic change as a background for economic decision-making in connexion with public policy”.

(99) Sources: (i) presentation of Rafik Mahjoubi, Technical Team Leader, Statistics Department (ESTA) of AfDB, during the annual meeting 2017 for the ASYB in Lomé, Togo. (ii) Website SDMX: <https://sdmx.org/>

(100) A System of National Accounts and Supporting Tables, Report prepared by a group of national income experts appointed by the Secretary General, United Nations, Department of Economic Affairs, Statistical Office, Studies in Methods, No. 2, New York, 1953

The SNA has been revised three times (1968, 1993, and 2008) to account for growing demand for the extension of the system towards more complex monitoring of a diversifying global economy. The latest version of the system (SNA 2008) measures production, income, consumption, savings, and capital formation and financing for individual sectors and for the total economy. It also includes linkages with various monetary and quantitative databases relating to different types of activities through Satellite Accounts. SNA is a powerful and flexible tool to provide the detailed economic information required to meet analytical and policy needs.

Almost all countries, even former socialist countries, have transitioned from the socialist Material Product System (MPS) to the SNA to measure their economies, albeit often only in parts. However, only a few countries have the capacities and the empirical basis for fully implementing the system. But the intention of all UN member countries, including the developing ones, is to align their NA to the extent possible to the SNA.

“Some countries may be able, at least initially, to calculate only a small number of accounts and tables for the total economy with little or no disaggregation into sectors, but a reduced set of accounts or tables does not constitute an alternative system. It is not appropriate to try to lay down general priorities for data collection when economic circumstances may vary considerably from one country to another. In practice, priorities can only be established country by country by economic analysts or policymakers familiar with the particular economic situation, needs and problems of the individual countries in question” (SNA 2008, par. 1.4 f.).

For the SNA’s advice of proceeding by “milestones”, see section 2.5.

12.1.2. The development on the continent

In Africa, the development of statistics was mainly driven by initiatives from the three major Pan-African institutions, the United Nations Economic Commission for Africa, the African Development Bank and the African Union Commission, formerly Organization of African Unity (OAU).

During the 1960s, many African countries gained independence from former colonial rulers. Through the OAU, they initiated a process of continental integration intended to ultimately foster and accelerate economic and social development as well as political stability. The African integration agenda, as outlined in treaties and protocols endorsed by African Heads of State and Government, required quality statistical information and harmonized data across time and space. Continental statistical development frameworks include the “Addis Ababa Plan of Action for Statistical Development in the 1990s”⁽¹⁰¹⁾ and the “Reference Regional Strategic Framework for Statistical Capacity Building in Africa”⁽¹⁰²⁾, both not giving extraordinary weight to National Accounts.

During the last decade, it was especially one document, the Strategy for the Harmonization of Statistics in Africa (SHaSA), which paved the way for speaking of an African Statistical System, with National Accounts as one of its core elements. The SHASA was released jointly by the aforementioned Pan-African institutions and adopted by the African Heads of State and Government in July 2009.⁽¹⁰³⁾ At that time, it assessed the situation of the National Accounts on the continent as follows:

“African countries fall into three groups: (i) those that produce and publish detailed national accounts regularly and in a timely manner; (ii) those that produce accounts but do not publish them regularly; and (iii) countries that have difficulties in producing regular basic accounts.”

In the same document (SHASA 3.2.1), it stated:

“Some African countries fully comply with the System of National Account (SNA) 93 for the compilation of their national accounts, others comply only partially (they are in transition between the SNA 68 and SNA 93), while others still compile their national accounts according to SNA 68 conventions.”

Consequently, during the first meeting of StatCom-Africa⁽¹⁰⁴⁾ in 2008, the Pan-African institutions created the African Group on National Accounts (AGNA) at the continental level “to play a catalytic role in the implementation of the SNA” (SHASA 3.4.1). For the subsequent years, the AGNA was one of the 18 Special Technical Groups under the SHaSA. Until 2016, it was the platform for annual meetings of all countries, RECs, African Training institutes and other international organizations, mainly focused on developing strategies for launching and implementing the SNA 2008.

The ShaSA was revised and updated as a strategy for the years 2017 to 2026, renamed as SHaSA II⁽¹⁰⁵⁾. For the reviewed description of the AGNA role as “Specialized Technical Group –African Group on National Accounts & Price Statistics STG-NA&P (AGNA)”, see its section 4.2.3.

Moreover, especially in the context of National Accounts which often are politically very sensitive, another document must be mentioned. It is the African Charter of Statistics⁽¹⁰⁶⁾, providing ethical principles for producing and releasing official statistics.

12.1.3. History of National Accounts in selected African countries

12.1.3.1. ETHIOPIA

In the early 50s, the country’s central bank, the National Bank of Ethiopia, had the responsibility to bring out the National Accounts estimates, based on a crude methodology, for their internal consumption and policy making and for meeting international requirements. Unfortunately, they did not maintain a proper documentation on this aspect.

For the first time, a full-fledged National Accounts Statistics based on the first ever version of the System of National Accounts (SNA 1953) was brought out in 1960-61. The production and expenditure approaches were adopted in the estimation procedure. It was well documented and brought out in the form of sources and methods.

Over the period of time, the task of compiling as well as publishing the macro-economic aggregates such as GDP and other related estimates was carried out, one after another, by several organizations and agencies such as planning commission, the national statistical office (Central Statistical Agency), Directorate of Planning etc.

Over the years, the National Accounts were regularly updated when new censuses or surveys were made available. The first revisions were made with base years 1980-81, 1987-88, 1999-2000 and 2010-11, respectively (years given as per Gregorian calendar). A brochure was brought out for back series covering the period from the year 1961 onwards. Presently, Ethiopia is launching its revision of 2015-16, including the adoption of the SNA 2008.

Since long, the National Accounts are in the hands of the national planning commission, albeit with some changes of its official name. Presently, it is the National Accounts Department of the Planning and Development Commission of Ethiopia.

Ethiopia compiles its GDP also on quarterly basis. In 2019, Ethiopia has started an initiative to launch a coordinated system of regional GDP calculation for its nine regional states and its two administrative territories. This initiative is ongoing.

12.1.3.2. EGYPT

Like Ethiopia, Egypt is one of the few countries carrying out its National Accounts outside the national statistical office. The compilation is even bifurcated:

- The National Accounts Department in the Ministry of Planning is responsible for compiling both Quarterly and Annual National Accounts.
- The National Accounts Department in the Central Agency for Public Mobilization and Statistics (CAPMAS) is responsible for compiling Supply & Use Tables, Input Output Tables and Social Accounting Matrix (SAM). The last publication of a SUT and an Input-Output Table was for year 2014/2015.

Egypt compiles the institutional sector accounts, also satellite accounts for tourism and communication. Its GDP calculation is also provided at quarterly basis. Present base year of the National Accounts is 2016-17.

12.1.3.3. TANZANIA

Tanzania is one of the countries which came into being during the sixties of the foregone century after gaining independence from colonial rulership. For Tanzania Mainland, formerly Tanganyika, British rule ended in 1961. In 1962, it became a democratic republic. In 1963 it was unified with Zanzibar, which had become independent then. The new country was named the United Republic of Tanzania («Tan» comes from Tanganyika and «Zan» from Zanzibar). But still, the distinction between Mainland and Zanzibar has been maintained in the statistical set-up of official statistics and in the National Accounts. Tanzania’s National Accounts are still separately compiled for Mainland (by the National Bureau of Statistics, NBS) and for Zanzibar (by the Office of the Chief Government

(101) adopted by the African Ministers for economic planning and development in 1990, https://www.uneca.org/sites/default/files/PublicationFiles/stat_rrsfdocument_final.pdf
 (102) released in 2006 by AUC, UNECA, PARIS21 and the World Bank, <https://www.uneca.org/publications/reference-regional-strategic-framework-statistical-capacity-building-africa>
 (103) Strategy for the Harmonization of Statistics in Africa (SHaSA), <https://au.int/en/ea/statistics/shasa>
 (104) Statistical Commission for Africa, the continental arm of the Statistical Commission at the United Nations.

(105) https://au.int/sites/default/files/documents/34580-doc-34577-doc-shasa_ii_strategy_eng_full_web.pdf
 (106) Adopted by the 12th Ordinary Session of the Assembly of Heads of State and Government of the African Union held in Addis Ababa, Ethiopia, on 3rd February 2009

Statistician Zanzibar). This is only possible because both statistical offices ensure that the statistical sources and data, the concepts and the methods are exactly the same and because the great geographical distance between the islands of Zanzibar (and Pemba) and Tanzania Mainland allows properly bifurcated statistical observation of Tanzania's economic activity, including even deliveries of goods and services between Mainland and Zanzibar.

The NBS is responsible for compiling the results for whole Tanzania and to report them to the international data bases but its main publication on National Accounts¹⁰⁷ is confined to Mainland, exclusively. Ditto, its Regional Accounts are confined to the 22 regions of TZ Mainland.

12.1.3.4. SOUTH SUDAN

South Sudan became an independent state in July 2011. With extensive support from donors and as part of the National Strategy for the Development of Statistics, the National Bureau of Statistics (NBS) of South Sudan developed a method for GDP calculation which used an expenditure approach, mainly based on household surveys and with the benchmark year 2009. Exports and imports data have been taken from the balance of payments produced by the central bank. Given the scarcity of source data for the production side of GDP, the NBS made extensive use of estimates and fixed ratios. In addition, in absence of relevant price indexes, the constant price estimates are almost fully based on CPI data.

In 2013, the NBS published GDP by expenditure for the years 2008–12 at current prices and, for the first time, at constant prices in October 2012. In May 2013, the estimates were extended to include 2012 for the purposes of the government budget. For 2010, a Swedish expert has developed a SUT.

Since reference year 2017, the GDP calculation from the expenditure side is the only approach to GDP calculation. Due to lack of reliable data, the GDP calculation from the production side has stopped after releasing 2016 because especially in 2015 and 2016, the figures for both independent approaches to GDP had evidenced a huge and widening gap between them.

In 2019 and for the reference year 2018, the NBS has conducted a Business Establishment Survey by economic activity (private non-agricultural), allowing the new country to have an evidence-based picture of the structure of its economy which goes beyond the production of oil (for the treatment of the oil pipeline to Khartoum see

section 9.9). The list frame for the survey captured roughly 13,000 establishments, the sample being roughly 5,000 out of them. Presently, the results are under scrutiny. It is hoped that they will allow South Sudan to revamp its GDP calculation with 2018 as the new base year.

12.2. Changes SNA 2008 over SNA 1993

12.2.1. Preliminary remarks

The System of National Accounts 2008 is number four in a series of methodological guidelines developed for National Accounts after the Second World War. Presently, all countries world-wide are implementing it or have already widely done so. For most of them, it is a migration from the preceding version (SNA 1993) while for some countries, including several African ones, the launching of the SNA 2008 includes incorporating also some changes which had already been recommended in the SNA 1993 but could not be materialized by them so far.

But even for those countries already versatile with the compilation of GDP and other main aggregates of National Accounts according to SNA 1993, it is a challenge to cope with the launching of the SNA 2008. One of the reasons is that very few countries had been able to incorporate the full complexity of the SNA 1993 (most of them being OECD countries which means: developed ones). Now the countries are confronted with the task to move from one system which for most of them was incomplete to the more advanced variant of this system which, again, will also remain incomplete for most of them.

Unfortunately, but consequently, both versions, SNA 1993 as well as 2008, describe "the" system in its full complexity and leave it to the countries how far to implement it. And for good reasons, some countries choose different approaches than their neighbors, be it that they have a different set-up of statistical sources and resources, be it that they have different analytical interests and priorities or be it that they just have another tradition and philosophy of National Accounts. In Africa, for example, we have a community of countries which use a certain tool (ERETES) and orient their approaches to it while others follow their own patterns.

This chapter gives an overview of those changes of the SNA 2008 over 1993 which are considered to be relevant

for the African developing countries because they may have an impact on the level of GDP or on the overall statistical system.

This chapter tries to be more colloquial and simpler than the original source SNA, but it intends to keep all technical terms in exactly the wording of the SNA. It is confined to the so-called "real accounts" as it leaves aside aspects of financial accounting which usually is the task of the central banks. It also leaves aside the technical details about financial services which is presumably the most challenging issue of the youngest revision of the SNA. The treatment of financial services is separately tackled in annex 12.3.

The SNA itself explicitly explains 57 changes vis-à-vis the SNA 1993 in its "Annex 3: Changes from the 1993 System of National Accounts" on pages 581 ff. The following sections are only excerpts, leaving aside changes in the SNA 2008 which are considered less relevant for the developing countries. It follows the same order as the source (called sections B to F there) and it refers to the numbering of the changes made by the SNA itself in these sections (B.1, B.2 ... to F.1, ... , F.9).

12.2.2. Statistical units and institutional sectoring

Section B of the SNA Annex 3 deals with 10 of the 57 changes of SNA 2008 over 1993 which further specify statistical units and institutional sectors. Numbers B.1 to B.7 deal with the treatment of ancillary units, multiterritorial enterprises, special purpose entities, holding companies and head offices. These definitions and clarifications can only be materialized if the data sources provide the characteristics of the statistical units in quest. Thus, they are a typical case for the need that National Accountants take influence on the scope, variables and questionnaires of the economic surveys to be carried out in the country or on the variety of administrative data underlying the purpose. Business registers, if they exist, should be updated accordingly.

Overall, these changes are of minor relevance for most African countries, possibly with two exceptions:

- Branches of non-resident units (B.3) may be permanent affiliates of foreign donor organisations (unless they belong to UN or other international bodies) or of foreign companies. They are now part of the economy they are located in and their activities constitute GDP of the host

country. It is therefore recommended to initiate (if not already done) their inclusion in the respective national surveys.

- The residence of multiterritorial enterprises (B.4) has now been clarified which is relevant especially for the treatment of airlines, shipping agencies and the like.

Numbers B.8 and B.10 (subsectoring non-profit institutions and financial corporations sectors) are relevant for compilers of National Accounts who already apply a sophisticated sectoring of the economy. Number B.9 (definition of financial services enlarged) is dedicated to financial services other than FISIM and is relevant for countries where the provision of financial services is quite advanced.

12.2.3. Transactions on products

Section C of the SNA Annex 3 deals with 6 of the 57 changes of SNA 2008 over 1993 (C.1 to C.6) which further specify the scope of transactions on products. The most challenging one is C.2 (method for calculating FISIM) which is tackled in another annex of this paper. For short, the SNA now has refined the allocation of FISIM between users (lenders & borrowers) and is treating it either as intermediate consumption, final consumption or exports.

But all other five changes may also be relevant for most of the African countries:

- Research and development is not an ancillary activity any more as it was the case in the SNA 1993 (C.1). It means that expenditures for this purpose are treated now as capital formation (either purchased or produced on own account) and not as intermediate consumption anymore. Because of it, the GDP would increase accordingly. It should be noted that R&D in the sense of the SNA does not include the increase of human capital.

It is also worth noting that this new paradigm does not only hold for R&D of private producers but also for government units, universities and non-profit institutions. It means that consequently the asset boundary had to be extended accordingly.

This is one of the substantial changes of the SNA 2008, but its implementation presupposes that the data sources provide the necessary details. Again: National Accountants must lobby for the adjustment and extension of their surveys and secondary data sources in their respective country.

(107) National Bureau of Statistics, The United Republic of Tanzania, National Accounts Statistics for Tanzania Mainland 2012 – 2018, First Edition in the revised GDP series base year 2015.

- The clarification of the output of the central bank (C.3) became necessary as central banks may have different roles at the same time: executing the monetary policy of the country, supervising and serving the financial corporations and in some cases even performing financial intermediation on their own.

The 2008 now clarifies that the non-market activities (monetary policy and supervision of the banks) are to be regarded as acquisition of collective services by general government with a matching transfer from the central bank to the government, so there is no net cost to the government for these services. Because of this imputed transfer all collective consumption remains with the general government sector. The imputed transfer is necessary as, by definition (SNA 4.104), the central banks are part of the financial corporation sector and thus do not belong to general government. For more details see also section 12.3.5.

- The recording of the output of non-life insurance services (C.4) had to be improved in the aftermath of dealing with the terroristic attacks of September 11, 2001. The output of insurance services as calculated using the 1993 SNA algorithm depended on the balance of premiums and claims. Output could therefore be extremely volatile (even negative) following major catastrophes, and this volatility impacts on GDP and balance of payments (reinsurance). The objective of the review was to be more consistent with the perception of production in this activity. This necessarily involves considering the treatment of reinsurance also. In particular, medium to long-term aspects of non-life insurance are now to be taken into consideration.

The output of non-life insurance is now calculated by:

- total premiums earned
- plus premium supplements
- less adjusted claims incurred.

The appropriate level of claims used in calculating output is called “adjusted claims” and these can be determined in two ways. The expectation method estimates the level of adjusted claims from a model based on the past pattern of claims payable by the corporation. The second method uses accounting information: adjusted claims are derived ex post as actual claims incurred plus the change in equalisation provisions, i.e. the funds set aside to meet unexpectedly large claims.

- Reinsurance is now similarly treated as direct insurance (C.5). There is no big reinsurance company in Africa, but the direct insurers usually operate with involving reinsurers

and thus this new method may have some relevance for African countries, also, albeit with low impact on the results.

- The valuation of the own final use by households and corporations has now to include a return to capital (C.6). Own final use can either be own capital formation of households or corporations or it can be own final consumption (in this case only of households). Own capital formation of households may result in owner-occupied dwellings or in any other assets used in production of unincorporated enterprises of households. Own capital formation of corporations may result in construction work or machinery and equipment (or the major repair of it) carried out with own resources. Own final use of households may mainly be auto-consumption of farm households and the like.

According to SNA 6.124 f., the valuation of own final use should be made by applying comparable market prices. When such market prices cannot be obtained then a second-best procedure is to be used which is the estimate of the sum of cost. The amendment of the SNA 2008 is that this sum shall not only comprise intermediate consumption, compensation of employees, consumption of fixed capital and certain taxes (less subsidies) on production but also a net return on capital. The SNA does not give further explanation about how to estimate this return. But for the estimate of the output of owner-occupied dwellings, the inclusion of a return to capital may have a significant impact.

12.2.4. Assets, capital formation and consumption of fixed capital

Section D of the SNA Annex 3 deals with 17 of the 57 changes of SNA 2008 over 1993 which extend and further specify the concepts of assets, capital formation and consumption of fixed capital. Change D.1 describes a shift of paradigm: the timing of transactions in goods, services or financial assets depends on the change of ownership. SNA 2008 now clarifies that this ownership shall be understood in an economic rather than in a jurisdictional sense. It now enhances the word “economic” and speaks of the principle of economic ownership, instead. This is a very sophisticated clarification and can for most of the African countries be seen as irrelevant.

Change D.2 describes the extension of the asset boundary to include R & D which is now to be subsumed under

“intellectual property products”. Change D.15 explains the rewording and restructuring of this kind of assets and its new structure.

Research and development is not an ancillary activity anymore as it was the case in the old version of the SNA. SNA 2008 recognises expenditures for both purchased and own-account R&D as fixed investment and the depreciation of these assets as consumption of fixed capital. This includes government R&D expenditure either protected via patents or made freely available to the public.

It should be noted that R&D in the sense of the SNA does not include the increase of human capital. R&D that does not provide an economic benefit to its owner (unsuccessful R&D) does not constitute a fixed asset and should be treated as intermediate consumption. It is also worth noting that this new paradigm does not only hold for R&D of private producers but also for government units, universities and non-profit institutions. Consequently, the asset boundary had to be extended accordingly.

The newly recognised output and “intangible” fixed assets are difficult to measure. In theory, the value of the output of R&D is equal to the value of discounted future benefits a corporation gets from their R&D investment. The 2008 SNA recommends that the output of research and development should be valued at market prices if purchased (outsourced) or at the sum of total production costs plus an appropriate mark-up representing the costs of fixed assets used in production if undertaken on own account. Research and development undertaken by specialized commercial research laboratories or institutes is valued by receipts from sales, contracts, commissions, fees, etc. in the usual way. As most R&D is produced on own account, the sum of cost approach for valuation of output will usually be applied.

The SNA recommends that a separate establishment should be distinguished for research and development when possible.

Change D.3 gives an overview of the whole classification of assets in its revised version. It is highly recommended that in economic surveys the countries switch to this classification when designing their questionnaires for expenses on capital formation and its production on own account. But it is also important that Government Finance Statistics report properly about such expenditures as R&D is also an important issue for General Government.

Change D.4 deals with expenditures on weapons system and needs special attention as it may have a huge

impact on GDP and as figures about weaponry are highly politically sensitive. It may even be that the government will not reveal the figures to the statisticians in the detail they are needed to materialize this change of the SNA. In former times it has always been argued that the capital stock of a country should comprise physical assets which are used for the production of goods and services and not for the demolition of them. Now the SNA has adopted the counterargument that weaponry also produces something: security or, at least, deterrence. It recommends that military weapons systems should be classified as fixed assets and that the classification of military weapons systems as fixed assets should be based on the same criteria as for other fixed assets; that is, produced assets that are themselves used repeatedly, or continuously, in processes of production for more than one year. Moreover, single-use items, such as ammunition, missiles, rockets, bombs, etc., delivered by weapons or weapons systems are to be treated as military inventories.

The 1993 SNA had treated as gross fixed capital formation only those expenditures by the military on fixed assets of a kind that could be used for civilian purposes of production, e.g. trucks or military barracks. On the other hand, military weapons, and vehicles and equipment whose sole purpose was to launch or deliver such weapons, were not treated as gross fixed capital formation but as intermediate consumption. If the countries will get the respective figures and implement this in their GDP compilation, they will create a shift from collective consumption to capital formation. Formerly most military expenses constituted intermediate consumption and consequently collective consumption. Now these expenditures are either gross fixed capital formation or changes in inventories, instead. But the “capitalization” of the weaponry implies that consumption of such fixed capital must be estimated and must be included in the (additive) calculation of government output. Hence, GDP will increase and GDP viewed from the expenditure side will change its structure.

Changes D.5 and D.6 do not need further explanation. For most African countries they are almost irrelevant even if the necessary source data can be obtained.

Change D.7 deals with a theoretical concept (capital services) which in the new SNA has been awarded a separate chapter (20). It provides a nontechnical introduction to the subject of capital services and the link to gross operating surplus. It may be relevant for sophisticated economic analyses, but most African countries will for the time being disregard it.

Change D.8 clarified how costs of ownership transfer (payments to lawyers, transport costs separately invoiced etc.) should be written off over the years as consumption of fixed capital. Moreover, it clarified that terminal costs should also be captured under “cost of ownership transfer” and thus should also be written off as consumption of fixed capital. Decommissioning costs (also known as termination costs) are costs occurring at the end of an asset’s life, ensuring that there are no unwanted legacy costs such as environmental damage or safety concerns. The possibility of very large decommissioning costs for capital assets such as nuclear power stations was not considered in the old versions of SNA and ESA, and so no guidance was given beyond general guidance on how to treat costs of ownership transfer on the disposal of assets.

Such termination costs are recorded, at the end of the asset’s life, as gross fixed capital formation under costs of ownership transfer. In SNA 2008 and in ESA2010, the initial capital formation consists only of the asset value and ownership transfer costs recognised at acquisition (not the decommissioning cost). This initial capital formation is then depreciated over the economic life of the asset allowing for the decommissioning costs as well as the normal wear and tear and obsolescence of the asset. At the time of decommissioning, additional capital formation is then recorded to reflect the decommissioning costs. At the same time, these decommissioning costs are written off by consumption of fixed capital which matches the decommissioning which has been anticipated in the estimate of capital consumption observed during the life of the asset plus any remaining decommissioning costs not covered in this anticipated capital consumption. The consumption of fixed capital of the unanticipated decommissioning costs is shown in the year of decommissioning, whereas the consumption of fixed capital of anticipated decommissioning costs is included in the annual estimates of consumption of fixed capital over the life of the asset.

The SNA gives the example of dismantling costs but especially for the mining countries in Africa, the recultivation of mines after their depletion could also be an issue in this regard.

Change D.9 deals with mineral exploration and therefore at first glance seems to be relevant for those African countries where mining is an important industry. But it is just a clarification that this position shall subsume evaluation also: the full wording is now “mineral exploration and evaluation”. Moreover, the SNA now clarifies aspects

of valuation and recording of payments. Thus, at the second glance the changes made in the SNA on mineral exploration are not substantial. However, the SNA emphasizes that the act of exploring for mineral resources (to be added: whether successful or not) is to be treated as a produced asset (which means to be captured as GFCF) while the minerals themselves are non-produced assets and thus do not constitute GFCF). The proper capturing of mineral exploration as such may indeed be an issue in the mining countries of Africa.

The solution found for the extraction of minerals (for short: exploration creates GFCF while the extracted minerals do not) shall now be applied to water resources, also (change D.12). The SNA does not give further guidance how to materialize this.

Change D.10 confirms that land improvements constitute fixed assets and GFCF while land itself is a non-produced asset and its purchase does not constitute GFCF. But now in the balance sheets (which only few countries in the world will compile) land itself and land improvements are to be shown separately (which was not the case in the old system).

Ditto change D.11 is of low relevance for the African countries. The “purchased goodwill” (SNA 1993) has now been renamed to “purchased good will and marketing assets” in order to reflect better what is meant with it. But it remains a non-produced asset and thus falls outside the boundary of GFCF. It is, anyway, an asset which is mainly relevant for the developed countries.

D.14 (cultivated biological resources), D.16 (concept of resource lease for natural resources introduced) and D.17 (changes in the items appearing in the other changes in the volume of assets account introduced) are dealing with non-produced assets which fall outside the boundary of the usual economic surveys dealing with the formation of produced capital captured in the capital accounts of the National Accounts.

To sum up: for most African countries it is relevant to launch the new asset classification in its economic surveys. But only the recognition of R&D as GFCF under certain circumstances and the treatment of weaponry are changes which may substantially affect the National Accounts of most African countries. All other changes are less irrelevant.

12.2.5. Transactions concerning government and the public sector

Section F of the SNA Annex 3 deals with 9 of the 57 changes of SNA 2008 over 1993. Change F.1 is not a change as such but the provision of a decision tree to help allocating the statistical units in quest. This decision tree (figure 4.1 on page 64 of the SNA 2008) is indeed useful for that purpose and it is recommended to make use of it. Change F.2 provides a guideline for treating restructuring agencies which was missing in the old SNA.

Change F.3 clarifies one of the borderline cases between fees and taxes: The 2008 SNA recommends that if a permit issued by the government does not involve the use of an underlying government owned asset, then the payment for the licence is a tax. The SNA does not give an example but licences for telecommunication activities may fall under this rubrum. It should, however, be noted that in many cases payments to the government are neither fee nor tax but just a payment for a service, e.g. building licence fees. SNA 22.89b: “The payment is recorded as a purchase of a service when, for instance, issuing the licence or permit implies a proper regulatory function of the government by exercising control on the activity, checking the competence or qualifications of the persons concerned”.

Change F.4 clarifies that exceptional payments from public corporations should not be recorded as distribution of entrepreneurial income anymore but as withdrawal from equity (if made from accumulated reserves or sales of assets). Withdrawal of equity falls under financial transactions. Thus, net lending / net borrowing of the government sector would not be affected any more by such exceptional payments.

Change F.5 clarifies that exceptional payments from government to public quasi-corporations to cover accumulated losses should be treated as capital transfers (as it is already the case for such payments to public corporations). In this context it should be noted that the regular coverage of persistent losses for the sake of economic or social policy is to be treated as a subsidy on products (SNA 7.105c).

Change F.6 confirms that the recording of tax revenues should be done on accrual basis and not on cash basis and gives some clarifications in detail. But it also emphasizes that the accrual principle must not be misinterpreted in

the sense that taxes are included which are unlikely to be collected at all. Accrual means that taxes are recorded when they become due while cash basis means to select the time of encashment for the recording.

Change F.7 clarifies the treatment of tax credits. Tax credit is a special form of tax relief. It is an amount which is deducted from the tax after it has been computed. The 1993 SNA did not give guidance on the treatment of tax credits. The 2008 SNA recommends that the payable credits should be recorded on a gross basis.

Change F.8 gives guidance to the treatment of ownership of fixed assets created through public-private partnerships. This guidance was missing in the old SNA.

Change F.9 takes up what in the old system was perceived as inconsistent: holding gains were, and still are, excluded from the SNA definition of income but taxes on the holding gains were recorded as current taxes on income and wealth. The SNA now recommends showing this kind of direct taxes as a separate category where possible and relevant.

To sum up: for some African countries the clarification on exceptional payments may be relevant if such payments occur. All other changes of section F of SNA Annex 3 are of minor importance. But the provision of the decision tree for the allocation of units of the government or of semi-governments should be utilized for a review of the country’s sectorization of its National Accounts.

12.2.6. Harmonization between SNA and Balance of Payments Manual

Section G of the SNA Annex 3 deals with 4 of the 57 changes of SNA 2008 over 1993. The changes listed under section G clarify the treatment of special cases like treatment of goods sent abroad for processing (G3) or merchandising (G.4).

In the old system, the treatment of goods sent abroad for processing without change of ownership had blown up exports and imports. Such goods were shown as exports when sent abroad, and then, on return from abroad, recorded as imports at a higher value as a result of the processing. This was known as the gross recording method, where a change of ownership was imputed, and international merchandise trade figures represented an estimate of the value of the goods being traded.

Now, the 2008 SNA and BPM6 do not impute a change of ownership anymore, but rather show only one entry – an import of the processing service. This would be an export of the service for the country in which the processing takes place. This recording is more consistent with the institutional records and associated financial transactions. It does however cause an inconsistency with the international merchandise trade statistics (IMTS). This will continue to show the gross value of the exports for processing and returning imported processed goods, as it is based on the physical movement of goods, rather than the economic ownership of the goods. Examples of processing in manufacturing services on physical inputs owned by others include oil refining and assembly of electronics.

The treatment of merchanting also intended to avoid an artificial blow-up of imports and exports. For short, merchanting means that goods from Country A are traded to country B by a trader in country C (without goods entering country C). In country C, this should now be recorded as negative exports on acquisition and positive exports on disposal. The difference between the two appears in exports of goods but appears as the production of a service in the merchant's economy, analogous to trade margins applied to domestically traded goods.

12.3. Financial services in the SNA 2008

12.3.1. Characteristics of Financial Services

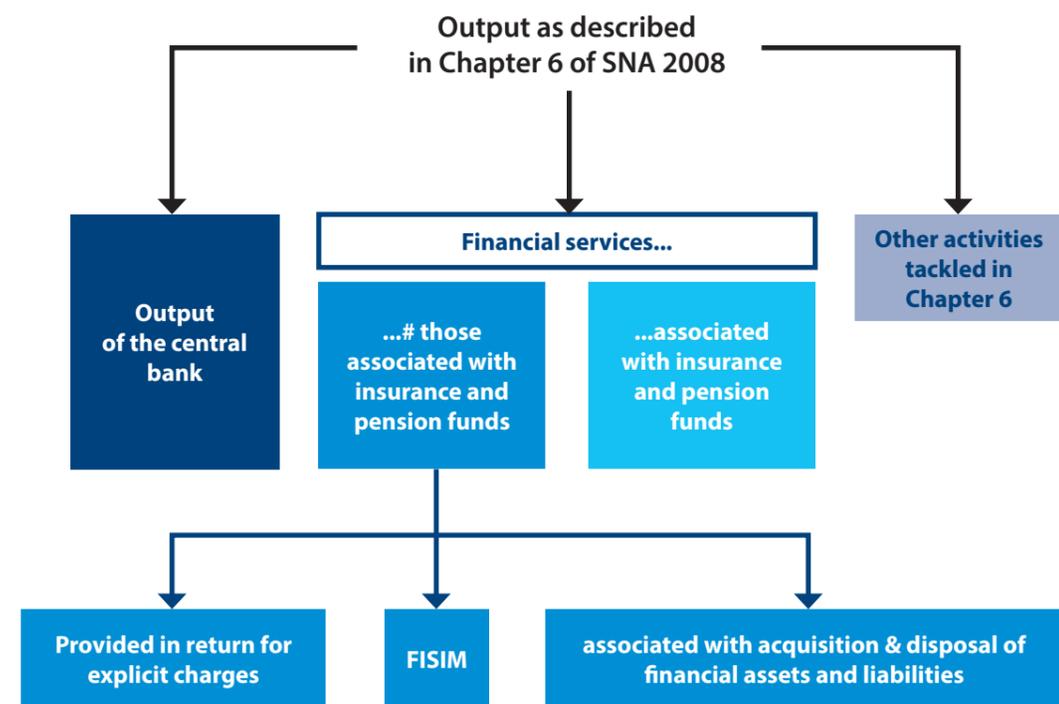
For some industries, the general rules of the SNA governing the recording and valuation of output are not sufficient to adequately determine how to do this. This is mostly the case for the so-called "margin industries"¹⁰⁸, such as banks, insurances, and trade.

Banks—in the more precise terminology of the SNA "financial institutions"¹⁰⁹—are mainly engaged in financial transactions. Financial transactions are recorded exclusively in the financial account, which records changes in financial assets and liabilities. Thus, from the overall SNA concept, financial transactions do not have direct impact on value added, income balances, savings, or fixed capital formation.

Nevertheless, financial institutions provide services related to the financial transactions. These services and the respective distributive transactions, plus the capital formation related to them, must be recorded in the "real accounts" such as production, generation, and use of income and capital account. Two main questions arise: How to measure these services? How to determine who is consuming these services?

Since World War II, an internationally agreed upon "System" of National Accounts has been in place, the markets and instruments for dealing with financial assets have changed drastically. SNA revisions regularly must cope with that. In the 2008 SNA revision, measurement of financial services, the subject of in-depth review, is further detailed and substantively revised compared to SNA 1993. Views of how to deal with financial services have also changed between the subsequent versions of the SNA. The SNA 2008 reflects the latest developments in financial instruments and the latest views on how to deal with them.

According to SNA 2008, financial corporations exclusively carry out financial intermediation. Moreover, the SNA 2008 fully describes all activities that financial corporation may carry out as a primary activity, financial intermediation (FISIM) being just one of them. On output, the structure is determined as follows:



This annex is confined to financial services not associated with insurance and pension funds and tackles all sub-categories one by one below. However, most of the weight is given to FISIM, the most complicated and most relevant kind of the financial services. We consider the output of central bank services briefly at the end of this annex.

Financial corporations consist of all resident corporations principally engaged in providing financial services, including insurance and pension fund services, to other institutional units. Because the provision of financial services is typically subject to strict regulation, usually financial services providers do not produce other goods and services, and financial services are not provided as secondary production. To put it simply, banks usually do not have activities other than banking, and non-banks usually do not have any banking activity. The homogeneity of production is also mostly true for financial auxiliaries such as stock exchange companies, brokers, forex offices, or even street money changers.

12.3.2. Financial Services other than FISIM

Financial services may be paid for explicitly or implicitly or both. Financial services clients directly pay for may be provided by different categories of financial institutions: deposit taking institutions, such as banks, may charge households to arrange a mortgage, manage an investment portfolio, among other things; while specialized financial institutions may charge non-financial corporations to arrange a flotation of shares or to administer a restructuring of a group of corporations.

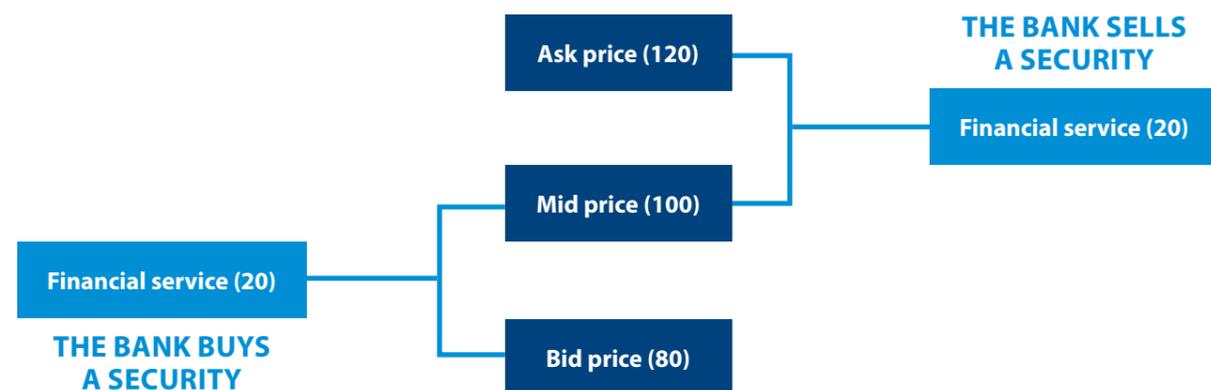
Most probably, the largest direct fee charged is the fee credit card issuers charge to units that accept the cards as a means of payment. The charge is usually calculated as a percentage of the sale, or to a card holder who may also be charged a usually annual fee for holding the card. The fees constitute output of financial institutions.

(108) The name indicates that the output is measured by a margin between the revenues and certain outlays rather than mainly by the revenues themselves. In case of trade, these outlays are purchases of goods to be sold. In case of insurances, the margin is premium less claims. And in case of banks, it is revenues from interest received minus interest paid.

(109) The SNA 2008 often uses the term "financial institution" which is a pure synonym for "financial corporation".

Another bundle of financial services deal with securities and foreign exchange. In practice, almost all such transactions are carried out via financial corporations. In both cases, securities and foreign exchange, a bid price and an ask price are quoted. The first is the price the potential buyer is to pay, and the second is the price that the owner receives on sale. This activity is called market making and may be undertaken by specialized financial corporations or financial corporations providing a wide range of financial services.

By buying and selling at different rates, the financial corporations arbitrage and therefore, unlike brokers, take risks. Holding gains/losses are excluded. The "margins" mentioned in this section must not be confused with the margins making up "FISIM", which is tackled separately below.



The rationale of the SNA 2008 for measuring this service is very simple. SNA proposes application of a mid-price, which, by convention, is the average of bid-price and ask-price. The difference between the bid price and the mid-price is a margin paid by the buyer to the financial corporation, and the difference between mid-price and the ask price is a margin paid by the seller. The bid-ask spread is remuneration for the financial service provided by the bank, irrespective of whether the securities are traded on own account or on behalf of clients.

12.3.3. Financial Intermediation Services Indirectly Measured (FISIM)

The problem of defining and measuring of banks' output has existed since the beginning of the National Accounts. Different solutions in subsequent SNA revisions have been built around the following axioms:

- Lending money does not fall within the GDP production boundary as it does not constitute a product or a service. Remuneration for lending money (mainly interest) is booked as income from property.

- Income from property is to be recorded as distributed income. It must not be double counted.

- However, lending money often is supported by services rendered by banks or similar institutions, often referred to as financial intermediation. It is to be included when calculating GDP.

- Remuneration for financial intermediation can only be measured indirectly by imputing a service charge on account of bank clients.

In all four versions of the System of National Accounts (1953, 1968, 1993, and 2008), the basic idea is the same though the term "financial intermediation services indirectly measured" and the acronym "FISIM" is used only in the 1993 and 2008 versions.

Financial institutions borrow funds and then lend at different terms to others, transforming the funds in ways more suitable to borrowers. They do not charge their clients explicitly for most services but do so implicitly by charging an interest on lent funds. The interest rates they receive are generally higher than rates they pay to lenders. The interest margin is not considered as sale but rather an implicit payment for banking services. It represents charges for financial intermediation services indirectly measured (FISIM).

Applying this rationale is not straightforward. Puzzled users of National Accounts might ask whether the analytical benefit of such a sophisticated method is worth the effort needed to understand and apply it. In response, NA users should keep in mind that bank output is limited to the value of services they directly charge for, their operating surplus, or even their value added, would be negative because the charged services often do not even cover intermediate consumption. Negative bank contribution to GDP would be even more confusing than any complexity arising from constructing FISIM.

The recommendations in subsequent SNA revisions differ in their answers to five main questions:

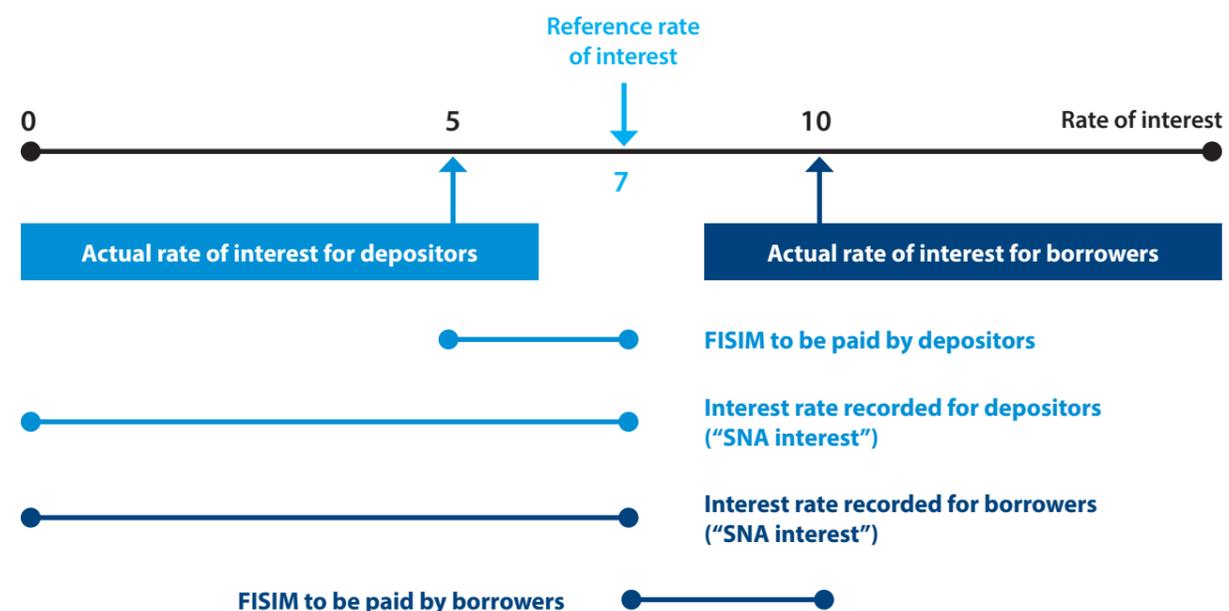
- Is production of FISIM confined to financial institutions or not?
- Is FISIM confined exclusively to borrowed funds?
- Is FISIM confined to specific financial assets or liabilities?
- How should FISIM be measured?
- Who is consuming FISIM?

The method preferably recommended in SNA 1993, with some modifications in SNA 2008, consists in calculating so-called reference rates, which are then applied to loans and deposits of various sectors. The idea is that bank services are consumed by lenders as well as by borrowers.

FISIM would be recorded under imports when resident borrowers or lenders use foreign bank services. This affects GDP when FISIM gets part of final consumption or export or import. The value added of the industries (branches) also depends on FISIM because it constitutes intermediate consumption.

The scheme below presents this in more general terms. It also shows that the option to calculate FISIM affects recording of interest in the allocation of primary income account. Interest is recorded using the reference rate as yardstick for it. Lenders "get" more than actually paid, and out of this virtual increase of income they virtually pay for their consumption of FISIM. Borrowers "give" less than they actually pay. Thus, they also have a virtual increase of income they use to virtually pay for consumption of FISIM. After all, saving of lenders and borrowers will be exactly the same as compared to the variant of "no allocation". For ease of understanding, SNA 2008 employs the terms "SNA interest", which is the one recorded as property income in National Accounts based on application of the reference rate, and "bank interest", which is the actual payment of clients make to their banks or vice versa.

FISIM and the reference rate of interest



FISIM on the assets of the bank is interest actually received minus interest when applying the reference rate. FISIM on bank liabilities is interest when applying the reference rate minus interest actually paid. In simpler words, total FISIM is the sum of bank interest on loans minus SNA interest on the same loans, plus SNA interest on deposits less the bank interest on the same deposits.

This more ambitious option of compiling FISIM recommended by the SNA 1993, and mandatory in SNA 2008, presupposes good banking statistics. The cornerstone of this approach is determination of the reference rate. According to SNA 2008, the reference rate should represent a risk-free rate of interest for inter-bank borrowing and lending. However, different reference rates may be needed for each currency in which loans and deposits are denominated.

For domestic inter-bank activities, FISIM might be neglected as there is almost no service. The exclusion of cross border interbank transaction from FISIM is new in SNA 2008.

Using the reference rate as determined above, we obtain net allocation of FISIM of operations between resident financial institutions, between residents and non-residents, and between the main resident institutional sectors. It is necessary to detail the calculations related to non-financial residents. Moreover, it is necessary to identify the share of the service allocated to households by distinguishing what is consumed by unincorporated enterprises within households (intermediate consumption) and private households in their capacity as consumers (private consumption). The distinction between intermediate and final use has implication for GDP calculation.

For FISIM imports, we may apply specific reference rates for every country. But for simplicity we may use the same reference rate as for resident financial institutions. We can justify this by saying that the non-resident financial institutions adapt themselves to the domestic market.

According to the updated definition in the SNA 2008 revision, FISIM is “the difference between the rate paid to banks by borrowers and the reference rate plus the difference between the reference rate and the rate actually paid to depositors”.

FISIM calculation is summarized here step-by-step:

- We calculate FISIM according to a reference rate, confined on the asset side of the banks to loans (in SNA-code AF.4) and on the liability side to transferable deposits (AF.22) and other deposits (AF.29).
- We make use of banking statistics.
- We must ask experts for a suitable reference rate. It should be the annual average, preferably of three-month period loans / deposits.
- We take stock of relevant assets at the beginning and end of the period and calculate the **average of the loans**.
- We get **“SNA-interest” on loans** by multiplying the reference rate with the average stock of loans.
- We take stock of relevant liabilities at the beginning and end of the period and calculate the average of **deposits**.
- We get **“SNA-interest” on deposits** by multiplying the reference rate by the average stock of deposits.
- Now we need the **actual interest on loans and deposits**. However, these figures are not separately available as bank profit and loss accounts merge all interest payments. Thus, we apply a model and get “actual interest” by multiplying the average stock of loans and deposits with weighted averages of the respective interest rates.
- Now we can get **FISIM on loans** by subtracting SNA-interest on loans from actual interest on loans.
- Accordingly, we get **FISIM on deposits** by subtracting actual interest on deposits from SNA-interest on deposits.
- We finally must **distribute FISIM** on loans as well as FISIM on deposits to intermediate and to final users as per classification of loans and of deposits, respectively. Final users include the rest of the world.

Finally, in National Accounts, all financial services produced in the country must be recorded as final or intermediate consumption of other domestic units or of the rest of the world (exports). Also, financial services can be imported. As a makeshift, we can apply keys developed from the structure of bank clients. For FISIM, we can utilize Central Bank figures about loans and deposits by clients. The allocation of FISIM to users should be done separately for depositors and for borrowers. The figures for FISIM imports must be requested from the Central Bank.

12.3.4. Constant price estimates

With regard to eliminating inflation and calculating figures at constant prices, the output of financial services consists of two main components: (i) financial services directly charged by financial corporations to their clients, and (ii) financial intermediation services indirectly measured (FISIM).

As direct financial services, such as those attached to activities related to currency exchange and financial advisory services, among others, are charged explicitly, prices simply equal the actual fees or commissions charged for providing the services.

But the issue becomes more difficult when it comes to FISIM. Ideally, we should have a price index that reflects the definition of the margin measure of FISIM. But it is a serious challenge as a “margin” cannot have a price. There are no directly observable price or quantity units that actually represent the FISIM output. This causes major conceptual and practical problems regarding FISIM price and volume measurement and would therefore have to be based on conventions.

SNA 1968 and 1993 gave no explicit recommendation in that regard. SNA 2008 (par. 15.104) recommends at least a makeshift solution: In the model for calculating FISIM for the current period, we simply replace interest rates with those of the base year and apply them to the real values of corresponding assets and liabilities.

Below the line, we calculate the volume of FISIM output by deflating the total of loans and deposits by, for example, CPI and apply the pattern of interest rates of the base year. Mathematically, this means that the FISIM growth rate in real terms equals the growth rate of deflated deposits and loans.

12.3.5. Output of central banks

Central Banks play a wider role than the banks in charge of financial intermediation. Their main functions consist in formulating and implementing monetary policy, emitting and replacing bank notes, supplying centralized banking services, and managing national debt. The relationship between the state and the central bank is different from the relationship between the state and other financial institutions. As implemented in the SNA 2008, we distinguish between three broad groups of central bank services:

- Either central banks are predominantly involved in financial intermediation. These services are individual in nature, and in the absence of policy intervention in the interest rates charged by central banks, would be treated as market production.

- Or central banks are predominantly involved in regulatory tasks like monetary policy services. Monetary policy services are collective in nature, serving the community as a whole, and thus represent non-market output.

- Or central banks are involved in both market and non-market production. Borderline cases, such as supervisory services, may be classified as market or non-market services depending on whether explicit fees are charged to cover the costs of providing the services

In case that central banks are mainly involved in financial intermediation, calculation of output is, in principle, conducted the same way as for commercial banks. In case of monetary policy services (non-market output), we proceed as if we were compiling output of public administration of general government by assuming that net operating surplus is zero and we add employee compensation, consumption of fixed capital, and intermediate consumption. In short, we add the costs (“administrative cost approach”).

For the case of non-market output, we must solve a problem: Financial corporations produce this output, but its use it is recorded as collective consumption, which by definition of the SNA can only be expenditure by “general government” sector. Thus, according to the recording of National Accounts, general government virtually purchases this output from the central bank. To counterbalance this imputed purchase, we also record a current transfer in same amount (also a virtual one) in the opposite direction, from central bank to general government. With this, it is ensured that neither for general government nor for the central bank, the balancing items saving and net lending are affected.

12.3.6. Treatment of capital gains, bad debts and property incomes

National Accounts and commercial bookkeeping differ in a lot of aspects. Three of them are highly relevant for compiling output and value added of financial corporations:

- Capital gains or losses – in SNA-language called holding gains or losses – often are related to financial assets. Commercial bookkeeping usually captures them in the profit and loss account to an extent which depends on national practices and rules for that. In National Accounts holding gains neither constitute output nor value added nor operating surplus as they do not stem from production or from transactions with other institutional units. They do not even fall under property income. If the SNA in its full complexity would be applied, they would be recorded in the revaluation account, instead, regardless whether they are realized (for example by sale or redemption) or whether they are unrealized.
- Similarly, the writing-off of bad debts forms part of “cost” of the financial corporations but in National Accounts is to be excluded from intermediate consumption. It is to be recorded under “other changes in volume of assets”, instead. This is again an account compiled by only those countries which already are quite advanced in implementing the SNA 2008.
- Profit and loss accounts of banks prominently capture property incomes the banks receive or pay. The profit of a bank highly depends on its ability to widen the balance of property incomes paid minus received. From the micro-

perspective of a bank it is quite justified to record the profit like that. From the macro-perspective of National Accounts, however, we have to avoid double-counting and must neither include property income received in output nor property income paid in intermediate consumption. Property incomes like interest, dividends or rents on land form part of pure distribution of incomes. Interest or dividends which banks receive from producers have been integral part of the value added and the operating surplus of these producers, already. The rationale of the SNA's concept to exclude all property income except FISIM from calculating production and generation of income is that value added and operating surplus of the industries should be unaffected by the amount the producers are using own funds or borrowed funds (see also the example in the box below).

Example:

- *Amir and Besa own identical barber shops: same assets, same number of clients, same prices, same output, same intermediate consumption.*
- *Amir has paid his assets with a bank loan. Besa's shop is fully financed by himself.*
- *Commercial bookkeeping will conclude that Amir's profit is lower than that of Besa as it is squeezed by interest payments. In National Accounts, however, the interest payments (as far as it is “SNA interest”) are recorded under redistribution. Value added as well as operating surplus for both shops are almost the same. They only differ by the FISIM used by Amir. Consequently their “productivity” (value added per factor input of labour or of capital) is also almost the same.*

The differences between bank accounting and National Accounting can be summarized in a scheme as follows:

Transaction	Bank accounting	National Accounts	
Interest received	Proceeds (increase of profit)	“SNA interest” received (property income)	
Interest paid	Expenses / cost (decrease of profit)	Output of FISIM (production account)	
Writing off of bad debts		“SNA interest” paid (property income)	
Capital losses	Expenses / cost (decrease of profit)	Changes in assets (≠ real accounts)	Volume changes
Capital gains			Value changes
Capital gains	Proceeds (increase of profit)		

12.4. Unit value indices

As any other data on transactions in products, volume estimates for imports and for exports need an appropriate deflator. Many countries lack special primary price statistics for this.¹¹⁰ They, instead, use so-called unit value indices for this. Because of its simplicity, this method is the predominant one among the countries of the world (SNA 15.163). The idea is that for selected goods (in ideal case homogeneous ones which do not change their physical appearance over time) the values are divided by the respective quantities resulting in an average price per unit of quantity (the “unit value”). The time-series of the unit values is transformed into an index. The weight is taken from an appropriate base year (which should be a “normal” one and not too old), with the basket of the weighted goods only comprising those which have not been sorted out as “outliers”.

In principle, the compilation of a unit value index (UVI) out of the selected goods is like the compilation of the CPI. The compilation can be done in a simplistic manner in a spreadsheet in several steps as follows:

- The first stratum provides the figures for the values of exports (and imports, respectively) of the selected commodities in the rows and the years in the columns. One row shows the weight where the total of the selected goods is 100. The non-selected items are those where quantities are missing or meaningless.
- The second stratum provides the figures for the quantities of exports (and imports, respectively) of the selected commodities in the rows and the years in the columns.
- The third stratum provides the unit values for the exports (and imports, respectively). They are simply the result of dividing the values by the quantities and multiplying it with the currency exchange rate. The third stratum should be enhanced by columns giving mean, median and standard deviation of the unit values per commodity
- The fourth stratum erases some outliers. Each unit value (for this purpose tentatively deflated by the CPI) which in absolute terms deviated more than, say, 100% from the median of its time series (from figures also deflated by the CPI) has to be erased.

• The fifth stratum provides the unit value index components which means that the unit value of year t is divided by the one of the base year and then multiplied by its weight. If the weights are the ones of the base year, the index would be a Laspeyres type index. If the weights are those of the current year, the index would be a Paasche type one. Both variants are practiced. In Africa, chained UVIs are rarely used (South Africa, Cameroon, and Morocco).¹¹¹

- The total of the unit value index components should, in principle, add up to the total index. But for some commodities unit values may not be compiled for each year because either there were no exports, or imports respectively, or the figure had been erased after being identified as outlier. Thus, first the total weight of the commodities having values had to be measured. The index as such is then the result of raising the totals of the unit value index components by the missing commodities.
- The price changes over the previous year can now simply be calculated by dividing the subsequent indices.

Delineating a unit value index for exports of developing countries is straightforward as most of the exports are made up of homogeneous products such as agricultural products or oil which are quite in quality over time and their values and quantities allow for reliable average prices even over longer periods. The index is based on these goods assuming that the price changes over time of the remaining goods follow the same pattern.

Delineating a unit value index for imports of developing countries is not that straightforward for several reasons:

- Imports are much more diverse than the exports and thus need careful selections of goods which are homogeneous enough in quality over time so that they may hold as price representatives for a wider bundle of commodities.
- In merchandize trade statistics, some goods are combined under just one position (HS-code 99999999 called “other”).
- The main data source for merchandize trade statistics – the customs authorities – does not include exports and imports of electricity.
- In merchandize trade statistics, imports are valued cif which means that cost, insurance and freight for the imports are included in the values. In National Accounts exports as well as imports are to be recorded fob (free on board) in order to avoid double-counting. It is assumed that the changes in the prices over time were the same as those at fob values.

(110) In Africa, so far only Mauritius, Seychelles, Tanzania and Zimbabwe have been able to establish a special survey on prices of imports and exports. Source: presentation Henry Thurman during e-meeting STG Trade in September 2020.

(111) Source: presentation Henry Thurman during e-meeting STG Trade in September 2020.

Special attention should be given to the fact that in merchandize trade statistics the values are usually given in US currency. It needs transformation into local currency with the average¹¹² currency exchange rate for the respective year. Otherwise, important indicators such as the terms-of-trade effect will not be measured properly. The terms of trade are defined as the ratio between the index of export prices and the index of import prices.

It should be noted that the figures for exports and imports provided by the merchandize trade statistics are based on figures provided by the customs authorities. Thus, the unit values are those of commodities. Trade in international services (bank or insurance services, tourism services, software and other goods provided online) is not included.

As already indicated, the method of UVI calculation presented here is a simplistic one. In September 2020, the Special Technical Group on Trade under SHaSA held an e-meeting on harmonizing concepts, methods, and techniques for computing trade indices, organized by STATAFRIC. The guidelines and documents presented there will be made available on the special website of STATAFRIC which is under preparation. In a special subset of presentations, an expert provided a paper for compilation of UVIs, including the presentation of a software tool for compiling UVIs. Like the IMF's XLPBM, it is designed as

an add-in tool under EXCEL, written in visual basic. Its name is TIMXLS. It provides an interface to users to easily manage steps leading to the production of trade indices. A user guide will be made available by STATAFRIC on its upcoming website soon.

12.5. Schematic *SUT* in a numerical example

In a fictive economy with five industries and five products, the distribution of supply may be as in the supply table below, showing the supply of, for example, food products as an output of agriculture (10) and, if processed, of manufacturing, here food industry (12). Food in the form of ready-made meals may be provided by the government canteens (1) and the clinics, all at basic prices. The imports of food be 5, the trade margin be 8 (which is equal to the output of trade and, for short, is sales of traded goods minus purchases of goods for resale). The taxes on the food products, e.g. sales tax or VAT, may be 4. The total supply is 41 then.

Supply of ...	Output of industries					Imports	Margins (trade)	Taxes – subs. On products	Total supply
	Agric	Man.	Trade	Admin	Health				
Food	10	12	0	1	1	5	8	4	41
Machines	1	38	0	0	0	12	15	4	70
Trade	0	0	23	0	0	0	-23	0	0
Administration	0	0	0	14	0	0	0	0	14
Health care	1	1	0	2	26	1	0	0	31
All products	12	51	23	17	27	18	0	8	156

The supply of machines is mainly stemming from output of domestic manufacturing (38), partly (12) also from imports. Including trade margins and taxes on the products, the supply of machines is 70.

The output of administration represents the non-market output, valued by the total cost of its production, here being 14. As this output is neither traded nor transported nor taxed, the supply at purchasers' prices is also 14.

The output of health care is mainly made by the health industry (26), partly also by agriculture, manufacturing and administration, possibly by providing health checks to their employees. To a small extent (1), health services may also be imported, e.g. by treatment of residents in clinics abroad.

The output of trade needs special attention. As trade as such cannot be purchased, the trade output is allocated to the respective traded goods through the trade margins. For avoiding double-counting, the total of the trade margins are to be subtracted from the output of trade. Hence, the supply of trade services is zero.

It should be noted that the output of the industries is not confined to just one major product. The "make matrix"

(rows 2 to 6 and columns 2 to 6) shows that agriculture, for example, may also produce the already mentioned health services or machines (here, for example, the major repair of a harvesting machine).

The bottom row shows the totals of output, import, margins and taxes. The total for the margins must be zero because the distribution of the margins is just a zero-sum game. The margins for transports have been omitted here in order to keep the example simple.¹¹³

The supply table must have exactly the same rows and the same columns for the industries. But in the supply table, the figures in the columns for the industries are those of intermediate consumption, e.g. agriculture uses food items, possibly fodder, but also health care services (1). The row for "food" in this supply table shows that manufacturing (possibly the food industry) is using it for further processing, the administration (1) possibly for nutrition of soldiers, health (3) for meals for clinic patients, and trade (1), possibly for offering them to potential customers to stimulate their sales. But most of the supply of food is absorbed by household consumption (25). In this fictive economy, food is also exported (3).

Uses of ...	Intermediate consumption of industry					Final cons.		GCF	Export	Total use
	Agric	Man.	Trade	Admin	Health	hh	gov.			
Food	1	7	1	1	3	25	0	0	3	41
Machines	0	1	2	2	0	3	0	53	9	70
Trade	0	0	0	0	0	0	0	0	0	0
Administration	0	1	1	0	1	1	10	0	0	14
Health care	1	1	1	1	2	24	0	0	1	31
All products	2	10	5	4	6	53	10	53	13	156
GVA	10	41	18	13	21					
All inputs	12	51	23	17	27					

(112) SNA 2008: "In principle, the actual exchange rate applicable to each transaction should be used for currency conversion. The use of a daily average exchange rate for daily transactions usually provides a very good approximation. If daily rates cannot be applied, average rates for the shortest period should be used. ..."

(113) In case of transport services, however, there are also transports of other goods than the traded ones, e.g. construction materials, waste etc, and there are transports of passengers, also. Hence, the transport margins are also balanced with the output of the respective transport industry, but there will be a remainder for the output of transports.

Machines are mostly used for capital formation (53) and exports (9), to minor amounts (presumably small or less costly machines) for household consumption or for intermediate consumption. The row for the use of trade services shows zeros because the supply is also zero and because trade services as such are consumed in combination with the goods channelled through the trade industry. The non-market output of administration services is mainly consumed by the society at large (government final consumption expenditures), to a very small amount for private consumption or intermediate consumption of private producers, e.g. for visa fees or other services the government is charging the beneficiaries. The column for final consumption expenditures of the government must not have other entries than those from non-market output. Health services are mainly used by households (24).

The SUT for the fictive economy is balanced and consistent. This may be seen from the fact that for all products the uses equal the supply and that the totals of inputs of the industries in the use table are identical with the totals of the respective output in the supply table.

12.6. Purchasing Power Parities

National Accounts usually are compiled in the national currency. For two purposes, this needs further action: one is compiling results for groups of countries, e.g. the RECs in Africa or the whole continent, and the second is international comparisons of GDP or incomes by capita between countries. Hence, figures must be made commensurate by transposing them from national currency into a common one used for aggregation or comparison.¹¹⁴ In principle, it can be any currency, not necessarily one of the currencies under comparison or aggregation. Since decades of years, the official exchange rates from national currency into the US\$ are used as the common denominator, the respective procedure sometimes being called “dollarization”.¹¹⁵

But since long, the official exchange rates are more and more determined by pure financial transactions rather than by the cross-border transactions related to products

(imports and exports). And even if the currency exchange rate would be used, then it would be confined to the international trade of products (goods and services), they may not reflect price differences between countries for goods or services which are not traded at all, e.g. roads, houses, haircuts, meals or heart operations.

As an alternative, the compilation of Purchasing Power Parities (PPP) evolved. The idea is simple: A certain basket of goods, not necessarily consumer goods, is valued at each country in local currency, with the PPP being the parity either between two countries (binary approach) or vis-à-vis the basket of several countries (block approach) measured in the currency of one selected country, be it the United States or any other. The problem lies in the selection of a common and representative basket: the one in Thailand differs from the one in Kenya or in France. Such baskets can be defined for neighbouring countries, while for comparisons between remote countries it gets more complicated. For the method to achieve a global comparison, see SNA 15.221 (“ring comparison”).

It was the World Bank to take the initiative in 1968 to organize world-wide rounds of international price comparisons (ICP) for the development of the parities. On its website¹¹⁶, it explains the development:

“The ICP is a worldwide statistical initiative led by the World Bank under the auspices of the United Nations Statistical Commission, with the main objective of providing comparable price and volume measures of gross domestic product (GDP) and its expenditure aggregates among countries within and across regions. Through a partnership with international, regional, sub-regional and national agencies, the ICP collects and compares price data and GDP expenditures to estimate and publish purchasing power parities (PPPs) of the world’s economies.”

Preparing international price comparison involves many countries and is methodologically challenging and empirically cumbersome, hence costly and carried out in multi-annual intervals, only. The last two rounds of ICP were carried out for the years 2011 and 2017. For Africa, the responsibility was with the AfDB. Almost all African countries participated, and the time is ripe to make use of the results. In its so-called Pocket Book, the African Union published some results¹¹⁷, based on the 2011 round.

They again show the huge discrepancy between results from currency exchange rates and PPP: The share of Africa in the world’s GDP is only 2.8 % if based on currency exchange rates. If, instead, based on PPP, Africa’s share is 4.96 %. Africa’s comparative price level index vis-à-vis the United States is 35.5 with US being 100. This index reflects the ratio of the PPP to the official exchange rate (see also SNA 15.225).

The SNA (15.216) notices that “when using the GK method, PPP based expenditures are generally overstated for poor countries”.¹¹⁸ It could as well have stated it the other way around, namely that results based on the exchange rates are understated for the poor countries.

PPPs are valid for one year only (2017 the latest). For the years between the ICP rounds, the conversion is into the „international \$“: the parity to US\$ 2011 is annually adjusted with the GDP inflation rate of the US. The synonym for the international dollar is the Geary-Khamis dollar. SNA 15.232: “The method commonly used to extrapolate PPPs from their benchmark year to another year is to use the ratio of the national accounts deflators from each country compared with a numeraire country (generally the United States of America) to move each country’s PPPs forward from the benchmark.” ICP based growth rates of GDP may differ from national growth rates (see SNA 15.232 ff). PPP results are mainly used for conversion of the GDP to a common and commensurate currency. But PPP ratios are also calculated for private consumption, for actual individual consumption or for special product groups

The SNA describes the delineation of PPP and their utilization for the National Accounts in its chapter 15 in sub-chapter E (“International price and volume comparisons”). In its final paragraph (15.238), it concludes: “Despite the conceptual and empirical difficulties, PPP-based volumes provide a much firmer basis for international comparisons than the commonly used alternative of converting national accounts aggregates to a common currency using exchange rates.”

For simplicity, Purchasing Power Parities are often explained with a “Big-Mac Index”, a commodity which can be purchased all over the world. If McDonald’s Big Mac costs 100 Birr in Ethiopia and 5 US\$ in the US, then the conversion rate Birr over US\$ would be 20. While the official exchange rate would be, say, 25, the price level index (with US prices being 100) for Ethiopia would then be $20 / 25 * 100 = 80$.

The results of the ICP round for 2011 for all participating African countries can be found in the World Bank publication “Purchasing Power Parities and the Real Size of World Economies, A Comprehensive Report of the 2011 International Comparison Program”.¹¹⁹

For avoiding confusion, it should be noted that the ICP results employ the terms “deflation” and “real” as attribute for the figures converted with the PPP ratios. But this applies to the spatial (regional) dimension and must not be confused with the elimination of price changes in the temporal dimension where we also speak of “real” terms and of “deflation”. ICP 2011 Global Report, page 12: “In ICP comparisons, volumes (referred to as real expenditures) are mostly estimated indirectly using direct measures of relative prices—PPPs—to deflate nominal expenditures. In addition to being spatial price deflators, PPPs are currency converters. Thus, PPP-deflated expenditures are expressed in a common currency unit and are also valued at the same price level.”

Similarly, the terms “current” and “constant”, when used in the context of PPP and the international \$ (spatial price comparison), must not be confused with the same terms used in inter-temporal comparisons. For PPP, there are, in principle, two options. One is the conversion of all years of the time-series of GDP in local (national) currencies to the PPP of the latest ICP round which, for the time being, is 2011. The results of conversion to PPP 2011 would have the dimension “constant international \$”. The other option would be the conversion to the “current international \$”. We then use the conversion rates of the respective years.

To give an example: the PPP conversion rate for “constant international Dollars” (for the time being 2011) for, say, Tanzania may be lower than the one which will emerge from the 2017 round of international price comparisons. But this does not necessarily mean that it is result of inflation in Tanzania. It may as well, and at least partly, be the result of inflation in the US.

ICP PPPs are designed specifically for international comparisons of GDP. They are not designed to compare monetary flows or trade flows. International comparisons of flows—such as development aid, foreign direct investment, migrants’ remittances, or imports and exports of goods and services—should be made with exchange rates, not with PPPs.¹²⁰

(114) “The easiest way to see how a PPP is calculated is to consider a good which is identical in two countries. A simple example would be a litter of Coca Cola. If it costs 15.00 francs in France and \$2.00 in America then the PPP for Coca Cola between France and the USA is 15.00/2.00, or 7.50. This means that for every dollar spent on a bottle of Coca Cola in the USA, 7.50 francs would have to be spent in France to obtain the same quantity and quality - or, in other words, the same volume - of Coca Cola. PPPs are not only calculated for individual commodities; they are also calculated for various groups of commodities (e.g., refreshments, vegetables).” Source: UNSD, SNA News and Notes

(115) For example, Utz Reich, PPPs for SDRs? Some theoretical observations on how to normalise, capture the dynamics, and extend the application of global purchasing power parities, in: *Journal of Economic and Social Measurement*, 38 (2013). In the SNA, the term „dollarization” is also used for a case “when one economy unilaterally adopts the currency of another economy, such as with ‘dollarization’” (SNA 26.109).

(116) <http://www.worldbank.org/en/programs/icp>

(117) African Union, *Statistics Pocketbook 2018*, web reference https://ec.europa.eu/eurostat/documents/46346/9314552/PAS_Pocketbook2018_Web+version.pdf/4a906281-3dca-4834-af72-1c52142251a0

(118) “GK” stands for “Geary Khamis”, the name of the most common method in calculating the PPP in “international \$”, also called Geary Khamis dollars. For mor details see SNA 15.214.

(119) <http://pubdocs.worldbank.org/en/711001503680105564/ICP2011-Global-Report.pdf>

(120) WB; *Global Report ICP Round 2011*, page 13

12.7. Classification of the functions of the government

01 – GENERAL PUBLIC SERVICES

- 01.1 – Executive and legislative organs, financial and fiscal affairs, external affairs
- 01.2 – Foreign economic aid
- 01.3 – General services
- 01.4 – Basic research
- 01.5 – R&D General public services
- 01.6 – General public services n.e.c.
- 01.7 – Public debt transactions
- 01.8 – Transfers of a general character between different levels of government

02 – DEFENSE

- 02.1 – Military defense
- 02.2 – Civil defense
- 02.3 – Foreign military aid
- 02.4 – R&D Defense
- 02.5 – Defense n.e.c.

03 – PUBLIC ORDER AND SAFETY

- 03.1 – Police services
- 03.2 – Fire-protection services
- 03.3 – Law courts
- 03.4 – Prisons
- 03.5 – R&D Public order and safety
- 03.6 – Public order and safety n.e.c.

04 – ECONOMIC AFFAIRS

- 04.1 – General economic, commercial and labor affairs
- 04.2 – Agriculture, forestry, fishing and hunting
- 04.3 – Fuel and energy
- 04.4 – Mining, manufacturing and construction
- 04.5 – Transport
- 04.6 – Communication
- 04.7 – Other industries
- 04.8 – R&D Economic affairs
- 04.9 – Economic affairs n.e.c.

05 – ENVIRONMENTAL PROTECTION

- 05.1 – Waste management
- 05.2 – Waste water management
- 05.3 – Pollution abatement
- 05.4 – Protection of biodiversity and landscape
- 05.5 – R&D Environmental protection
- 05.6 – Environmental protection n.e.c.

06 – HOUSING AND COMMUNITY AMENITIES

- 06.1 – Housing development
- 06.2 – Community development
- 06.3 – Water supply
- 06.4 – Street lighting
- 06.5 – R&D Housing and community amenities
- 06.6 – Housing and community amenities n.e.c.

07 – HEALTH

- 07.1 – Medical products, appliances and equipment
- 07.2 – Outpatient services
- 07.3 – Hospital services
- 07.4 – Public health services
- 07.5 – R&D Health
- 07.6 – Health n.e.c.

08 – RECREATION, CULTURE AND RELIGION

- 08.1 – Recreational and sporting services
- 08.2 – Cultural services
- 08.3 – Broadcasting and publishing services
- 08.4 – Religious and other community services
- 08.5 – R&D Recreation, culture and religion
- 08.6 – Recreation, culture and religion n.e.c.

09 – EDUCATION

- 09.1 – Pre-primary and primary education
- 09.2 – Secondary education
- 09.3 – Post-secondary non-tertiary education
- 09.4 – Tertiary education
- 09.5 – Education not definable by level
- 09.6 – Subsidiary services to education
- 09.7 – R&D Education
- 09.8 – Education n.e.c.

10 – SOCIAL PROTECTION

- 10.1 – Sickness and disability
 - 10.2 – Old age
 - 10.3 – Survivors
 - 10.4 – Family and children
 - 10.5 – Unemployment
 - 10.6 – Housing
 - 10.7 – Social exclusion n.e.c.
 - 10.8 – R&D Social protection
 - 10.9 – Social protection n.e.c.
- Source: UNSD

12.8. Abbreviations

AfDB	African Development Bank	ISO	International Organisation for Standardisation
ASS	African Statistical System	MPS	Material Product System
ASYB	African Statistical Yearbook	MSITS	Manual on Statistics of International Trade in Services
ASYCUDA	Automated System for Customs Data (UNCTAD)	n.e.c.	Not elsewhere classified
BIS	Bank of International Settlement	NOE	Non-observed Economy
BOP	Balance of Payments	NGO	Non-Government Organization
BR	Business Register	NA	National Accounts
BPM	Balance of Payments Manual	NHA	National Health Accounts
CF	Commodity flow (in the SNA called product flow)	NPI	Non-Profit Institution
cfc	Consumption of fixed capital	NPISH	Non-Profit Institutions Serving Households
cif	Cost, insurance, freight	ODA	Official Development Assistance
COICOP	Classification Of Individual Consumption by Purpose	OECD	Organisation of Economic Co-operation and Development
COFOG	Classification Of the Functions Of the Government	PLI	Comparative Price Level Index
CPC	Central Product Classification	PPI	Producer Price Index
CPI	Consumer Price Index	PPP	Purchasing Power Parities
CY	Calendar year	REC	Regional Economic Community
CSV	Comma separated values	R&D	Research and Development
ECB	European Central Bank	SDMX	Statistical Data and Metadata Exchange
e-GDDS	Enhanced General Data Dissemination Standard	SHA	System of Health Accounts
Eurostat	Statistical office of the European Union	SOE	State-owned enterprises
FAO	Food and Agriculture Organization	SPE	Special Purpose Entities
FISIM	Financial Intermediation Services Indirectly Measured	STATAFRIC	Statistical arm of the African Union Commission
fob	Free on board	SUT	Supply and Use Table
FY	Fiscal year	TA	Technical Assistance
GDP	Gross Domestic Product	SNA	System of National Accounts
GFS	Government Finance Statistics	UNCTAD	United Nations Conference on Trade and Development
GFCF	Gross Fixed Capital Formation	UNECA	United Nations Economic Commission for Africa
GOS	Gross Operating Surplus	UNODC	United Nations Office on Drugs and Crime
GVA	Gross Value Added	UNSD	United Nations Statistics Department
HS	Harmonized System	US	United States
IC	Intermediate consumption	UVI	Unit value index
ICP	International Price Comparison Programme	VAT	Value Added Tax
ILO	International Labour Organization	WB	World Bank
IMF	International Monetary Fund	WCO	World Customs Organization
IMTS	International Merchandise Trade Statistics	WHO	World Health Organization
IPP	Intellectual Property Products	WTO	World Trade Organization
ITRS	International transactions reporting system	XML	Extensible Markup Language
ISIC	International Standard Industrial Classification, revision 4		

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