Supply and use tables methodological guide

Application in selected Arab countries

Part 1. Morocco

Shared Prosperity **Dignified Life**

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Shared Prosperity **Dignified Life**

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Economic and Social Commission for Western Asia

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Preface

According to the best international practices in the national accounts area, supply and use tables (SUTs) are the perfect statistical framework for improving the inclusivity of Gross Domestic Product (GDP) statistics and consistency between all economic activities, as well as facilitating the coverage of informal activities. In this context, ESCWA's work programme included a major component on SUTs under the Technical Cooperation Programme for 2015-2020, the Data and Statistics project for 2018-2020, and the statistics sub-programme funded by the United Nations Development Account. Furthermore, ESCWA conducted a study in Arabic on "Regional guidelines for Arab countries on supply and use";[1] organized regional and subregional training workshops;[2] dispatched several technical assistance missions to member States; and organized twinning projects between two sets of countries.

ESCWA also collaborated with several Arab statistical offices to test various supply and use applications, such as ERETES and HendyPlan-SUT-Equalizer. Despite the progress achieved by some national statistical offices in Arab countries in developing SUTs and adopting them in GDP estimates, many challenges still need to be addressed in terms of filling data gaps, developing valuation methods, using technology and improving policymaking. This study was planned to provide an overview of the recent developments in SUTs and a case study on Moroccan SUTs, and to guide Arab national statistical offices (NSOs) in better assessing macroeconomic aggregates and providing a useful tool for monitoring Sustainable Development Goals (SDGs). This study was carried out by Ms Wafa Aboul Hosn, Mr Omar Hakouz and Mr Majed Skaini from the Economic Statistics Section of the Statistics Division at ESCWA.

1. E/ESCWA/SD/2014/technicalpaper.2. Study on Selected Methodological Issue in Economic Statistics 2014: Guidelines for Compilation of Supply and Use Tables in the Arab Countries and Data Sources.
2. http://www.aitrs.org/DetailsPage/NewsDetails.aspx?NewsID=1068 (last accessed: November 2021).

Key messages

- *The study recommends giving high priority to the compilation of SUTs to ensure that the GDP estimates are reliable and exhaustive, and it includes the Moroccan case study to demonstrate how to achieve this goal. Some of the productive activities have to be indirectly measured using proxy information, including employment data, tax audit and economic models to estimate production in missing elements, such as informal sector, underground production and illegal activities, so as to ensure that all productive activities undertaken in the economy are accounted for.*

- *Most Arab countries lack comprehensive and reliable data sources rendering the compilation of SUTs for these economies a laborious task and requiring a large investment in human resources and data sources to ensure the quality of the national accounts estimates. To overcome data gaps and unavailability of detailed breakdowns, the study recommends: (a) using administrative sources for statistical purposes; (b) organizing visits to the most important enterprises to collect information on the structure of their output and input; (c) directly asking data suppliers and relevant parties (experts, professional unions, etc.) about the input's structure of a given industry; and (d) using technical coefficients from a neighbouring country as a starting point.*

- *In order to carry out a project of building SUTS and to benefit from producing such a complex system, the study recommends the following: (a) setting up a detailed work schedule in which the timing of each step (collect and data processing, balancing SUT, dissemination) is specified and well known by the suppliers and users of the basic data used for SUTs; (b) strengthening the collaboration between statistical offices and relevant ministries for sharing data sources used as inputs for the tables; (c) setting an optimal balance between the efforts of processing and the relative importance of the outputs; (d) using an appropriate IT tool for managing the database and processing SUTs, in addition to using manual methods of balancing in order to reach convergence between the rows and columns of the tables; (e) documenting production processes in very comprehensive methodological notes; and (f) producing SUTs every five years when compiling national accounts of the benchmark year because statistical offices cannot handle the burden of producing SUTs annually.*

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Abbreviations

BOP	Balance of payments
CFC	Consumption of fixed capital
CIF/c.i.f.	Cost, insurance, and freight
COE	Compensation of employees
COICOP	Classification of Individual Consumption According to Purpose
CPC	Central Product Classification
DP	Domestic production
ENSI	National survey on the informal sector (Enquête nationale sur le secteur informel)
FISIM	Financial intermediation services indirectly measured
FOB/f.o.b.	Free on board
GCE	Government consumption expenditure
GDP	Gross domestic product
GDP (E)	Gross domestic product by expenditure approach
GDP (I)	Gross domestic product by income approach
GDP (P)	Gross domestic product by production approach
GFCE	Government final consumption expenditure
GFCF	Gross fixed capital formation
GOS	Gross operating surplus
GVA	Gross value added
HFCE	Household final consumption expenditure
IC	Intermediate consumption
ISIC	International Standard Industrial Classification of All Economic Activities
LFS	Labour force survey
M	Imports of goods and services
NPISH	Non-profit institutions serving households
SNA	System of National Accounts
SUT	Supply and use table
TTM	Trade and transport margins
VAT	Value added tax
X	Exports of goods and services
UNSD	United Nations Statistics Division

1. An overview of the supply and use tables (SUTs)

A. Introduction

National accounts inform on a country's economic situation by describing complex transactions among different economic actors, namely households, the Government, legal entities (such as companies) and institutions outside the country border (known as the rest of the world).

The System of National Accounts (SNA), which governs national accounts, should be able to describe economies which, over time, are becoming increasingly complex, whilst envisaging at the same time descriptive simplicity. It covers a wide variety of situations, from developed countries to developing countries, least developed countries and countries in transition. Irrespective of the stage of development, and in order to "measure the economy", some adaptations of the system are necessary to take into account the different realities. The SNA is a system of macroeconomic accounts based on a set of concepts, definitions, classifications and registration rules. It provides a statistical framework within which economic data can be collected and analysed to assist decision-makers and provide guidance on economic policies. National accounts aim to describe the economic activity (measurable in monetary terms) of every unit of a national economy. The basic concepts of the SNA are used to analyse and aggregate the numerous aspects of the elementary actions in the economy.

To present a comprehensive view of the economy, the SNA proposes the construction of SUTs. These tables provide the elements of the production process, the uses of goods and services (products) and the incomes generated by this production. The development of these tables is complex and difficult but offers many benefits.

Due to the large amount of information mobilised during its development, the SUT enhances the credibility of the indicators produced by the national accounts. It is the relevant framework for the convergence and the integration of the three approaches used for measuring the GDP (production, expenditure, and income approaches).

B. SUTs: the cornerstone of the SNA

SUTs play an important role as an integration framework of the national accounts. As a key feature of national accounts, SUT provides the ideal concept for balancing supply and demand and is the best framework for compiling GDP.

SUTs constitute a comprehensive description of the economy, providing detailed information on the production processes, the interdependencies in production, the use of goods and services and the generation of income through production. After balancing, SUTs provide coherent data linking the output of industries and imports with intermediate and final uses of the products.

These tables show the structure of the costs of production and the income generated during the production process, the flow of goods and services produced within the national economy and the flow of goods and services with the rest of the world.

As SUTs play an important role in ensuring the consistency and overall quality of the national accounts, the SNA recommends that the compilation of GDP estimates be based on the supply and use framework. However, this can only be achieved if SUTs are compiled as a fully integrated part of national accounts calculation. This target is certainly a huge challenge, especially for countries with a loose connection between datasets and their actual compilation, or for countries where SUTs are calculated after the compilation of the national accounts is completed. However, with a view to the overall goal of producing reliable estimates of national accounts data, every effort should be undertaken to achieve an integrated compilation system for macroeconomic data.

C. The architecture of the SUT

An SUT gathers in the same accounting framework, the goods and services accounts by product type and the production and generation of income accounts for producing industries (the industries' accounts).

Elaborating the SUT involves the preparation of the industries' accounts and the goods and services accounts (the supply and use balance (SUB)). This elaboration is carried out in a joint manner, and through iterations that converge to balanced SUT.

1. Goods and services account

Goods and services that are the output of the production process, can be used in five ways:

- They can be consumed as inputs for further processing by other industries (intermediate consumption).
- They can be consumed for direct satisfaction of collective needs and wants (final consumption).
- They can be used for capital formation, to facilitate the continued production of other goods and services (gross fixed capital formation).
- They may be kept in inventories during the process.
- They can be exported to the rest of the world.

The purpose of the goods and services account is to balance total resources in the form of goods and services against the various uses of those resources. This account is the most fundamental in the whole system of national accounts.

The population of the product balance is based on the key principle of national accounts: "Fundamental to the SNA is the identity that goods and services produced in the economy must be consumed, used for capital formation or exported while all goods and services used within the economy must be produced in the economy or imported".[3]

3. SNA 2008 (chapter 1).

Table 1. Components of the goods and services account

Resources	Uses
Output (P1)	Intermediate consumption (P2)
Market output (P11)	Final consumption expenditure (P3)/Actual final consumption (P4)
Output for own use (P12)	Individual consumption expenditure (P31)/Actual individual consumption (P41)
Other non-market output (P13)	Collective consumption expenditure (P32)/Actual collective consumption (P42)
Taxes on products (D21)	Gross fixed capital formation (P51)
Subsidies on products (D31)	Changes in inventories (P52)
Imports of goods and services (P7)	Acquisitions *less* disposals of valuables (P53)
	Exports of goods and services (P6)

Note: Codes in parentheses are as used in the 2008 SNA.

The equation underlying this principle leads to the product balance (or the commodity balance):

Output + imports = intermediate consumption + final consumption + capital formation + exports

To establish the balance between supply and use at the detailed level of goods and services classification, the commodity-flow method is the most common method used.

This approach provides a description of the supply/use balance for a single product based on the identity in the goods and services account, which shows how the total supply of a product is equal to the total amount used:

Output + imports (i.e. total supply) = intermediate consumption + final consumption + gross capital formation + exports (i.e. total uses)

Box 1. Concrete example: supply and use of cars

To make this concrete, consider an economy with three industry sectors: agriculture, manufacturing and services. For the sake of simplicity, we follow only one product in our example: cars. These cars are either produced domestically or imported. That is a short description of the supply side.

The use table shows how the cars are used in the economy. Firstly, there is intermediate consumption, which means that the cars are used in the production of another product. For example, when a car is transformed and sold as a camping car, then it has been used by the manufacturing industry.

Secondly, there are different sorts of final use. When a car is sold to a consumer, then it has been used for final consumption. But when a car is sold to a catering firm or a farmer for professional use, it has been used as an investment (capital formation).

Finally, the car can be exported to another country. The sum of all these different uses should equal the total supply for each product. Since supply and use are recorded in monetary terms, it is required that both are valued in the same way, either in basic prices or at purchasers' prices.

Source: Eurostat (n.d.). Statistics Explained.

2. Industries' accounts

The production and generation of income accounts in the integrated economic accounts are given only by institutional sectors and with a global balance of transactions on goods and services.

For the needs of elaborating SUTs, detailed data on production activities by industry are produced. It includes the following:

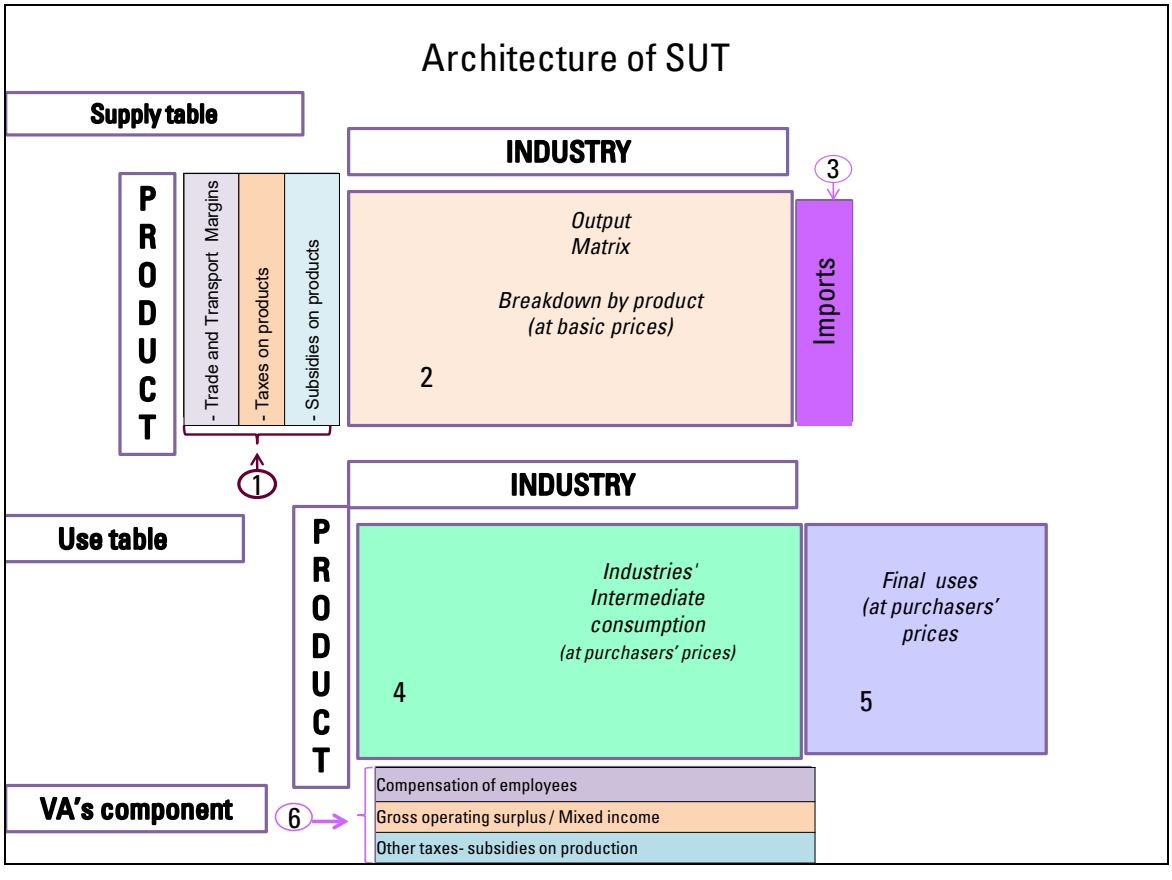
(a) The output of industries by product;
(b) The intermediate consumption by industry and product;
(c) The generation of income accounts for each industry according to economic activity.

Globally, the production and generation of income accounts by industry make it possible to measure the gross value added of industries (i.e. their productive contribution), and their gross operating surplus as well as their gross mixed income.

3. General structure of SUTs

SUTs provide detailed information on the production processes, the interdependencies in production, the use of goods and services and generation of income during the production process. The supply and use framework enables detailed analysis of industries and products through a breakdown of the production account, the goods and services account and the generation of income account. These tables show the structure of the costs of production and income generated in the production process, the flow of goods and services produced within the national economy, and the flows of goods and services with the rest of the world.

ERETES' SUT architecture



The above figure illustrates a general structure of an SUT. The SUT is presented as a set of several sub-tables articulated with each other and organized into three levels:

- The first level is dedicated to the origin of products. It presents the total supply of goods and services from both domestic and foreign producers that are available for use in the domestic economy.
  - Quadrant 1 shows the valuation matrices for trade and transport margins and taxes and subsidies on products allowing the transformation of supply from basic prices to purchasers' prices.
  - Quadrant 2 shows the output of domestic industries at basic prices by type of product.
  - Quadrant 3 presents the import of goods and services valuated at c.i.f. prices.
- The second level refers to the use of products as intermediate or final uses. It comprises quadrant 4 which presents the intermediate consumption matrix by industry and type of product and quadrant 5 which shows the final uses of product (final consumption, gross capital formation and export).
- The third level comprises quadrant 6 which presents the income generation accounts by industry.

2. Concepts related to SUTs

A. Production boundary

The SNA production boundary refers to all economic activities undertaken by institutional units to contribute to economic performance. This economic production may be defined as activity carried out under the control of an institutional unit that uses inputs of labour or capital, goods and services to produce outputs of other goods and services. They are all activities where an output is owned and produced by an institutional unit, for which payment or other compensation has to be made to enable a change of ownership to take place.

The production boundary of the SNA includes the following activities:

(a) The production of all goods or services that are supplied to units other than their producers, or intended to be so supplied, including the production of goods or services used up in the process of producing such goods or services;
(b) The own-account production of all goods that are retained by their producers for their own final consumption or gross capital formation;
(c) The own-account production of knowledge-capturing products that are retained by their producers for their own use as final consumption or gross capital formation excluding (by convention) such products produced by households for their own use;
(d) The own-account production of housing services by owner occupiers;
(e) The production of domestic and personal services by employing paid domestic staff.

The decision whether to include a particular activity within the production boundary takes the following into account:

- Does the activity produce a useful output?
- Are the products or activity marketable and does it have a market value?

If the product does not have a meaningful market value can a market value be assigned (for instance, can a value be imputed)?

Box 2. Production Boundary

The activity of production is fundamental. In the SNA, production is understood to be a physical process carried out under the responsibility, control and management of an institutional unit, in which labour and assets are used to transform inputs of goods and services into outputs of other goods and services. All goods and services produced as outputs must be such that they can be sold on markets or at least be capable of being provided by one unit to another, with or without charge. The SNA includes within the production boundary all production actually destined for the market, whether for sale or barter. It also includes all goods or services provided free of charge to individual households or collectively to the community by government units or NPISHs.

B. Production versus output

It should be noted that the production is an activity carried out by an establishment while the output is defined as the goods and services produced by an establishment excluding:

- The value of any goods and services used in an activity for which the establishment does not assume the risk of using the products in production.
- The value of goods and services consumed by the same establishment except for goods and services used for capital formation (fixed capital or changes in inventories) or own final consumption.

C. Market output, output for own final use and non-market output

The SNA introduces a distinction between market output and non-market output because of the way the output of each is valued:

Market output: It consists of output that is sold or intended to be sold on the market and that is valued at market price. It is simply the total sales plus changes in inventories.

Output for own final use: It consists of products retained by the producer for his own use as final consumption or capital formation.

Non-market output: It consists of goods and individual or collective services produced by non-profit institutions serving households (NPISHs) or government that are supplied free, or at prices that are not economically significant, to other institutional units or the community as a whole.

The non-market output, as well as output for own final use, is difficult to value, as there is often no meaningful selling price. By convention, it is therefore valued as the sum of the costs of production. It is valued as labour costs plus intermediate consumption plus depreciation of fixed assets. None of these are actually output, but they provide the best available approximation.

D. The valuation system in the SNA

In the SNA, different prices are used to value inputs, outputs and purchases, with prices being different depending on the perception of the bodies engaged in the transaction.

For example, the producer and user of a product will usually perceive the value of the product differently with the result that the output prices received by producers can be distinguished from the prices paid by purchasers.

1. Basic prices

The basic prices reflect the amount received by the producer for a unit of goods or services, minus any taxes payable, and plus any subsidy receivable on that unit as a consequence of its production or sale. They exclude any transport charges invoiced separately by 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.

The basic prices are the preferred method of valuing output and GVA in national accounts, however when a valuation at basic prices is not feasible then producers' prices may be used.

2. Producers' prices

Producers' prices may be thought of as the prices of goods and services 'at the factory gate'. This valuation includes all other taxes on production and some taxes on products. The producer's price is the price, excluding VAT, which the producer invoices to the purchaser.

The producer's price is the amount receivable by the producer from the purchaser for a unit of a good or service produced as output minus any VAT, or similar deductible tax, invoiced to the purchaser. It excludes any transport charges invoiced separately by the producer.[4]

Neither the producer's price nor the basic price includes any amounts receivable in respect of VAT, or similar deductible tax, invoiced on the output sold.

3. Purchasers' prices

Purchasers' prices are prices incurred by the purchaser, including transport costs, trade margins and taxes (unless the taxes are deductible by the purchaser).

The SNA defines the purchaser's price as the amount paid by the purchaser, excluding any VAT or similar tax deductible by the purchaser, in order to take delivery of a unit of a good or service at the time and place required by the purchaser. The purchaser's price of a good includes any transport charges paid separately by the purchaser to take delivery at the required time and place.

Box 3. Basic, producers' and purchasers' Prices

Basic prices
+
Taxes on products excluding invoiced VAT
-
Subsidies on products
=
Producers' prices
+
VAT not deductible by the purchaser
+
Separately invoiced transport charges
+
Wholesalers' and retailers' margins
=
Purchasers' prices

Source: SNA 2008 (chapter 6).

E. Gross domestic product (GDP)

Arguably the best-known national accounts statistic, GDP is the primary indicator of economic activity. When external commentators describe the growth or decline of the economy, they are referring to the change in GDP.

GDP can be estimated in three ways:

1. The production approach

The production approach, or GDP (P), is primarily concerned with the generation of value added, in other words, the value of all goods and services produced within the economy. Through the production approach, GDP measures the total gross value added from all institutional units resident in the economy, as gross value added on a production basis is valued at basic prices. To convert from GVA at basic prices to GDP at market prices,

4. SNA 2008.

taxes on products (such as value added tax VAT) are added and subsidies on products are subtracted.

Using the production approach:

GDP = the sum of gross value added (GVA) of the institutional sectors or industries
plus taxes on products and imports,
less subsidies on products

Where:

GVA = the total value of output of goods and services produced
less the intermediate consumption (goods and services used up in the production process to produce the output).

GDP is also the balancing item in the whole economy production account.

2. The expenditure approach

The expenditure approach, or GDP (E), is the sum of all final expenditures within the economy, that is, all expenditure on goods and services which are not used up or transformed in a productive process. In other words, GDP is equal to household (and NPISH) final consumption expenditure plus general government final consumption expenditure plus gross capital formation plus exports less imports.

Household final consumption expenditure comprises all the goods and services purchased and consumed by households. This includes food, clothing, cars, rental on houses, holidays, etc. It does not include the purchase of houses or payment of interest on loans (SNA interest) which are expenditure on assets and property income respectively, and not consumption expenditure.

Government final consumption expenditure relates to the purchases Government has to make to deliver its services and, like non-market output, is valued as procurement plus staff costs plus depreciation. This is so defined as government expenditure, by convention, as government is assumed to consume its own output; in other words, government provides services, such as defence, which it then uses on behalf of society. This does not include government's capital expenditure (see gross capital formation).

Gross capital formation (which can be thought of as investment) is made up of three parts. The first (and largest) is gross fixed capital formation (GFCF), which relates to the purchase (and disposal) of fixed assets. Fixed assets are items which contribute to a productive process for more than a year and are not used up in the process of production. Examples of such assets are buildings (including dwellings), vehicles, plant and machinery, computer systems and aircraft. The second component is changes in inventories, which is made up of materials and fuel, work in progress and finished unsold goods. The third component is acquisitions less disposals of valuables. Valuables are defined as goods which do not contribute to a process of production but are a store of value for the owners. These include jewellery, precious metals, works of art and antiques.

Exports are goods and services produced in the country and purchased by the rest of the world; conversely, **imports** are goods and services produced in the rest of the world and purchased by resident units.

The total of exports minus imports is known as the balance of trade.

3. The income approach

The income approach, or GDP (I), is the sum of all income generated by production activity, also known as factor incomes. In other words, GVA is equal to the sum of employment income (compensation of employees), self-employment income (mixed income) and profits (gross operating surplus).

Compensation of employees is the sum of all employment income, including wages and salaries, employers' pension and National Insurance contributions, bonuses and benefits in kind.

Gross operating surplus is officially defined as the balance between GVA and labour costs paid by producers. In effect, it is equal to the sum of gross trading profits and income earned through the ownership of buildings (rental income).

Mixed income is a combination of these two for the self-employed. It recognizes that the income of the self-employed is a combination of employment income and profits, but it is not realistic or appropriate to split it into these two components.

GVA on an income basis is valued at factor cost and to move to GDP at market prices, it is necessary to follow the steps below:

GVA at factor cost + other taxes on production
- other subsidies on production
= GVA at basic prices
+ taxes on products
- subsidies on products
= GDP at market prices

F. Identities within SUTs

Table 2. Identities within SUTs for Morocco for 2007

Supply table

Product						Domestic production by industry									
						A-B	C	D	E	F	G	H-OP			
		Total supply at purchasers' price	Trade margins	Transport margins	Taxes less subsidies on products	Agriculture, hunting and forestry and fishing	Mining and quarrying	Manufacturing	Electricity, gas and water supply	Construction	Trade and repair	Other services	Total domestic production	c.i.f. Imports	c.i.f./f.o.b. adjustment
A-B	Agriculture, hunting and forestry and fishing product	154 788	18 497	863	5 486	109 314	0	812	0	2	0	9	110 137	19 805	
C	Mining and quarrying Product	56 397	1 759	1 216	405	0	17 415	1 184	0	0	0	0	18 599	34 418	
D	Manufacturing Product	662 015	64 287	4 680	27 617	4 160	53	347 425	0	45	6 572	388	358 643	206 788	
E	Electricity, gas and water supply	28 149	0	0	1 913	848	0	0	23 640	183	0	0	24 671	1 565	
F	Construction	104 857	0	0	12 494	0	11	162	193	90 101	1 097	799	92 363	0	

Product						Domestic production by industry									
						A-B	C	D	E	F	G	H-OP			
		Total supply at purchasers' price	Trade margins	Transport margins	Taxes less subsidies on products	Agriculture, hunting and forestry and fishing	Mining and quarrying	Manufacturing	Electricity, gas and water supply	Construction	Trade and repair	Other services	Total domestic production	c.i.f. Imports	c.i.f./f.o.b. adjustment
G	Trade and repair	8 476	-84 543	0	1 022	22	50	5 098	0	293	84 734	1 800	91 997	0	
H-OP	Other services	412 258	0	-6 759	21 974	63	727	5 022	9	789	4 084	371 818	382 512	35 010	-20 479
c.i.f./f.o.b. adjustment													0	-20 479	20 479
Direct purchases abroad by residents		7 614											0	7 614	
Total		1 434 554	0	0	70 911	114 407	18 256	359 703	23 842	91 413	96 487	374 814	1 078 922	284721	0

Use table

			Intermediate consumption by industry								Final uses				
			A-B	C	D	E	F	G	H-OP						
		Total uses at purchasers' prices	Agriculture, hunting, forestry and fishing	Mining and quarrying	Manufacturing	Electricity, gas and water supply	Construction	Trade and repair	Other services	Total IC	HFCE	GFCE	NP ISH	GCF	Expo
A-B	Agriculture, hunting, forestry and fishing Product	154 788	19 811	0	58 410	0	29	1 385	1 914	81 549	51 637	1 461		8 121	12 020
C	Mining and quarrying Product	56 397	0	353	39 445	4 250	3 044	87	516	47 695	281			-131	8 552
D	Manufacturing product	662 015	18 659	3 338	146 051	3 345	48 240	18 481	33 149	271 263	194 265	1 509		89 022	105 956
E	Electricity, gas and water supply	28 149	1 265	333	4 945	593	468	1 488	4 669	13 761	14 323			0	65
F	Construction	104 857	240	15	371	154	43	715	1 248	2 786	3 409			98 662	0
G	Trade and repair	8 476	80	1	0	0	36	149	2 331	2 597	5 873			6	
H-OP	Other services	412 258	1 974	2 177	14 216	1 736	3 534	13 730	51 977	89 344	153 051	113 319	2 341	19 768	34 435

		Intermediate consumption by industry								Final uses				
		A-B	C	D	E	F	G	H-OP						
	Total uses at purchasers' prices	Agriculture, hunting, forestry and fishing	Mining and quarrying	Manufacturing	Electricity, gas and water supply	Construction	Trade and repair	Other services	Total IC	HFCE	GFCE	NPISH	GCF	Expo
Direct purchases in domestic market by non-residents	0								0	-62 834				62 834
Direct purchases abroad by residents	7 614								0	7 614				
Total	1 434 554	42 029	6 217	263 438	10 078	55 394	36 035	95 804	508 995	367 619	116 289	2 341	215 448	223 862
Total gross value added/Gross domestic product	569 927	72 378	12 039	96 265	13 764	36 019	60 452	279 010	569 927					
Compensation of employees	202 924	10 798	2 608	30 203	5 554	9 622	17 301	126 838	202 924					
Other taxes less subsidies on production	7 431	144	779	2 896	234	409	1 042	1 927	7 431					
Gross operating surplus	359 572	61 436	8 652	63 166	7 976	25 988	42 109	150 245	359 572					

1. Product balance

For each product (in rows), total supply at purchasers' prices = total uses at purchasers' prices:

Domestic output + trade margin + transport margin + taxes less subsidies on products + Import = IC + HFCE + GFCE + NPISH + GCF + Export

Product	Total supply	Total uses
Agriculture, hunting, forestry and fishing product	110 137 + 18 497 + 863 + 5 486 + 19 805 = 154 788	81 549 + 1 461 + 8 121 + 12 020 = 154 788
Mining and quarrying product	18 599 + 1 759 + 1 216 + 405 + 34 418 = 56 397	47 695 + 281 – 131 + 8 552 = 56 397
Manufacturing product	358 643 + 64 287 + 4 680 + 27 617 + 206 788 = 662 015	271 263 + 194 265 + 1 509 + 89 022 = 662 015
Electricity, gas and water supply	24 671 + 1 913 + 15 659 = 28 149	13 761 + 14 323 + 65 = 28 149
Construction	92 363 + 12 494 = 104 897	2 786 + 3 409 + 98 662 = 104 897
Trade and repair	91 997 – 84 543 + 1 022 = 8 476	13761 + 14323 + 65 = 28149
Other services	382 512 – 6 759 + 21 974 = 412 258	89 344 + 153 051 + 113 319 + 2 341 + 19 768 + 34 435 = 412 258

2. Identity by industry

In each column, output by industry = input by industry, this means that for each industry:

Output = intermediate consumption + GVA
= intermediate consumption + compensation of employees + other taxes
– subsidies on production + gross operating surplus

Industry	Output	Input				
		IC	COE	Other net taxes	GOS	Total input
Agriculture, hunting, forestry and fishing	114 407	42 029	10 798	144	61 436	114 407
Mining and quarrying	18 256	6 217	2 608	779	8 652	18 256
Manufacturing	359 703	263 438	30 203	2 896	63 166	359 703

Industry	Output	Input				
		IC	COE	Other net taxes	GOS	Total input
Electricity, gas and water supply	23 842	10 078	5 554	234	7 976	23 842
Construction	91 413	55 394	9 622	409	25 988	91 413
Trade and repair	96 487	36 035	1 7301	1 042	42 109	96 487
Other services	374 814	95 804	126 838	1 927	150 245	374 814
Total	1 078 922	508 995	202 924	7 431	359 572	1 078 922

3. GDP measured using the production approach (P)

Using the production approach, GDP (P) is the sum of GVA at basic prices plus taxes less subsidies on products.

Total output at basic prices (a)	1 078 922
Total intermediate inputs at purchasers' prices (b)	508 995
GVA at basic prices (a-b)	569 927
Taxes less subsidies on products (c)	70 911
GDP at market prices (a – b + c)	640 838

4. GDP measured using the income approach (I)

GDP at basic prices is also equal to the costs of employment (wages, national insurance and pension contributions), any taxes, less subsidies, levied upon production and gross operating surplus.

Using the production approach, GDP (I) is equal to compensation of employees + gross operating surplus + taxes less subsidies on product and production.

Compensation of employees (a)	202 924
Gross operating surplus (b)	359 572
Taxes, less subsidies, on production (c)	7 431
Taxes less subsidies on products (d)	70 911
GDP at market prices (a + b + c + d)	640 838

5. GDP measured using the expenditure approach (E)

GDP using the expenditure approach (GDP (E)) is calculated as the sum of total final demand less total imports.

Total domestic demand comprises purchases (including all taxes that may apply) by households, non-profit institutions, and the Government, gross fixed capital formation and changes in inventories.

The following table shows the calculation of GDP (E) for Morocco in 2007:

Household final consumption	367 619
NPISH expenditures	2 341
General government final consumption	116 289
Gross capital formation	215 448
Exports	223 862
Total final demand (a)	925 559
Total imports (b)	284 721
GDP at market prices (a-b)	640 838

3. Implementation of SUT steps and methodology

A. The process of implementation of SUT

The process of elaboration of SUTs is complex especially when it is operated as an integral part of national accounts estimation. Moreover, it requires a rigorous coordination, since it is based on the progressive convergence of very diverse data within a single framework that is the SUT. National accounts are an economic model that a country intended to use as a support for the macroeconomic analyses and decision making. To produce them, national accountants use a multitude of basic data from diverse sources, especially, administrative sources and statistical surveys. From the basic data to a balanced SUT, five major stages can be distinguished:

1. Stage 1

It is an introductory stage linked to the implementation of the SUT in a given country. It necessarily precedes the preparation of any base year. It allows the adaptation to the local economy of the concepts and definitions proposed by international statistical bodies, in particular, taking into consideration the last revision of the SNA (2008 version) and how to conform better to international standards. It must also take into account the resources available to the country to prepare its national accounts. It cannot be dissociated from strategic decisions regarding the preparation of accounts. Among the tasks to be foreseen, we can mention:

- The inventory of the available sources.
- A translation of classifications into local reality, in particular with regard to institutional units, market and non-market industries, taxes, etc. When starting an SUT project, a set of classification codes has to be established. The classification codes used should preferably be kept unchanged for some years to facilitate use of value indices for updating the SUT from one year to the next year.
- The list of the productive chains that must be taken into account, with an inventory of their technical characteristics.
- The valuation methods that should be used.

This stage appears only once, on the occasion of the launch of a new series of accounts; the following stages, on the other hand, are repeated with each new annual elaboration.

2. Stage 2

During the second stage, all possible data are collected. To achieve the best possible representation of the accounts for the year under review, “pusillanimous” behaviour is not possible. More precisely:

- It is not acceptable to settle for a single source to value a cell when it is possible to obtain several.
- Any information that is found is worthy of consideration.

- The methodical doubt is de rigueur with respect to all available data (even the most credible ones: The available data are very heterogeneous in all respects, such as scope, concepts, detail, reliability, time of availability and frequency. All statistical sources must be questioned on their reference in terms of time, if they concern payments or they are on an accrual basis).
- The information does not only exist in the Statistical Institute; we also have to look for it in databases of all possible economic actors.
- Information is not only economic, but also legal, administrative, demographic, social, technical, etc. For example, knowledge about chemical processes can be used to produce a plausible estimate of the composition of the inputs and outputs of chemical industry.
- When possible, it is recommended to procure the IT support on where this information is stored.

The collection of data is not a passive role but requires a lot of structural and ad hoc work. This work may consist of the following:

- Negotiations and agreements on data delivery: which data will be delivered, which detail and frequency, when, in what format, how reliable, etc.
- The active monitoring and checking of the data delivery: do the data really arrive at the time and as complete and detailed as agreed upon or expected.
- The storage of the data in the automated systems for compiling the national accounts: this can be, for example, typing in information into spreadsheets or databases, selecting only parts that are relevant for national accounts purposes or translating data to the type of software or lay-out used by the national accountants.
- The search for other relevant quantitative and qualitative information, either by reading specialised journals, newspaper articles and annual reports or by explicitly asking corporations, institutions and experts.

3. Stage 3

The available sources take the most diverse forms. Each one uses specific concepts and classifications, most of the times linked to the characteristics of their respective fields. This stage has the purpose of transposing the information in accordance with the concepts and definitions of national accounts: on the one hand, classifications; on the other, modes of valuation; for example, definitions in bookkeeping records often differ from national accounts definitions. Most obvious is of course the output of trade industry which equals trade margins in national accounts, while in bookkeeping turnover will appear.

The major data sources are usually specific statistics, e.g. on the sales and production costs of producers, capital formation, employment, wages and salaries, household expenditure, consumer prices, producer prices and interest rates, imports and exports or revenues and expenditure by government bodies.

However, raw administrative data can also be very important for compiling SUTs. This can apply, for example, to VAT-records, the business accounts of some big companies, annual reports by supervisory bodies on banking and private insurance or the annual accounts of the central government and social insurance bodies. Furthermore, qualitative information can be important. For example, articles in newspapers or specialised magazines may provide qualitative information on developments (e.g. on sales of

software) or specific events (e.g. a big direct investment project). This information can be used to complete other data, to check the plausibility of other data or to decide on the best way of bookkeeping for specific events and developments.

In general, all the available information should be used in the estimation process or for validation and improving the consistencies between data from various sources. The transposition of data sources to SUT's concepts and classification requires treatments that differ according to the sources and countries.

4. Stage 4

This stage refers to the analytical synthesis of all the collected data, which is done with the two complementary instruments:

- The balance of the supply and use (SUB) of goods and services (also known as commodity flow balance).
- The production and generation of income accounts of the industries (within the framework of an analysis of their production function).
- Both instruments are prepared based on details provided according to selected classifications. Productive chains impose links between some of them: it is really interesting to highlight the relationships that exist between industries which constitute a productive chain. The industries' accounts are prepared taking into account the factors of production mobilized (raw materials, labour force involved, fixed capital). The instruments of work are planned in such a way that hypotheses about the unregistered economy (informal sector, illegal activities and other non-observed economy) can progressively be incorporated.

5. Stage 5

It is the stage of the final synthesis. Once the supply and use balance sheets and the industries' accounts have been prepared, the different resulting data are gathered within the framework of the SUT. The process is then done in two directions:

- A critical analysis of the figures obtained, among which are, on the one hand, the GDP and the elements of final demand and, on the other hand, the primary distribution and the gross operating surplus (or mixed income) by industry.
- An arbitration on intermediate consumption to reach a complete convergence between the data coming from the supply (commodity balance sheet) and the demand sides (industries production accounts).

The working time devoted to each stage of SUTs implementation differs between countries depending on whether the statistical office is producing these tables for the first time or it had already accumulated experience in this area.

If SUTs are produced for the first time, the pre-balancing stage (inventory and collection of all available data, transposing data into national accounts' concept, choice of classification) will consume a considerable amount of time, especially since national accountants in charge of SUTs can be involved in methodological preparation of surveys to be carried out in order to meet SUTs' needs.

However, if the statistical office has previous experience in producing SUTs, efforts will be concentrated on the balancing stage, as all data sources are already determined, and bridge tables are set up between SUT's classification and the classification used in data sources.

Box 4. Documentation

Since the compilation of supply and use data is a complex process, a thorough documentation of the basic data and methods used, the problems encountered, and the results achieved is highly recommended. Such an inventory is not only worthwhile for purposes of publication but also for internal use in the compilation process itself. When SUTs have to be balanced, information on the sources and methods of estimation for each supply and use element is needed. This will be of help when analysing the reasons for imbalances. The documentation then helps to evaluate the quality of data and to outline the balancing strategy. Of course, the balancing steps should also be documented to avoid the repetition of changes and destruction of already balanced data.

Documentation of the various compilation steps will also point to missing data and basic data quality issues. It is important that such findings are used as feedbacks to primary statistics and give pointers to improving the compilation methodology. A documentation system for SUT compilation should be seen in the frame of the overall documentation system of national accounting.

In these conditions, generally, the pre-balancing stage takes almost 25 per cent of the working time of national accountants responsible for SUTs, the balancing process takes up 60 per cent of their working time while 15 per cent of it will be spent on the final synthesis and preparation of the publication.

B. Structure of SUTs and classifications

The first step in setting up an SUT is defining the dimension of the table according to the classification of industries and products that will be used.

1. Classifications of industries and goods and services

The producing units to be identified in SUTs are determined by reference to an industrial classification that describes the relationships between industries and their characteristic products. ISIC is the classification of activities proposed by the SNA. The classification to be used for goods and services should be constructed with reference to this classification of activities. For this purpose, the United Nations proposes the CPC.

But these classifications cannot be used directly in all countries. They have to be adapted to the economic specificities of production and final uses in each county.

The implementation of these classifications remains a delicate task. Therefore, particular attention should be given to the following suggestions:

- Adopting a two-level classification of activities: Level 1 appears in the SUT's publication and may correspond to the divisions in the ISIC. Level 2 corresponds to a more detailed level of preparation of the production and income generation accounts.
- Guaranteeing the compatibility of these classifications with those adopted in the countries belonging to the same economic zone, for the sake of comparability.
- Adopting a three-level classification of goods and services: Any product that appears in a position of 1- and 2-digit levels is necessarily the main production of a single position at the same level of the activity classification (1 or 2).
- Ensuring the exhaustiveness of the locally adopted classifications and verifying that all

positions foreseen in the ISIC and CPC have been taken into account.
- Adopting locally significant elementary positions for these classifications, both from the point of view of production and importation, thus avoiding possibly empty positions.
- Taking into account productive chains that have significant local presence; the elementary positions chosen must allow their analysis.
- In countries where food and petroleum industries occupy a significant place, it is recommended to have more detail in 1-digit level positions.
- Globally, ISIC is recommended for the industry classification and CPC is recommended for the product classification. However, the level of detail will depend on the countries' statistical system.

2. Moroccan classification for SUTs

(a) **Industry classification:** The national account classification of industry used to produce SUTs is compatible with ISIC rev 3 as recommended, yet it distinguishes between market and non-market activities producing health and education services (annex 3). It includes 100 positions;

(b) **Product classification:** In general, products' classification is based on the following four criteria:
- The weight in the economy based on its importance in local production or imports.
- The need to retain homogeneous product groups (in regard to VAT ratio, production process…).
- The availability of statistical data sources.
- Time and workload.

Taking into account these criteria, the Moroccan national account classification of products used in SUT presents 278 items (annex 4).

3. Bridge tables for product

Bridge tables must be created to provide a link between the national account classification of products and the detailed goods classification (HS-groups) used for foreign trade statistics. The available bridge tables on the UNSD website can be used as a base to establish the link between different classifications, but as every country has its own classification used for the compilation of SUT, bridge tables must be examined and adapted to the national classifications.

Bridge tables must also be established to define the relationship between the national account classification of product and the codes used in different types of economic surveys, other accounting or production statistics and Government finance statistics. At the same time, a bridge table linking the COICOP used in the surveys on household expenditure and the classification used for products in SUT must be established.

4. Recommendations on classifications used in SUTs

Before starting the production of SUTs, and in order to decide on the classification to be used, it is recommended to:

- Set up an SUT user group, which includes key users of SUTs, to identify the main uses of the data and inform future developmental work.
- Consult with potential users in order to examine the scope and detail of the SUT and to support economic statistics by taking

a view on which socio-economic and financial policies have to be informed by the structural economic statistics, including SUTs.
- Take full account of users' views in publishing SUTs.

Ultimately, the selected classification and its details depend on national demands for specific detail, available details in national data sources and requirements of reliability. However, a close link to international classifications is important to allow international comparison.

At its thirty-seventh session, the United Nations Statistical Commission recommended that countries adapt their national classifications in a way that allows them to report data at least at the two-digit level of ISIC, Rev.4 without loss of information.

For the elaboration of SUTs, the intermediate-level SNA/ISIC aggregation proposed in the new version of ISIC can be a suitable classification for industries (annex 3).

C. Construction of the initial domestic table

The compilation of SUTs can be broken down into five broad stages:

- Compiling the initial supply table: domestic production and valuation vectors.
- Constraining the column of foreign trade: imports (supply) and exports (use).
- Creating the initial use table (IC and domestic final uses).
- Constructing the gross value-added quadrant.
- Balancing tables.

1. An example of a supply table- Morocco 2007

Supply table					Domestic production by industry						
Product	Total supply at purchasers' price	Trade margins	Transport margins	Taxes less subsidies on products	Agriculture	Manufacturing	Trade and repair	Other services	Total domestic production	c.i.f. Imports	c.i.f./f.o.b. adjustment
Agriculture	154 788	18 497	863	5 486	109 314	4	0	9	110 137	19 805	
Manufactured products	851 418	66 046	5 896	42 429	5 008	480 412	7 669	1 187	494 276	242 771	0
Trade and repair	8 476	-84 543	0	1 022	22	5 441	84 734	1 800	91 997	0	
Other services	412 258	0	-6 759	21 974	63	6 547	4 084	371 818	382 512	35 010	-20 479

Supply table					Domestic production by industry						
Product	Total supply at purchasers' price	Trade margins	Transport margins	Taxes less subsidies on products	Agriculture	Manufacturing	Trade and repair	Other services	Total domestic production	c.i.f. Imports	c.i.f./f.o.b. adjustment
c.i.f./f.o.b. adjustment						0			0	-20 479	20 479
Direct purchases abroad by residents	7 614					0			0	7 614	
Total	1 434 554	0	0	70 911	114 407	493 214	96 487	374 814	1 078 922	284 721	0

The process itself is neither straightforward nor linear. Problems may come to light at a later stage in the process which requires revisiting of earlier stages. More fundamentally, significant changes made during the balancing process may cause the tables to be inconsistent with the tax, margin and subsidy figures estimated. An iterative process of re-estimation and rebalancing is therefore applied until the tables converge to a consistent and balanced final estimate.

The purpose of the supply table is to show the goods and services produced by each industry along with the supply of goods and services including imports.

2. Domestic production

It is a matrix with commodities in the rows and industries ("kinds of activities") in the columns.

This matrix is the main part of the supply table. It shows the output of the industry (at basic prices) by type of goods and services. Each column includes the output of primary and secondary productions and its total refers to the industry's output. This matrix allows the passage between the production of industries and that of products, the total by rows refers to the output of a group of commodities by all resident industries.

In the case where the accounting data from the enterprises (these data refer to the enterprise and its establishments one by one) are the main data sources used for producing the domestic production matrix, complementary information on sales by product may be needed. In some industries, one or a few companies are the main players on the market. In this case, it will be helpful for the national accountant to obtain

certain additional information concerning their sales and costs structure.

3. Moroccan methodology for producing the domestic production matrix

The population of domestic matrix products refers to a lot of data sources, mainly:

- Structural survey on organised companies (with official accounting) acting in fishing, mining, energy, manufacturing, construction, trade and non-financial market services.
- Informal sector survey (non-farm production units).
- Survey on the government's investment.
- Agricultural surveys (on crops and livestock).
- General state budget.
- Administrative accounts of local authorities.
- Accounting documents of public institutions and companies.

All these sources were used to enable the construction of the domestic production matrix including:

- Principal and secondary production (primary activity of an industry is reported on the diagonal of the matrix).
- Market output, output produced for own final use and other non-market output.
- Formal and informal production.

Box 5. Livestock production in Moroccan national accounts

The calculation of output is done through the balance of the product by livestock categories using the data available through the annual survey on livestock carried out by the Ministry of Agriculture:

Production = Intermediate consumption
+ Final consumption
+ GFCF
+ Inventory change
+ Exports
– Imports

Assumptions retained by type of animals:

1. GFCF and change in inventories

1.1 Cattle

TC: Total number of cattle
CO3: Number of cattle aged over 3 years
CL3: Number of cattle aged less than 3 years

CO3 (at the end of the year) – CO3 (at the beginning of the year) = Cattle intended to GFCF
CL3 (at the end of the year) – CL3 (at the beginning of the year) = Cattle intended for the change in inventories

1.2 Sheep

TS: Total number of sheep
SO2: Number of sheep aged over 2 years
SL2: Number of sheep aged less than 2 years

SO2 (at the end of the year) – SO2 (at the beginning of the year) = sheep intended to GFCF
SL2 (at the end of the year) – SL2 (at the beginning of the year) = sheep number corresponding to the change in inventories

1.3 Goats

TG: Total number of goats
GO2: Number of goats aged over 2 years
GL2: Number of goats aged less than 2 years

GO2 (at the end of the year) – GO2 (at the beginning of the year): goats intended for the GFCF
GL2 (at the end of the year) – GL2 (at the beginning of the year): goats intended for the change in inventories

The source used is the livestock survey which is carried out each crop year during two periods of time, the first in October – November and the second in March – April of the following calendar year. Appropriate prices or price indexes are used to move from numbers to value.

2. Intermediate consumption

It corresponds to controlled slaughter (from the Ministry of Agriculture) and uncontrolled slaughter for informal market production of meat.

3. Final consumption

It corresponds to the consumption of livestock for Eid Al Adha and other social occasions (Survey on household final consumption).

D. The valuation vectors

As the total supply of goods and services is valued at basic prices, the valuation vectors of trade and transport margins and taxes less subsidies on products are added to total supply at basic prices to move to the total supply at purchasers' prices.

1. Trade margins

Most users do not buy products directly from their producers. Wholesalers and retailers offer their services to guarantee distribution, supplying a product after adding a margin to the price received by the producer.

From the point of view of wholesalers and retailers, the margins are analysed as a production that requires specific measurement: it is the difference that is observed at the time of sale between the purchaser's price and the sale price of the marketed product. According to this definition, the margin charged by wholesalers or retailers is an element of the purchaser's price, which is added to the basic price received by the producer of the good.

Ensuring the coherence of the different valuation elements requires that the following elements be taken into account:

- The sale price that must be considered is the one that is actually applied, even when it is lower than the purchaser's price.
- Any product purchased by a trader that does not appear in its inventory should be considered as sold, possibly at a zero price if it has been lost.
- The trade margin includes all transport services paid to third parties (which are then part of the intermediate consumption of the merchants).
- The production of trade is valued at basic prices, that is, without any taxes levied on products at the level of trade.

(a) Data sources

Estimates on trade margins by product earned by wholesalers and retailers should be collected via business surveys. Surveys on commercial establishments are sometimes available, but in general, they only cover large establishments, and even then their coverage can be defective. However, except in case of extreme insufficiency, such surveys can be used as an indicator of the margins applied by the different types of businesses (wholesalers or retailers). The amounts of margins charged can only be estimated when the source is sufficiently exhaustive. Estimations should be done in conjunction with the measurement of the changes in inventory of goods held for sale.

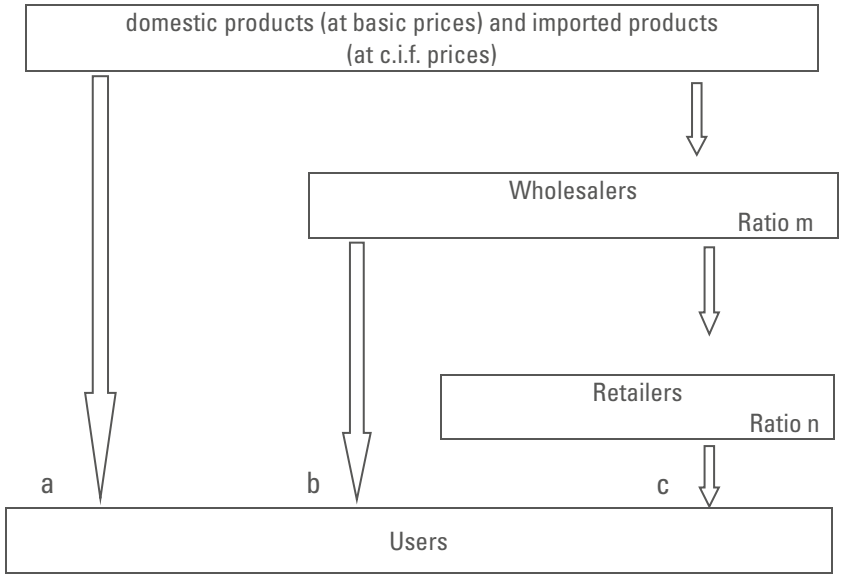
Consultation with experts is very useful to determine commercial practices according to the different types of products, the categories of shops and the nature of the customers: experts in professional unions, chambers of commerce and industrial traders may provide useful information that can help to understand the economic phenomena and the relationships between different actors and thus to estimate trade margins in different type of trade.

(b) Estimation of the trade margin by product using margin's ratio

For each product, we propose to analyse the distribution chain from the producer to the user through the trade activity and to calculate the product margin's ratio.

Same product can pass successively through several traders, for example a wholesaler and a retailer. In this case, the total margin charged corresponds to the sum of the margins charged by each of them. But at the same time, another part of that product can be acquired directly by the user from the producer (which in particular happens with the IC or the GFCF). In this case, there are no trade margins.

For a given product, if we know the proportion of product that users buy directly from the producers (a) and the proportion of product purchased from wholesalers (b) and from retailers (c), the flows can be described by a scheme similar to the following:



a, b and c are percentages that represent the proportion of the flows of the product through the three possible itineraries, measured with reference to the supply of basic value of offer: a + b + c = 100%

The m and n rates are the margin ratios of wholesalers and retailers. The average ratio margin M is then calculated using the formula:

$$M = \frac{1}{100} * (b.m + c.m + c.n + \frac{c.m.n}{100})$$

The trade margin, for each product, can be estimated by multiplying the average ratio calculated from the formula above by the total supply of this product at basic prices (domestic output and c.i.f. imports). The results obtained by product must be checked with the total of trade margins by industry. The differences are then analysed and, based on the information available, adequate adjustments must be operated.

Box 6. Trade margin by use using margin ratios; an example:

The supply of a product D is equal to 400, knowing that 10 per cent (a) of D is bought directly from the producer or importer, 20 per cent (b) is purchased from wholesalers who apply a margin ratio of 5 per cent (m), and 70 per cent (c) is purchased from retailers who make a margin of 20 per cent. (n). (a + b + c = 100%).

The margin through this channel of distribution will be:

(1) Directly from producers and importers = 0
(2) From wholesalers: 400 * 20% * 5% = 4
(3) From retailers:
- 70 per cent of D (280) pass through wholesalers who apply a margin ratio of 5 per cent, making 400 * 70% * 5% = 14 as margin

- They will sell the product to retailers at (280 + 14)
- Retailers will apply the margin ratio of 20 per cent on their purchases from wholesalers, thus their margin will be: (280 + 14) * 20% = 58,8

Total trade margin = 4 + 14 + 58,8 = 76,8
M = 1/100 * (20 * 5 + 70 * 5 + 70 * 20 + 70 * 5 * 20/100) = 19,8

Using this average ratio, the total trade margin collected will be = 400 * 19,8/100 = 76,8

(c) Moroccan methodology for estimating the trade margin by product

(i) Introduction

The trade margin realised by a commercial activity is measured as the difference between the actual or imputed price realised on a good purchased for resale (either wholesale or retail) and the price that would have to be paid by the distributor to replace the good at the time it is sold or otherwise disposed of.

The calculation of trade margin can be done:

- Directly using data relating to sales and purchases of products for resale.
- Or indirectly using the margin ratios.

$$margin\ ratio = \left(\frac{sales - (purchases - Change\ in\ merchandise's\ inventory)}{(purchases - Change\ in\ merchandise's\ inventory}\right)$$

Globally, the trade margin can be calculated directly by the **relation (1):**

TM = S- (P-VS)
With
TM = trade margin
S = total sales
P = total purchases
VS = change in merchandise's inventory

(ii) Data sources

The main sources used to approach the trade margins are:

- Structural surveys on commercial enterprises (formal Sector).
- National survey on informal sector (trade activity).

(iii) Methodology

The trade margin is the revenue realised on goods purchased for resale, minus cost of purchased products for trade. The methodology adopted in Moroccan national accounts distinguishes between margins realised in informal trade activity and those realised by organised enterprises.

(a) Organised enterprises

The structural survey on commercial enterprises allows an estimation of the trade margins earned by the organised enterprises acting in trade activity (wholesalers and retailers).

The following table presents the questions relating to the trading activity:

Product	Total sales		Average margin ratio (percentage)	Total purchases		Initial stock	Final stock
	Value excluding VAT	VAT		Value excluding VAT	VAT	Value excluding VAT	Value excluding VAT
A-good for resale	.....	.....	.....	.....	.....	.....	.....
A.1- wholesales	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....
.....							
.....							
Subtotal 1	.....	.....	.....	.....	.....	.....	.....
A.1- Retails	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....
.....							
Subtotal 2	.....	.....	.....	.....	.....	.....	.....
B- Intermediation activity (commissions received)							
C- Sale of services	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....
.....							
Subtotal 3	.....		.....	.....	.....	.....	.....
D- Manufactured Products	.....		.....	.....	.....	.....	.....
.....	.....		.....	.....	.....	.....	.....
.....							
Subtotal 4	.....		.....	.....	.....	.....	.....
Total	.....		.....	.....	.....	.....	.....

The direct method is applied to calculate the total margins by enterprise, after correcting the change in inventories by moving their value from accounting stocks to economic stocks.

Since changes in inventories are not always reported by product, we use the margin ratios reported by the units surveyed, as illustrated below.

Analytical illustration

Calculation of the margin (M) for each company by product using the reported ratios:

$$\mathbf{M} = \sum \mathrm{Si} * \mathrm{Ti}$$

With
Si = product i sales
Ti = TMRi /(1 + TMRi)
TMRi = the declared trade margin ratio on product i

Using the **relation (1)**, the total trade margins by company (**M'**) can be calculated as below:

$$M' = S - (P - VS)$$

With
S: Total sales of the company
P: Total purchases of the company
VS: Change in merchandise's inventory of the company

The structure of trade margins by product calculated from the reported ratios (**M**) is used to break down the margins trade (**M '**) calculated according to **relation (1)**.

The structure of (**M**) by product is used to distribute the change in merchandise's inventory of the organised companies acting in trade industry.

(b) Informal commercial units

The national survey on the informal sector provides detailed data about sales and purchases realised by informal commercial units. In the informal sector, the change in inventories was assumed to be negligible. Therefore, it was not observed in the survey.

The relevant part in the survey's questionnaire for the estimation of the trade margin by product is the table below concerning the trade activity:

N	Product	Product's Code	Period	Unit	Quantity	Sale unit price	Turnover last month	Purchase unit price	Total expense last month
1	.....	□□□□□□	.....		.....	.....	.....	.....	.....
2	.....	□□□□□□	.....		.....	.....	.....	.....	.....
3	.....	□□□□□□	.....		.....	.....	.....	.....	.....
4	.....	□□□□□□	.....		.....	.....	.....	.....	.....
5	.....	□□□□□□	.....		.....	.....	.....	.....	.....
6	.....	□□□□□□	.....		.....	.....	.....	.....	.....
7	.....	□□□□□□	.....		.....	.....	.....	.....	.....
8	.....	□□□□□□	.....		.....	.....	.....	.....	.....
...		□□□□□□	.....		.....	.....	.....	.....	.....

As the change in inventories is supposed to be negligible, estimation of the trade margin by product earned by the informal commercial units is based on the **relation (1)** with no change in inventories.

TMi = Si- Pi

With

TMi = trade margin on the product i

Si = total sales of the product i

Pi = total purchases of the product i

(c) Secondary commercial activities

As trading is an important secondary activity of nearly all industries, the estimation of the global trade margin involves the estimation of the trade margin earned by other industries (non-commercial) as part of their secondary outputs.

The structural surveys carried out by HCP provide the sales and expenses of products purchased for resale by non-commercial enterprises.

The two tables below present the questions relating to the trading as secondary activity:

Sales side: Establishment's sales (turnover)

Production and sales

Enterprise's Product	Code		physical unit	Domestic sales				Sales abroad		
				Qty	Value excluding VAT		(**) Percentage	Total		Exportation taxes
					Total	invoiced VAT		Qty	Value	
Goods for resale	04									
Subtotal 2	05									

(**) Part of sales to domestic non-commercial enterprises

Purchases side: Cost of purchased good for resale

Purchase of raw materials and consumable products

Product	Code		Physical unit	Expenses excluding recoverable VAT		Recoverable VAT	Invoiced VAT	Initial stock		Final stock	
				Qty	Value			Qty	V	Qty	V
II- Goods for resale	09										
Subtotal 5	10										

The trade margin is calculated as the difference between the establishment's merchandises sales and the cost of their acquirement. The data available through the survey on structures allow us to use the **relation (1)** in order to estimate the trade margin of non-commercial enterprises broken down by type of product.

(d) Calculation of the total trade margin by product

To obtain the total trade margin by product, it is sufficient to combine the trade margins obtained for the three previous cases by product. The margin relating to the actual production of the commercial activity (wholesalers' and retailers' output) is limited to the sum of margins calculated by product in the first two cases.

(e) Adjustment of trade margins in SUT

The trade margins are added to move supply from basic to purchasers' price, but the value of uses (which are at purchasers' price) already includes the trade margin, therefore this output has no intermediate neither final use. To avoid double counting this output, its value must be cancelled out by negative entries in the cell of trade product of the trade margin vector.

2. Transport margins

(a) Introduction

Transport margins are costs incurred for the transportation of products. They are paid separately by the purchaser and included in the use of products at purchasers' prices but not in the basic price of a manufacturers' output or in the trade margins of wholesalers or retailers.

The transport margins refer only to goods, due to their material condition: economically speaking, identical goods located in two different places are considered as different, since the fact of transporting them involves a cost, which is specified in the production of a service. In fact, transport brings a change in the characteristics of the good. In addition, and most of the time, the place of use of a good differs from its place of production.

Consequently, in the SNA, the margin of transport does not include:

- Transport services that institutional sectors carry out on their own account since transport is part of the ancillary services.
- Transport services initially financed by producers, when the cost of that service is not invoiced to purchasers.

Therefore, only market transport services, paid to third parties on purchased inputs by the producing units, are taken into account in the transport margin. This necessarily includes the transportation of imported goods for the part of the route within the national territory.

This concept refers only to the transport services of purchases paid by users to other parties. These amounts represent just a part of the transport service of goods, which are even lower than the set of costs related to that transport (since the part that is considered as an ancillary service and is carried out by specific parties on their own account, is not accounted for as production).

The ability to determine the margins of transport depends on information that comes from users: what they have paid for the transportation services of their purchases.

This information is excluded for the case of exports. Instead, it is conceivable for ICs and GFCF. In the latter case, these expenses do not represent a specific intermediate consumption, but must be incorporated into the purchase prices of their intermediate consumption of goods. If only the global amount of these expenditures is specified, they will have to be distributed among the goods, theoretically pro rata of the tons/kilometre travelled. In practice, and leaving aside the particular cases that have a significant weight, they will be distributed as pro rata of global values.

However, it is highly probable that this type of information is not available in many cases. The amount that will be assigned to the margins of transport can only be determined when considering a part of the transport production dedicated to the transfer of the goods linked to a particular commodity balance.

But then a prior question arises: to know how much is raised for each group of goods the production of the transport destined to them. This is something that could be obtained by disaggregating for each of these groups the total amount of the production of the transport service known from surveys of establishments that provide transportation services.

It may be desirable to try to assess the services of freight transport using two approaches. The first approach uses the information available regarding the means of transport (i.e. the vehicle fleet). The point of view adopted is also that of the "transport" industry, regardless of the products transported. The second approach is based on the need to transport the products.

It is also possible to make a measurement using physical magnitudes. Usually the concept of tons/kilometres is used, to which a notion of price is associated: the cost of freight per ton/kilometre, depending on the vector used. Unlike what happens with trade, the notion of rate does not apply here.

Nevertheless, only part of this transport results in a production: it is carried out on behalf of third parties (excluding the one made by own account).

In the case of heavy infrastructure (roads, air or sea transport, pipelines), its management is usually handled by large companies. Therefore, it is easier to have statistical data, including the amount of production and sometimes even the disaggregation of income by product (or the quantities transported). In this type of transport, some of which are very specialized, it is easier to associate them with the transported products. The situation is much more difficult in the case of road freight transport. In effect, this activity is exercised most of the time by small companies and even by individual entrepreneurs owning a single vehicle.

In transport related to heavy infrastructure, it is usually possible to analyse by product, otherwise, the situation would be identical to that of transport carter. In the latter, it is only possible to analyse the needs of transportation by product after deducting the part that was eventually made by the specialized transports, but this analysis generally does not allow the distinction between transport on own account and on behalf of third parties. According to the information on registrations, the focus of the automotive fleet can allow this distinction, but only for all the products as a whole. For this type of distribution, information is only available from an eventual survey of establishments or companies.

For the analysis of transport needs by product, the work must refer to the tons that will be transported and the average distances that will be covered (we can distinguish between the local transport of production, long distance transport, and proximity transport for local distribution). And if possible, an evaluation of the transport value associated with a product and hypotheses can be made about transportation on behalf of third parties and what refers to the margins of transport.

(b) Data sources

Statistical sources related to transportation are listed below:

- Surveys of transport establishments or companies.
- Statistical or administrative data on specialized transport.
- The vehicle fleet, especially if there is a special administrative procedure in relation to the carriers.
- The data on road traffic in some axes, including eventually, transportation within the whole country.
- Controls and other administrative formalities relating to the transport of goods (road map for the police or the tax office, weight control, customs, etc.).
- The tonnage of the products to be transported (taking into account their place of production, import and use).
- Freight prices per kilometre (differentiated according to distance to travel or the quality of the coatings).

Adjustment for transports margin in SUT

To avoid double counting of transport margins, as an element for moving from basic to purchasers' prices and as an output of transporting services industry, their value must be cancelled out by negative entries in the cell of product transport of the transport margin vector.

Box 7. Eurostat transport margins from supply side

Starting from the supply side involves firstly the identification of the transport services added on to goods in the different industries. But not all these transport services will be regarded as transport margins for the following reasons: there are transport services on goods not considered as products in the system such as the transport of used goods (including removal services), scrap and waste, earth and similar goods in relation to construction projects. A second reason relates to transit transport where a domestic carrier transports goods from a foreign country A to a foreign country B. Thirdly, all transportation outside the domestic territory in connection with imports and exports of goods are to be considered as transport services, but not as transport margins. Only those transport services that contribute to the difference between the supply of products at basic prices and the use of products at purchasers' prices are to be treated as transport margins.

Furthermore, according to ESA 1995 definitions, the transport margins are given even less coverage compared to the old system since transport costs are only part of the purchasers' price if the purchaser must pay for them separately.

If the seller pays for the transportation and does not invoice it to the buyer separately, these transportation costs must be shown as part of the intermediate consumption of the seller. Thus, only in the case that the seller arranges for the transportation and invoices it to the purchaser separately, these transportation costs form part of the difference between supply at basic prices and use at purchasers' prices and are thus to be entered in the transport margins matrices.

It would have to be explored whether the separate invoicing of transportation costs by the seller is of great importance. For simplicity, one could argue that in reality these cases are of less importance and conclude that there are no transport margins at all.

If this extreme assumption were not applied, the calculation of the transport margins according to the ESA 1995 would be a complicated task. From the supply side alone, it would be impossible to distinguish between transport services paid for by the seller and relevant transport services invoiced to the purchaser. Starting from the output of transport services in the different industries, only the total transport service can be calculated. The amount that should be deducted from this total output includes the following: the transport revenues related to transit transport, transport outside domestic territory, transport revenues related to freight not considered as products, and last but not least, transport revenues paid for by the seller not invoiced separately and those directly paid for by the purchaser. Then, the resulting transport margins must be subdivided by products and by mode of transport.

Usually, information on freight transportation revenues not to be considered as transport margins, as well as information on products transported, is not available in monetary terms. Structural business statistics will only provide us with total revenue data. One possibility is to make use of transportation statistics which normally survey transportation activities in physical terms by providing data on the transport distance, whether domestic, cross-border or transit transport, the transport volume in terms of weight and tonne-kilometres and the kinds of goods transported. Transportation statistics may also cover all the different modes of transport (road, railway, water, air, and pipeline).

(c) Moroccan methodology for estimating the transport margins by product

Transport margins represent freight transportation services of products when invoiced separately by the seller. They are one element of valuation needed to bring the supply from the basic prices to purchasers' prices.

(d) Data Sources

The main sources used for the valuation of these margins come mainly from:

- Structural surveys on non-financial enterprises (formal sector).
- National survey on informal sector (trade activity).

These enterprises engage in the following activities:

- Manufacturing industries
- Fishing
- Mining and quarrying
- Energy
- Construction
- Trade
- Non-financial market services.

Due to lack of information on the agricultural and public administration sectors, the

transport margins associated with the acquisition of transported goods will not be taken into account in this study. The corresponding transport costs are not invoiced separately and are taken into account in intermediate consumption on transport service.

(i) Enterprises in the formal sector

The structure surveys are carried out on the organized enterprises. They provide information on transport costs related to purchases and sales made by the enterprise by means of transportation as seen below:

V. Costs of transportation of goods				
Type of transport	Code	Amount in Dirham		
		On sales	On purchases	Total
Road transport	01	.....	.....	.....
Rail transport	02	.....	.....	.....
Other transportation	03	.....	.....	.....
Total	04	.....	.....	.....

Transportation costs on business' purchases are billed separately from the prices of the acquired products. They correspond to the transport margins paid on the transport of these products. Establishments show these costs separately in their accounts, meaning that they do not count them in the value of their purchases. Therefore, the fees paid correspond to all purchases whatever the nature of these products (product code). It would then be necessary to break down the transport margins retained per product according to the most detailed level of the product classification used in the SUT.

This breakdown is made in proportion to the companies' purchases by product classified by kind of transportable product. The transportation costs on sold products are costs borne by the company and assumed not invoiced separately to the acquirers (therefore they are part of the basic price) and considered as the producer's intermediate consumption in transport service.

(ii) Informal units

The national survey of the informal sector provides information on the cost of transportation borne by the informal units for goods sold (unit's output) and goods purchased (unit's IC or GFCF) in the "Total expenses" module.

Expense	Period	Expense's code	Period code	Value in Dirham	Origin
Transportation of purchased products	Month	12	4		
Transportation of sold goods	Month	13	4		

The cost of transportation of the purchased goods by informal units is assumed to be invoiced separately thus it corresponds to transport margins. However, the cost of transportation of the goods sold by informal units to purchasers is assumed to be an intermediate consumption on transport service.

(e) Transport margins by product: Methodology

The data available through the structural surveys and the survey on informal sector allow the estimation of transport margins (costs borne by the surveyed company undertaking activities in different industries) by purchasers which are classified according to the national accounts classification of industry used in SUT.

To compile the transport margin vector, we need to move from the transport margin by industry to the transport margin by product and to add this margin to the purchases of industries on the transported goods (the basic data from surveys does not include this cost in the purchaser's price of the acquired commodity).

The calculation of the transport margin by product requires:

- Establishing the matrix of purchases of goods likely to be transported (locally produced or imported) by industry and by products (SUT classifications), not including the purchases of the energy (of which the corresponding transport costs are not invoiced separately): Xij purchase of industry j on products i.
- Calculating the transport cost vector (using the data of the surveys on formal and informal sectors): TrM.j transport margins in the industry j.
- Breaking down the transport costs of each industry by product according to the structure of the matrix of purchases of transportable products.
- Obtaining a matrix (product in row, branch in column (TrMij)) which represents the transport margins by product and by branch.
- Adding the amount of the transport costs of the branch j in product i, to the purchases of the industry in products i to pass to the purchasers' prices. Since companies report transport costs in the survey, it can be assumed that they have been able to record these expenses based on separate invoicing of transport expenditure which they do not report in the price of purchased product.
- Taking the total per row of the transport cost of purchase matrix as the transport margin at the product level. The resulting transport margins are analysed and compared to the output of the freight transport sector. Their total must be less than the output of the freight transport sector.

The breakdown of TrM.j according to the products purchased by branch j is based on the following proportional method:

$$TrMij = Xij / X.j * TrM.j$$

And the transport margins on product i (TrMi.) are calculated by the equation:

$$TrMi. = \sum_j TrMij$$

In final, the purchaser price of product i acquired by the industry j (X'ij) will be:

$$X'ij=Xij+TrMij$$

Purchasing transport costs concern products transported for intermediate consumption or GFCF purposes.

Example

The surveys allow to obtain the M.j vector below:

	Agriculture	Mining and quarrying	Manufacturing	Electricity, gas and water	Construction	Trade and repair	Other services	Total
TrM.j	0	6	120	14	56	36	232	464

And the detailed purchases by industry on transportable goods Xij:

Xij	Agriculture	Mining and quarrying	Manufacturing	Electricity, gas and water	Construction	Trade and repair	Other services	Total
Agriculture product	198	0	584	0	0	14	796	1 593
Mining products	0	4	394	43	30	1	472	944
Manufactured products	187	33	1 461	33	482	185	2 381	4 762
Total industry	385	37	2 439	76	513	200	3 649	7 299

Using the structure of the industries purchases by goods, it is possible to break down the transport margins TrM.j on kinds of products ⟹ TrMij.

The last vector refers to the transport margins by product TrMi:

TrMij	Agriculture	Mining and quarrying	Manufacturing	Electricity gas and water	Construction	Trade and repair	Other services	TrMi.
Agriculture product	0	0	29	0	0	2	51	82
Mining products	0	1	19	8	3	0	30	61
Manufactured products	0	5	72	6	53	33	151	321
Total industry	0	6	120	14	56	36	232	464

By adding the transport margins TrMij to the initial purchases by industry, it is possible to estimate the purchasers' prices of transportable goods by industry X'ij.

X'ij	Agriculture	Mining and quarrying	Manufacturing	Electricity, gas and water	Construction	Trade and repair	Other services	Total
Agriculture product	198	0	613	0	0	17	847	1 675
Mining products	0	5	413	51	33	1	502	1 005
Manufactured products	187	38	1 533	39	535	218	2 532	5 083
Total industry	385	43	2 559	90	569	236	3 881	7 763

Box 8. Transport cost in Moroccan commercial accounting code

Moroccan companies report transport costs on:

- Purchases: on the Item 61425
- Sales: on the Item 61426
  The accounting treatment of transport costs is quite diversified, because it is up to the supplier to specify the terms of transport, depending on the sales conditions.

1. Free transportation: The transportation is free when it is not charged to the customer. The invoice can then be marked "Free of charge" or "Free port". This does not mean that the sales price is not calculated to cover transport costs, because the supplier can charge the cost of transport over the price of the goods indirectly.

Example: The producer manufactures a good A worth 90 at the basic price and sends a carrier B to deliver the product to a customer C, at 10 (transport cost)

Customer's accounting

Item	Wording	Value
61425	Transportation on purchases	0
61XX	Purchases	100

Transport cost is not separately invoiced, thus it is included in the basic price and it is a supplier's IC.

2. Inclusive shipping: The goods are delivered by the seller using his own means. He then charges a lump sum since it is difficult to accurately calculate a priori the cost of each delivery.

Transcription in the client's accounts: Transport costs are not recorded on a specific account, they are included on the purchase price of goods.

Example: The producer manufactures a good A worth 90 and uses his own means to deliver the good to C. He charges C a transport cost worth 10.

Customer's accounting

Item	Wording	Value
61425	Transportation on purchases	0
61XX	Purchases	100

The cost of transportation (10) is a transport margin which is recorded in the output value (= C's purchases).

3. Transport disbursed: Transport is disbursed when the seller (product's producer) bills the buyer for shipping costs paid to a carrier on behalf of the buyer.

Customer's accounting

Item	Wording	Value
61425	Transportation on purchases	10
61XX	Purchases	90

Item 61425 refers to a transport margin but it is not included in the purchases' price.

4. Transportation due: In this case, the transport costs are not included in the supplier's invoice. The customer himself uses a transport company to collect the purchased goods or materials.

Transport cost is not a transport margin, it is a customer's IC.

Example: The producer manufactures a good A worth 90 at the basic price and sends a carrier B to deliver the product to a customer C, at 10 (transport cost), which is invoiced to the customer.

Customer's accounting:

Item	Wording	Value
61425	Transportation on purchases	10
61XX	Purchases	90

3. Taxes and subsidies on products

(a) Taxes on products (D.21): general overview

A tax on a product is a tax that is payable per unit of some good or service. The tax may be a specific amount of money per unit of a good or service, or it may be calculated ad valorem, as a specified percentage of the price or value of the goods or services transacted. A tax on a product usually becomes payable when it is produced, sold or imported, but it may also become payable in other circumstances, such as when a good is exported, leased, transferred, delivered or used for own consumption or own capital formation.

Three types can be distinguished:

- Value added taxes (VAT)
- Taxes on imports
- Other taxes on products.

(b) Subsidies on products (D.31): general overview

Subsidies on product are defined as current unrequited payments made by the Government with the objective of influencing their levels of production or their prices. They may be calculated per unit, ad valorem or based on the difference between a specified target price and the market price. By convention, subsidies on products only apply to market output or output for own final use, not to 'other non-market' output.

(i) Description

The taxes and subsidies on products are all linked to the amount or value of market goods and services produced or sold.

Three major varieties can be distinguished:

- Taxes accrued at the time of circulation of the products: These taxes affect the sale of goods and services or their transportation, often with rates based on the value. In some cases, such as VAT, some buyers can deduct it.
- Taxes or specific subsidies on certain products: Taxes on tobacco, petroleum products, shows, etc; subsidies for basic necessities.
- Taxes or subsidies on exports: Exports are often exempt from previous taxes. Nevertheless, they may be affected by special taxes (in particular, on expensive raw materials); or there may be subsidies to promote them.

(ii) The sources

The amount of these taxes and subsidies is provided by the Government. Therefore, no statistical bias should be considered in relation to these amounts. On the other hand, time lags may occur. There is a great variety of taxes and each one has specific rules regarding its taxable base, payment, exceptions, possibility of being deducted, etc. It is not enough, then, to know only the amount but all the modalities in details, because most of the time this will be the only information that will be counted to distribute the total per product. The applied rates must be considered as information that must necessarily be collected, with the precise date of any change that affects them.

The available information sometimes includes a detail of the revenue per product. But caution should be exercised when handling this information (whose total is not necessarily equivalent to the amount of income checked in the budget). In addition, if it is a deductible tax, a part of the amount paid for a certain product is not included in the purchase price of the buyers who benefit from that deduction.

(iii) Specific taxes and subsidies

Knowing the rules of application, it is possible to know which products are involved (but they may not reflect the groups of the classification used in the national accounts), as well as the suppliers or recipients who are exempted or who enjoy differential rates. When it comes to taxes, an agreement on the amount should be reached without much difficulty. It is only necessary to verify to what extent this amount appears -or not- in the data provided by the companies, and in particular if it includes the value of the production.

The treatment is usually more difficult in the case of subsidies, at least when it is a public body that intervenes directly in the market of the products involved. In this case, subsidies may not appear as such in the budget documents, or may only appear in part, since the agency that manages them may intervene simultaneously in several products, even fulfilling specific commercial tasks (such as purchase, storage, transportation, conditioning or distribution).

(iv) Taxes and duties on imports

Customs statistics generally provide a detailed account of taxes by product and by nature, collected at the border. But the amount that is registered a priori is the total amount provided by the Government. In case of disagreement between sources about the amount, that difference must be interpreted. In particular, it is necessary to be sure about how the payment is made (with lags, subsequent deductions, possible payment with tax credits or other specific values that have been negatively recorded in other items, etc.).

(v) The specific case of VAT

Value added tax (VAT) is a percentage tax on products which is collected by enterprises. 'Invoiced VAT' is shown separately on the seller's invoice but it is not fully paid over to the Government as producers are allowed to withhold the amount ('deductible VAT') that they themselves have paid in VAT on goods and services purchased for their own use as intermediate consumption, gross fixed capital formation or for resale.

It should be noted that VAT paid by households for purposes of final consumption or fixed capital formation in dwellings is not deductible.

The interpretation of this tax is relatively delicate, and its consideration in the national accounts requires a specific treatment, but what is more complex is its valuation by product.

Its implementation is carried out in the following manner:

- The theoretical rate relative to each product of the classification is determined (when the group contains products that are affected by different rates, it may be a hybrid rate) for the current year (care must be taken with the rate changes that occur during the year).
- Transactions are determined in which VAT has not been invoiced (in general, exports, but also to some resident customers).
- Producers not subject to the VAT regime are determined (certain activities, some size thresholds, informal units, public bodies, NPISH, etc.).
- When VAT invoicing is carried out, the dispatches that give rise to a deduction must be distinguished from those for which the tax is definitively charged.
- In principle, non-market productions are not subject to VAT (since VAT only applies to sales).
- In general, VAT is charged definitively for the entire final consumption. However, the following exceptions should be considered:
- There is no VAT on the margins of the part marketed by informal units or not subject to the regime.
- There is also no VAT on the total amount of intermediate consumption and gross fixed capital formation related to informal producers, also on the part of the production of the formal producers under declared (tax fraud), or on what comes from smuggling.
- For simplicity, it could be agreed that stocks do not contain non-deductible VAT, as it is assumed that changes in inventories are negligible in informal sector and the companies that paid VAT can deduct their VAT paid on their purchases in stock.
- In intermediate consumptions and GFCF, buyers must be distinguished according to whether or not they can deduct VAT.
- Agricultural products present a particular situation: VAT in general is not billed by producers of agricultural products (farmers). It only appears when the product passes through a commercialization channel fiscally subject to VAT; and in case of direct purchase from agricultural producers by another producer, there is no non-deductible VAT.
- Based on these hypotheses, for each product and for each of the transactions involved, a theoretical VAT amount which is normally payable by buyers who are not entitled to the deduction is estimated.
- In order to carry out the work on non-deductible VAT, it may be useful to introduce two different columns, both for the IC and for the GFCF, specifying: “deductible VAT” and “billed VAT”.

We proceed then to the sum of those amounts theoretically paid, which shows a difference compared to the amount actually collected by the Government that we must try to make disappear, within the framework of the synthesis of the SUT. This procedure assumes that the rules governing this tax are studied carefully, prior to any valuation. Otherwise, there is a risk of having unpleasant surprises at the time of the final confrontation of the data.

Box 9. VAT and its treatment in national accounting

In principle, such tax affects all sales made by producers subject to VAT, apart from those destined for export. It is also charged (at customs, most of the time) on the value of all imported products. In return, these same producers can obtain the VAT refund that has affected all their purchases, including investments. Also, in principle, VAT is applied in the same way on the sales of merchants. In this case, it is applied to the margins, which raises the problem of sales made by small merchants that operate outside of fiscal control. In countries with a significant informal economy, it is usual to limit the VAT obligation only to productive units that exceed a certain size, or to those that pay the income tax based on accounting data. Some activities exercised mainly by small units (for example, in construction or retail) may also be exempt.

Certainly, multiple derogations can appear from one country to another, as well as the fact that the VAT that affects certain products (fuel, restaurant expenses, etc.) is not deductible nor invoiced when the sale is destined to specific client categories (public agencies, hospitals, military institutions, NGOs, etc.).

The company that is "subject to the VAT regime", in practice, is in a transparent situation in relation to this tax, since its actual costs are calculated net of tax, although it must be paid to its suppliers. That is why the accounting of companies is carried out without VAT (both in the case of sales and purchases). On the other hand, the company acts as the collecting agent of this tax on behalf of the Government. The consumer is the one who bears the VAT because he is not authorized to deduct it. This certainly includes the final consumer but also the intermediate consumer, or in other words, all the producers who are VAT invoiced and do not benefit from the deduction.

From a statistical point of view, the collection of the tax by the Treasury eventually supplies the amounts paid by the companies subject to the VAT regime. It is also possible to have, through the statistical treatment of the statements made by the companies, the amounts invoiced by these companies. But these two types of information do not provide information on the amounts actually borne by the buyers. Indeed, although the tax is really linked to the products (in particular through differentiated rates), its payment depends on the category of the buyer in relation to this tax, which is not statistically accessible (unless a relatively complex collection procedure was implemented, which is the case in very few countries).

Treatment adopted in the national accounts

VAT is part of the group of taxes that affect products. In this sense, it appears in the commodity balance, because it is one of the elements of the purchase price of the products. And it is added to the basic price for buyers not subject to the VAT regime. Nevertheless, it is not supported by:

- Buyers who can deduct it (the producers subject to the VAT regime, and only for products for which deduction is authorised).
- Buyers whom suppliers invoice without VAT (sales for export and buyers who enjoy a specific privilege).

(c) Moroccan methodology for estimating taxes and subsidies on products

Taxes on products can be broken down into:

- Import duties
- Non-deductible VAT
- Domestic consumption tax (DCT) and other taxes on products
- Subsidies on products.

Taxes and subsidies on products are estimated in total from the Government budget statistics, and from local government administrative accounts by kind of tax and subsidy. These need then to be allocated to products (278 items) to populate the supply and use framework.

(i) Import duties

Import duties are obtained directly from customs statistics which present these duties by production according to the Harmonized System (HS) classification. The bridge table between HS and the product's classification adopted in the SUT is used to produce the vector of import duties by product.

Box 10. Morocco, revenue from import duties by HS classification

Extract from 2017 customs' statistics

HS wording	HS code	Import duties (millions of Dirhams)
Raw cane sugar for refining	1701140010	778.2
Cigarettes containing tobacco	2402200000	277.1
New motor cars for transport, all terrain, load between 500 and …	8703103100	248.7
Other new motor cars, cylinder capacity not exceeding	8703325390	156.9
Other new motor cars, cylinder capacity not exceeding	8703324300	130.4
Motorcycles, cylinder capacity not exceeding 50 cm^3	8711101100	66
Motor cars, cylinder capacity exceeding 2500 cm^3	8703338390	17.5
Telephone sets, including smartphones and other telephones for cellular networks or for other wireless networks	8517120090	79.1
Other coal	2701190000	68.9
Other footwear with outer sole of rubber	6404199090	47.4
Other fabrics, synthetic textile fibres	6001929919	39.9
Maize (excluding seed for sowing)	1005900000	80.2
Other motor vehicles for the transport of goods, used	8704219952	60.6
Durum wheat, from 1st to 31st August	1001190090	65.7
Cotton t-shirts	6109100010	33.8
Combined refrigerator-freezers for domestic use weight<500kg	8418100019	17.4
Electrical energy	2716000000	82.4
Combined refrigerator-freezers for domestic use	8418100011	19.2
Compression-ignition internal combustion piston engine	8408202100	34.4
Men's or boys' cotton trousers	6203420020	27.5

Source: Administration of Customs and Indirect Taxes, Integrated customs statistics.

(ii) Value Added Tax

Value Added Tax (VAT) is an indirect tax that can be deducted by the companies with official accounting. Households as consumers and informal units that are not registered in VAT system are not allowed to deduct their VAT. This tax covers most goods and services, and for each product in the SUT, the amount of VAT entered corresponds to the part that has not been deducted by the various economic agents whether they are subject to it or not. This amount can be subdivided into two categories:

- Total VAT invoiced on households' purchases and other clients not subject to VAT.
- The part of VAT not recovered by companies that are subject to VAT.

VAT is paid at the time of purchase or acquisition of each product regardless of its destination, intermediate consumption, domestic final consumption or gross capital formation. Exports are in principle exempt from this tax. Companies subject to VAT are supposed to recover the VAT they paid on the purchased products whether they are intended for their intermediate consumption or their GFCF.

Thus, the value of the non-deductible VAT is estimated by product according to the type of demand of the economic agents. The value of non-deductible VAT on products used as an intermediate consumption or as GFCF by the companies subject to VAT (formal enterprises) is calculated directly from the results of the structure surveys, as part of the surveys questionnaire that is reserved for questions related to each product asking about the amount of VAT invoiced and the amount recovered.

For the productive sectors (merchant and non-market) not subject to VAT, the amounts of VAT included in the expenditure made for the acquisition of various products intended for intermediate consumption or GFCF are calculated based on the regulations in force. An identical calculation method is used for household final consumption and their gross fixed capital formation (especially dwelling). The relevant equation used is:

VAT accrued = Expenditure at purchasers' prices * VAT rate/ (1 + VAT rate)

With

Expenditures concern IC, FC and GFCF (not produced by informal units) acquired by the sectors not subject to the VAT.

VAT rate is the official rate by product.

As with import duties, the sum of all VATs calculated by product and by type of expenditure is adjusted to the overall amount collected by the Government (VAT on imports + VAT on domestic activities) after making some corrections to take into account the VAT levied on other transactions not related to products (interest).

(iii) Domestic consumption tax (DCT) and other taxes on products

The budget statistics and administrative accounts of the local Government are used to break down these taxes in such a way that the products subject to these taxes are directly identifiable from the lines of the government budget.

(iv) Subsidies on products

Subsidies on the products are derived mainly from the accounting and statistical documents

provided by the relevant administrative establishments, namely the "Compensation Fund" and the "National Interprofessional Office of Cereals and Pulses". The latter manages the subsidy granted on flour and cereals while the first manages the rest of the subsidies.

E. Transactions with the rest of the world: Imports and exports

Even though imports and exports belong to different sides of the SUT (with imports presented on the supply side and exports presented on the use side), they are treated simultaneously to the extent that the definitions relating to their content are essentially symmetrical.

1. Definition

Imports of goods and services consist of transactions from non-residents to residents, and exports *vice versa*. Transactions are not limited to sales, as barter, gifts and grants are also included.

Imports and exports of goods occur when there are changes of ownership between residents and non-residents.[5] The transaction must be registered at the time of the change of ownership. But the available information does not easily allow the implementation of these criteria. In the case of services, what is generally known is payment. In the case of goods, data from the passage through customs are also available. For this reason, with goods, we start by taking into consideration the fact of crossing the border of the economic territory, as it is informed by the customs statistics and then returned to the balance of payments. Then, a comprehensive correction is introduced referring to the consumption of residents outside the territory and the direct purchases in domestic market by non- residents.

Imported and exported goods do not necessarily move across frontiers. For example:

- Goods produced by foreign units operating in international waters can be imported directly (such as fish and oil).
- Movable equipment can be bought and imported by a resident from a non-resident without physically moving.
- Imported goods may be lost or destroyed after changing ownership but before leaving the country of origin.
- Direct purchases abroad by residents are considered imports while direct purchases of non-residents in the domestic market are considered exports, without any movement of goods or services.

2. Valuation and adjustment

Data on imports by product from foreign trade statistics are most commonly valued at c.i.f prices; these prices are used to evaluate imports by product. However, total imports are valued at f.o.b. prices as well as exports by product.

In the custom data, imports of goods are valued at c.i.f. prices which includes insurance and freight costs that occurred outside the economic territory, regardless of the residence of the party providing these services. In order to avoid double counting, the transport costs and insurance fees are considered as an import of services if the provider of these services is a non-resident or as a domestic production of services if it is a resident producer on the one

5. SNA 2008.

hand and as part of imported goods valued at c.i.f. prices on the other hand. Therefore, additional column and additional row must be introduced into the supply table to avoid duplication, as shown in the table below:

An example on c.i.f.-to-f.o.b. adjustment

Product	Imports (c.i.f.)	c.i.f./f.o.b. adjustment
Agriculture products	19 805	
Mining products	34 418	
Manufacturing	206 788	
Electricity, gas and water	1 565	
Construction	0	
Trade and repair	0	
Transport	26 967	-19 903
Insurance	2 035	-576
Other services	6 008	
c.i.f./f.o.b. adjustment	-20 479	20 479
Direct purchases abroad by residents	7 614	
Total	284 721	0

Source: Moroccan national accounts 2007.

3. Sources of information

There are two main sources to know foreign trade and its detail by products: the customs, for the majority of goods; and the balance of payments, for services.

(a) Customs statistics

In most countries, data on imports and exports of goods are obtained from customs declarations. These declarations are compiled for administrative purposes, namely the levy of import and export duties.

This source records the imports and exports of goods at a very detailed level using the HS classification but some complementary corrections are necessary for the compilation of national accounts and SUTs.

Fraudulent practices are common in customs controls: they can refer to the nature of the product involved (to avoid higher rights), or to the value of the products; they also result, more simply, from smuggling. The link between customs declaration and exchange control can also lead to false declarations. The multiplicity of declarations that need to be processed by customs statistical offices can also give rise to some errors: forgotten declarations, insufficient quality controls, erroneous coding of products, etc. It is not uncommon to find lags from one year to the next (considering the registration periods).

Some information about the goods must be looked for in the balance of payments (both in the credits and debits): supply of ships and aircraft, and expenses of the residents abroad. And sometimes it can be useful to consult the statistical information of the associated countries, to know what they have recorded in their commercial relationship with the country analysed (in quantities, values and evolution of prices).

(b) Balance of payments

The main source for services is the balance of payments, which records the imports and exports of services according to the payments. The balance of payments is similar to the concepts adopted in the national accounts, at least when the balance is prepared in

accordance with the last edition of the IMF Manual.

(c) Corrections that must be introduced

- In the case of transport and insurance services, the c.i.f./f.o.b. adjustment must be introduced to take into account the amounts already recorded in c.i.f. imports. This adjustment is usually made within the balance of payments framework.
- In the case of goods, the corrections refer symmetrically to imports and exports:
  - The disembarkation abroad of products extracted from the sea by resident vessels.
  - The re-fuelling of non-resident ships and aircraft made in the economic territory.
  - The final consumption within the economic territory of non-resident households.
  - ICs purchased locally by offshore enclaves.

Box 11. Purchases abroad by residents and direct purchases in domestic market by non-residents

In the SNA, household final consumption expenditure (HFCE) refers to the resident population. This means that:

- HFCE must include purchases abroad by residents and exclude purchases in the domestic market by non-residents.
- Exports must include purchases in the domestic market by non-residents, and imports must include purchases abroad by residents.

Consider first HFCE. Many countries estimate HFCE by household expenditure surveys. Only resident households are covered in these surveys and such surveys usually ask respondents to record expenditures made abroad. This means that if a country uses a household expenditure survey to estimate HFCE, this estimate will usually be fully consistent with the SNA: purchases in the domestic market by non-residents will have been automatically excluded because non-residents were not covered by the survey, and resident households will have reported their expenditures abroad. Of course, if the household expenditure survey does not ask households to report their expenditures abroad, HFCE will need to be adjusted to include them. But this is rare and household expenditure surveys usually generate estimates of HFCE that are consistent with the SNA. These countries do not need to make any adjustment to their HFCE to take account of direct purchases.

Some countries, however, base their estimates of HFCE on retail sales or production statistics and in these countries their first estimate of HFCE will not be consistent with the SNA rules.

Purchases in the domestic market by non-residents will be included and purchases by resident households abroad will be excluded. Countries whose initial estimate of HFCE is not consistent with the SNA can do one of two things:

- If they have detailed information on purchases abroad by residents and on purchases in the domestic market by non-residents, they can adjust their initial HFCE estimate at a detailed level. Usually, information on this is available from tourism surveys.
- If they can only estimate the total value of purchases abroad by residents and of purchases in the domestic market by non-residents, they can add the former and subtract the latter as two, one-line adjustments to their initial HFCE estimate.

Many countries choose the second method because it is less data-demanding and in this case, they will show purchases of residents abroad as a plus entry and purchases in the domestic market by non-residents as the last entries in the HFCE column of the SUT.

Source: UNECA (2012). Handbook on SUT: Compilation, application, and practices relevant to Africa.

4. Import and exports in Moroccan SUT

Imports and exports of goods and services are derived from 'external trade data' and balance of payments statistics produced by the 'exchange office' which is the official body in charge of producing the balance of payments.

To produce the data on national account's classification used for the SUT, a bridge table was built with the HS classification used for the foreign trade of goods statistics produced by the 'exchange office' on the basis of custom data.

In the balance of payments, the total of imports of goods is recorded f.o.b., which allows the necessary information to integrate the c.i.f./f.o.b. adjustment as the total c.i.f. imports is available through the detailed data from foreign trade statistics.

Furthermore, the balance of payments provides, in the service part, the data on the 'travel item' as credit (direct purchases in the domestic market by non-resident households) and as debit (direct purchases by resident households abroad). The credit side of the travel item will be recorded as an export and the debit side as an import in the SUT.

Table 3. Moroccan balance of payments according to the BPM6, 2015

	Credit	Debit	Balancing item (millions of DHs)
Goods and services account	325 112.1	402 548.3	-77 436.2
Goods	181 783.3	325 247.7	-143 464.4
General merchandise	181 331	325 164.3	-143 833.3
Net exports of trading (merchanting)	135.3	0	135.3
non-monetary gold	317	83.4	233.6
Services	143 328.8	77 300.6	66 028.2
Manufacturing services	12 264	48	12 216
Maintenance and repair services n.i.e.	2 309.6	830	1 479.6
Transports	26 598.4	29 513.9	-2 915.5
Sea Transports	7 963	20 202.5	-12 239.5
Air transport	14 641.8	7 154.1	7 487.7
Other transports	3 926.3	2 001.2	1 925.1
Postal and courier services	67.3	156.1	-88.8
Travel	61 149.7	13 696	47 453.7
Professional travel	2 751.7	1 165.2	1586.5
Personal Travel	58 398	12 530.8	45 867.2
Constructions	5 358	5 900.9	-542.9

	Credit	Debit	Balancing item (millions of DHs)
Insurance and pension services	1 118.8	647.4	471.4
Financial Services	644.8	1 418.2	-773.4
Uses' fees for intellectual property n.i.e.	32.4	933.6	-901.2
Telecommunications, computer and informatics services	14 032.3	1 851.1	12 181.2
Other business services	13 543	13 056.3	486.7
Personal, cultural and recreational services	689.3	323.6	365.7
Government goods and services n.i.e	5 588.5	9 081.6	-3 493.1
Primary income account	5 099.8	23 527.2	-18 427.4
Investment income	4 602.2	23 492	-18 889.8
Direct Investment	2 712.2	13 884	-11 171.8
Portfolio investment	1.6	3 801	-3 799.4
Other investments	120.7	5 807	-5 686.3
Reserve assets	1 767.7	0	1 767.7
Other primary income	497.6	35.2	462.4
Secondary income account	78 930.5	4 211.1	74 719.4
Public	5 250.9	732.8	4 518.1
Private	73 679.6	3 478.3	70 201.3
Balance of the current transaction account	409 142.4	430 286.6	-21 144.2
Capital account	6.1		6.1
Net lending (+) or net borrowing (-)			-21 138.10
Financial account			
	Net acquisition of assets	Net increase Commitment	Balancing Item
Direct investments	6 379	31 781	-25 402
Shares and Selling Shares	6 737	21 873	-15 136
Debt instruments	-358	9 908	-10 266
Portfolio investment	-1 464	11 434	-12 898
Financial derivatives	-2 439.6	-1 900.3	-539.3
Other investments	-508.7	17 435.4	-17 944.1

	Credit	Debit	Balancing item (millions of DHs)
Other holdings	290.2		290.2
Currency and deposits	2840.9	-3 275.6	6 116.5
Loans	-	14 852.6	-14 852.6
Trade and advance credits	-3 639.8	5 858.4	-9 498.2
Reserve auction	42 378.7		42 378.7
Total changes in assets/commitments	44 345.4	58 750.1	-14 404.7
Net lending (+) or net borrowing (-)			-21 144.2
Net errors and omissions			6 733

Source: 'Exchange office', Morocco.

F. Construction of the initial domestic use table

1. Intermediate consumption (IC (P2))

(a) An overview

Intermediate consumption measures the value of goods and services that are transformed or entirely used up in the course of production during the accounting period.

The boundary between intermediate consumption and other kinds of expenditures can be complex:

- Intermediate consumption does not cover the costs of using fixed assets owned by the enterprise nor expenditures on the acquisition of fixed assets.
- Goods or services paid by the company and used by employees in their own time and at their own discretion for the direct satisfaction of their needs or wants, constitute remuneration in kind. However, when employees are obliged to use the goods or services in order to enable them to carry out their work, these goods and services constitute intermediate consumption.
- Services linked to the acquisition of land and fixed capital are accounted for as GFCF.
- All expenses that contribute to the extension of the useful life of goods considered as fixed capital are also considered as GFCF not as IC.
- Purchases of goods and services made by the Government and NPIs for the benefit of households are counted among their final consumption expenditures.
- Expenditures on small durable producer goods may be treated as intermediate consumption when such expenditures are made regularly. Examples of such goods are hand tools such as saws, spades, knives, axes, hammers, screwdrivers, etc.

(b) Moroccan intermediate consumption matrix

To elaborate the IC matrix by industry and product, the data sources that produce the domestic production matrix are used. Namely:

- Structural surveys on organised companies (with official accounting) acting in fishing, mining, energy, manufacturing,

construction, trade and non-financial market services.
- Informal sector survey (non-farm production units).
- Survey on the Government's investment.
- Agricultural surveys (on crops and livestock).
- Budget statistics.
- Administrative accounts of local authorities.
- Accounting documents of public institutions and companies.

The intermediate consumption refers to the actual use of goods and services in the production process, i.e. it does not cover the acquisition of products for the IC purpose kept in stocks.

Intermediate consumption = IC = Acquisitions – Changes in inventories

The intermediate consumption is valued at purchasers' prices, which are equal to:

Basic price received by the producer of the good or service

+ transportation costs paid separately and invoiced by the producer (the methodology used to estimate these costs have been seen in the part reserved to the transport margins, the amount estimated by product and industry is added to the initial value given by the surveys (formal and informal enterprises) to move to IC including transport margins)

+ trade margins

+ non-deductible tax less subsidies on the product

It is important to note that:

- The acquisitions of the sectors not allowed to deduct the invoiced VAT (purchasers who are outside the VAT system, such as the informal sector) are valued at the paid price including all tax.
- The acquisitions by the formal enterprises (purchasers who are within the VAT system) for IC purposes are valued at the paid price less any deductible VAT.

Table 4. Intermediate consumption matrix at purchasers' price: a Moroccan example

	Intermediate consumption by major industry group							
	A-B	C	D	E	F	G	O S	
	Agriculture, hunting and forestry and fishing	Mining and quarrying	Manufacturing	Electricity, gas and water supply	Construction	Trade and repair	Other services	Total IC
Agriculture, hunting and forestry and fishing	19 811	0	58 410	0	29	1 385	1 914	81 549

	Intermediate consumption by major industry group							
	A-B	C	D	E	F	G	O S	
	Agriculture, hunting and forestry and fishing	Mining and quarrying	Manufacturing	Electricity, gas and water supply	Construction	Trade and repair	Other services	Total IC
Mining and quarrying	0	353	39 445	4 250	3 044	87	516	47 695
Manufacturing	18 659	3 338	146 051	3 345	48 240	18 481	33 149	271 263
Electricity, gas and water supply	1 265	333	4 945	593	468	1 488	4 669	13 761
Construction	240	15	371	154	43	715	1 248	2 786
Trade and repair	80	1	0	0	36	149	2 331	2 597
Other services	1 974	2 177	14 216	1 736	3 534	13 730	51 977	89 344
Total	42 029	6 217	263 438	10 078	55 394	36 035	95 804	508 995

In the intermediate matrix, the total across the rows shows how much of a given product is used as intermediate consumption by all producing units (from the table 4, we can conclude that 81,549 is the demand of all industry on agriculture products for their intermediate consumption). The total down a column shows the total of all types of products used as intermediate consumption inputs by an industry (agriculture activity uses 42,029 on diverse products for its intermediate consumption).

2. Gross fixed capital formation

(a) An overview

Gross fixed capital formation (GFCF) relates principally to investment in tangible fixed assets such as machinery, transport equipment, dwellings and other buildings and structures.

However, it also includes investment in intangible fixed assets, improvements to land and also the costs associated with the transfer of assets.

Generally, in case of goods, it is considered as GFCF the acquisition (less disposal) of durable goods (more than one year of life) to be used in the production process. Usually, a minimum value is set to exclude what is called small tools.

Among the goods to be considered, we can mention:

- Households' acquisition of dwellings (including own account production,

that makes them producers of a housing service).
- Animals cultivated for the products they yield year after year (e.g., dairy cattle and draught animals).
- Works to improve agricultural lands, as well as the prospecting and enhancement of mining deposits.
- Durable plantations (for forestation or agricultural production).
- Mineral exploration (successful and unsuccessful).
- Machinery and equipment.
- Military weapon systems.
- Intellectual productions (application programs, recreational, literary...).
- Computer software and databases.
- All services linked to the acquisition of these products.

When the fixed assets are sold, they are taken into account negatively in the GFCF of the unit that sells them. In the case of works referring to durable goods, not finished during the period, their value is recorded as a change in inventories, except in the case of construction products: when the purchaser is already known, the value of the works of the year is set as the GFCF of the purchaser.

It is important to note that the acquisitions of lands and valuable objects do not appear in the GFCF.

(b) Moroccan methodology for estimating GFCF by product

Two methods are used to estimate the gross fixed capital formation:

- The first one is based on the demand of sectors for a GFCF product, with information collected from firms in statistical surveys and administrative returns for the public sector.
- The second one is based on the available product destined to the GFCF, the supply of fixed assets from the domestic production and imports.

The two methods are established in a parallel and integrated way within the framework of the product balances of capitalised goods using the commodity flow approach.

(i) Demand side

The data used in the 'demand approach' to calculate GFCF by investor sectors derive from the following sources:

- Structural surveys for non-agricultural and non-financial corporations broken down by kind of activity; these surveys provide the GCFC of organised corporations by products.
- Accounting documents of financial companies: The accounting of financial business records additional information on the balance sheet as the "non-financial fixed assets table". This table shows the asset flows by category and by type of flow (acquisition, production for own account, sale, transfer and withdrawal) made during the financial year concerned. This table is used to estimate the GFCF of financial corporations by category of assets.
- Informal sector survey for unincorporated businesses: This survey provides data on acquisitions and disposals by types of products (assets). The products selected in GFCF correspond to those whose purchase value exceeds 1000 DH.
- Investment survey for public administrations (State, non-profit public institutions and local authorities) carried out among the different components of the sector.

- Budget statistics, administrative accounts and accounting documents of the public institutions. The transition from these different sources to the GFCF by product is achieved through a bridge table established according to the 'economic nature' of the expenditures made by the concerned administrative entities.
- Building permits statistics (for the part authorised by household) are used to estimate the market GFCF of household (using a grid drawn from a specific survey on the achievements of authorized construction by type of construction work).
- Acquisition of machinery and equipment by the agricultural sector available from the survey of living standards of households (independent employment component: agriculture part) and complimentary data from the Ministry of Agriculture.

In addition, cost of ownership transfer of produced and non-produced non-financial assets should be added to the GFCF. Transfer costs cover stamp duties, legal fees, dealers' margins, agents' commissions and other costs incurred in connection with the transfer of ownership of lands and buildings. These costs are always not capitalised and therefore indirect estimates are made to supplement the measure of the GFCF by sectors.

(ii) Supply side

The GFCF is calculated based on the information available by product.

The methods used in this context are to first draw up the list of products likely to be immobilised and then to estimate the potential supply of products that would be intended for GFCF. These estimates are part of the implementation of product balance of these specific goods and services.

The statistics used in this framework provide information on:

- Production and sales of industrial products (structural survey and informal survey).
- Imports by product according to the HS classification (foreign trade statistics).
- The value of building permits by building category and economic agent (building permit statistics).
- Livestock numbers by category and age group (livestock survey, refer to box 5).
- Plantation production (new plantations and their maintenance until maturation). It is a production intended for the GFCF agricultural product.

It should also be noted that, according to the two approaches, GFCF is determined by economic agent demand and by product according to local or external origin (imports) and arbitration is carried out between the different sources used.

3. Changes in inventories

(a) An overview

Changes in inventories correspond to the difference between the inflows and outflows of inventories during the period considered, valued at the market price on the day of the transaction (the same good can then be accounted for at the entrance and exit at different prices). The inventories include all the goods that are not part of the fixed capital and that are, at a given time, in possession of the resident producing units. They also include some services:

- Those that can be subject to a GFCF, as long as they are not sold.
- The production of services under development.

There are four types of inventories (formerly called stocks):

- Materials and supplies stored with the intention of using them in production as intermediate inputs (including precious materials).
- Work-in-progress, including growing crops, maturing trees and livestock, uncompleted structures (except production on own account or under a contract of sale agreed in advance), other uncompleted assets (e.g., ships) and partially completed research, film productions and computer programs.
- Finished goods, i.e. output which the producer does not intend to process further (including that for use as intermediate input to some other production process).
- Goods for resale, i.e. that were acquired with a view to reselling in their existing state.

The first category of stocks is held by users, generally the goods and services producing companies, while the last category is limited to traders. The remaining two categories are owned by the producers of the products concerned.

(b) Moroccan methodology for estimating changes in inventories by product

In Moroccan national accounts, it is assumed that the changes in inventories held by informal units are negligible, and that the evaluation of changes in stocks concerns mainly the organised enterprises.

The estimation of changes in inventories is established by product using the data from the structural surveys.

It should be noted that special estimation is done for agriculture products:

- Changes in inventories of cereals using the accounting document of the public body that manages this stock (ONICL).
- Changes in inventories of livestock are estimated according to the age and type of animals (box 5).

Box 12. Calculation of changes in inventories from the data of business accounting

According to the SNA, the changes in inventories, regardless of their category, should be calculated by:

Stock entries- withdrawals from Stock – Recurrent losses from inventories

The valuation is made at the price of the time when the entry or withdrawal takes place.

However, in practice, the available information corresponds to companies' accounting data or sometimes to quantities of stock held at the end of the year (example: cereals, mining and petroleum products).

In business accounting, inventories are usually calculated using the appropriate prices at the time of the inventory which is often made at the end of the calendar year. This type of information does not make it possible to apply the method recommended by the SNA.

In order to use a method that is based on the national accounts recommendations, the change in inventories (VS) is obtained, for a given product, by:

VS = [quantity of stocks at the end of the year – quantity of stocks at the beginning of the year (end of previous year)] x average price of the year

The difference between final stock and initial stock obtained from the business accounting is called 'accounting' change in stocks. It is usually broken down into the four categories mentioned above. To split this evaluation of the changes in inventories to the detailed classification of product of the SUT, structural surveys are used since they give the information in the value of stocks at the beginning and at the end of the year by kind of product.

Since the value of the change in accounting stocks does not match with that of the national accounts, the transition from first to second is necessary. This passage is obtained for each type of products as follows:

Let: I (te / tb): price index between the beginning and the end of the year (t)
I (ta / tb): price index between the beginning of the year (t) and the average price of that same year
SF: stock at the end of the year (t)
SI: stock at the beginning of the exercise (t)
VS: change in inventories in the national accounts

VS = (SF: I (te / tb) / I (ta / tb)) – (SI * I (ta / tb))

4. Household final consumption expenditure

Household final consumption expenditure mainly covers the expenditures borne by resident households to purchase consumer goods and services. In practice, it also includes goods and services received as in-kind income, although it is not the households that spend it. It excludes spending by households on the acquisition of dwellings and their major maintenance, which constitutes a formation of fixed capital, as well as spending devoted to the acquisition of valuables.

Household final consumption expenditure can be subdivided into three components, which are, however, of very unequal sizes:

- Purchases of goods and services.
- Consumption of goods and services by those who produced them (often called "self-consumption").
- Benefits in kind as part of employees' remuneration.

(a) Purchases of goods and services

Goods and market services constitute the bulk of this item, which also includes payments made by households when certain non-market services are consumed. The position covers as follows:

- Purchases of new goods.
- Acquisitions of second-hand goods.
- Purchases of market services.
- Purchases of non-market services.
    - Purchases of new goods exclude purchases of dwellings classified as capital formation but cover purchases of durable goods, such as motor vehicles, including those purchased under leases.

Box 13. Acquisitions of second-hand goods

Accounting for acquisitions of second-hand goods is reflected in different ways depending on the nature of the agents involved in the transaction. When selling a used good between households, the final consumption expenditure, taken as a whole, includes only the value of the commercial margins possibly realized during this sale: When a household purchases second-hand goods from a company (a car for example), the full purchase value is recorded as household consumption expenditure, while the seller records a negative GFCF. The same applies when the purchase concerns an imported used good.

- Market service purchases done by a household cover a range of services provided by other parties, outside the household itself, against payment. In many cases, the amount of the payment makes it possible to measure the consumption expenditure.

However, the measure of expenditure on certain services is, like the corresponding production, dependent on certain agreements. Thus:

- The measure of the production of certain services is based, not on the total expenditure made by the consumer, but on the only commission taken by the service provider. This is the case of the services of travel agencies: Travel agencies provide travel and tourism services to the public on behalf of suppliers such as airlines, car rental agencies, cruise lines, hotels, railways, travel insurances. The total amount paid by a household to a travel agency does not represent its consumption expenditure on travel agency product, only the commission that would be returned to the agency is the household final consumption expenditure on travel agency service.
- The measurement of consumer expenditure on insurance services is totally dependent on the rules adopted to measure their output.
- Consumption expenditure depends on the border between market and non-market services. Thus, even if they are largely financed by compulsory levies, the services produced by medical professionals practicing in the framework of liberal professions are always considered as market services, while the production of medical inpatient services is non-market.
- Payments made by households to general government are sometimes analysed, not as tax payments, but as remuneration for the provision of a service, and included as such in household final consumption expenditure.
- Purchases of non-market services are payments made by households as consumers of non-market services. These payments do not cover most of the cost of the services provided; they are referred to as “partial payments”. Examples are provided by museum fees and tuition fees. The largest expenditure of households concerns their participation in hospital expenses.

Box 14. Distinguishing fees and taxes

It is not always clear whether payments made by households to government units to obtain various kinds of licenses, permits, certificates, passports, etc. are payments for services or de facto taxes.

It is recommended that following the 2008 SNA, payments by households for licenses to own or use vehicles, boats or aircrafts and licenses for recreational hunting, shooting or fishing are treated as taxes, as no actual services are provided by government. Payments for licensees to undertake a specific activity, such as taxi licenses, are treated as a tax on production.

Payments by households for all other kinds of licenses, permits, certificates, passports, etc. that require government services such as inspection, should be treated as purchases of services and included in household consumption expenditure.

(b) Self-consumption of goods and services

Self-consumption is the counterpart of household production that is destined for their own final consumption.

In principle, all goods are subject to self-consumption. It must be accounted for if it is considerably significant in relation to the total supply of the goods concerned.

Self-consumption of services covers two items:

- Services produced by owners occupying their own dwellings (imputed rents).
- Domestic and personal services produced through the employment of paid staff: they include services related to the employment of domestic workers, child minders, caretakers. Since services resulting from unpaid domestic activity are not included in the scope of production, they are not part of the final consumption of households either.

(c) Benefits in kind

Compensation in kind is considered to be a benefit in kind: it consists of goods and services provided as a compensation by employers for employees, without charge or at a price lower than their purchase price. It may relate to goods and services that are produced by or bought by the employer's business. These goods and services are always considered to be from market production.

Examples include the provision of free energy products to staff, meals provided to restaurant staff, free telephone calls for employees of telephone companies, and so on.

Benefits in kind provided to the military (such as clothing, food and transport) as well as employer payments to works councils are also taken into account.

Generally, when a good or service is provided free of charge, the value that is recorded as a benefit in kind is the purchase price if the product is purchased by the employer, or the basic price if it is produced by the employer.

If the good or service is provided at a reduced price, only the part financed by the employer is part of the benefits in kind: in this case, the employee bears the additional expense.

(d) Moroccan methodology for estimating household final consumption expenditure (HFCE) by product

The majority of household final consumption expenditure is accounted for by household

spending on goods and services, which calculations are essentially based on the following two sources:

- Household living standards survey (1998 and 2007).
- Household consumption and expenditure survey (2001 and 2014).

These surveys are carried out by the HCP. They provide information about household consumption expenditures on goods and services, with considerable detail in the categories used. These surveys are known to be valuable tools for understanding household consumption. They aim to study expenditures, the amount and nature of which are recorded in a classification of about 1150 positions (bridge table is established with the SUT Product's classification).

In Moroccan surveys on "household living standards" and "household consumption and expenditure", all households' expenses are covered, including some expenses that are out of the scope of households' final consumption expenditure as defined by the SNA: for example, some household payments that should be considered as taxes or transfers to NPISH appear in separate items, and they are excluded from household final consumption expenditure.

Moreover, these surveys collect information on consumption that does not give rise to expenditure, such as: self-consumption (own-account dwelling services produced by owner-occupiers of dwellings, production of agricultural products or other goods for the purpose of own final consumption), and major benefits in kind provided by the employer (provision of a dwelling...).

The final consumption of households by products included in Moroccan SUT covers the expenditure made by non-resident tourists on the economic territory. Most of this expenditure is on services, such as transport, hotels and restaurants. The total of this expenditure is given by the balance of payment (BOP) from the travel item (credit) and its value disaggregated by products is estimated using the data from the survey on international tourism, carried out by the Ministry of Tourism. The main objectives of the survey are to obtain statistics on tourism (in keeping with the recommendations of the international organizations) and to gather data on the characteristics of the tourism services market for a better understanding of the phenomenon.

Direct purchases abroad by residents are reported on a special row that relates to the territorial adjustment, and they are included in the total of importations.

Table 5. International tourists' expenditures by item, 2015 MDH

Items	Foreign tourists	Moroccans residing abroad (MRE)	Total
Hotels and other commercial accommodation	11 139	561	11 699
Food and beverages at the hotel	1 377	31	1 408
Catering out of the hotel	4 683	4 427	9 110
Internal rail transportation	139	46	185

Items	Foreign tourists	Moroccans residing abroad (MRE)	Total
Transport (cars, buses and taxis)	1 433	849	2 281
Internal air transport	18	14	32
Car rental	756	268	1 024
Rental of leisure equipment	873	815	1 687
Parking, tolls, repairs	330	1 064	1 393
Fuels and lubricants	1 239	3 829	5 068
Tourist information and guides	290	22	312
Cultural services	691	533	1 224
Relaxation and other entertainment	3 040	2 947	5 987
Crafts (excluding textile and leather)	1 433	1 122	2 555
Textile and leather goods	2 001	1 882	3 883
Medical care	330	676	1 006
Total	29 772	19 086	48 854

Source: Ministry of Tourism.

Final consumption in the territory is a calculation step for estimating the final consumption of resident households, which constitutes the relevant final consumption concept for the national accounts as a whole, particularly in the context of the institutional sector accounts. The transition from the first concept to the second uses information from the balance of payments, and it is done in an aggregated way, without any impact on the product breakdown.

When we move from final consumption in the territory to the final consumption of households:

- The expenditures of non-residents on the economic territory, which are excluded from the final consumption of households, become exports.
- Residents' expenditures outside the economic territory are added to the final consumption of households, and are offset by the registration of additional imports.

Table 6. Adjustment for direct purchases abroad by residents and direct purchases in domestic market by non-residents in Moroccan SUT

	Households consumption expenditure	Export of goods and services	c.i.f. imports
Total HCFE on the economic territory	422 839		
Direct purchases in domestic market by non-residents	-62 834	+ 62 834	
Direct purchases abroad by residents	7 614		+ 7 614
Total HCFE of resident households	422 839 – 62 834 + 7 614 = 367 619		

Source: Supply and use table, Morocco 2007.

Other direct sources are used to check the plausibility and to complete data on households' final consumption expenditure reported by surveys on household's spending on some specific products:

- Government budget statements (revenues) and administrative accounts of local administration are used to estimate the household's consumption expenditure on non-market services in two general cases:
  - When the household's payment is considered, not as a tax, but as the remuneration of a service delivered or organized by the public administrations: this is the case of the garbage removal tax.
  - When the household's payment corresponds to the participation in the financing of a non-market service, in the form of a "partial payment": this concerns all the non-market services of the public administrations, non-market health in particular.
  - These expenditures are available in surveys on household expenditures and a work of confrontation of these two data resources is operated to assess the final figures.
- Data of Central Bank (Bank Al Maghreb) are used to estimate the households consumption expenditure on financial intermediation services indirectly measured (FISIM).

5. Government final consumption expenditure

(a) Introduction

Government final consumption expenditure (GFCE) covers spending, other than on capital goods, by central and local government.

Government consumption is a result of their non-market output and the expenditure on products supplied to households via market producers (social benefits in kind).

- Government purchases the non-market output of the government sector, which is produced from its intermediate consumption and value added. Final expenditures therefore can be seen as the sum of compensation of employees and purchases of goods and services, and the consumption of fixed capital.

- The value of sales of goods and services at both economically significant and insignificant prices, are deducted from purchases and from expenditures of the government's own GFCF.
- Social benefits in kind are covered by many different schemes and are mainly provided by the State and social security funds (especially health schemes).

(b) Moroccan methodology for estimating government final consumption expenditure by product

Two main sources of data are used to calculate the government final consumption expenditure:

- Budgetary statistics of the State for which expenditure, whether current or capital, is traced in the budget accounts where expenditure is centralised by ministry, and in each ministry, by chapter, article and paragraph. With regard to revenue, the same source provides a document in which the lines of revenue are detailed.
- Accounting documents of the local government administration, of social security bodies and those of public non-profit institutions.

General government has two types of final consumption expenditure:

- An expenditure on goods and market services that it transfers to households in the form of social transfers in kind (it refers, in Moroccan accounts, to the refunding of the households' expenditures on medical products and market health services by the social security organisations).
- An expenditure on the non-market services it produces itself, which is also partially transferred to households. Only the part of non-market services that does not give rise to a payment from users - in the form of residual sales or partial payments (entrance fees to a museum, partial payment in a public hospital, receipts from sales…) – is included in the final consumption expenditure of general government.

Analytically, this aggregate corresponds to:

P3 = P1 – P11 – P12 – Partial purchases of households + the value of goods and services purchased from market producers for delivery to households free

With
P3: Government final consumption expenditure
P1: Global output
P11: Market output
P12: Non-market output for final own use (here as GFCF)

6. Final consumption expenditure of non-profit institutions serving households

The final consumption expenditure of non-profit institutions serving households (NPISH) only relates to the non-market services they produce. It is simply equal to their non-market output, less the payments receivable from households when getting this output.

In Moroccan accounts, thanks to the first survey on NPISH carried out for 2007, a lot of indicators have been calculated for this sector, namely:

The output of the HPISH by product
The intermediate consumption by product
The GFCF of NPISH by product
The final consumption of NPISH
Salaries and labour costs.

Due to a lack of information, the market products that the NPISH buy and provide free of charge to households as social transfer in kind are not retrieved as final consumption expenditure by NPISH. In the balances of these products, this expenditure is, therefore, recorded as part of the intermediate consumption of the NPISH. And the final consumption of NPISH is estimated as the sum of their non-market output broken down by product.

G. Construction of the gross value added quadrant

Gross value added (GVA) measures the contribution to GDP made by individual producers, industries or sectors. Gross value added is measured as the value of output less intermediate consumption. It is the source from which primary incomes are generated. In other words, it is the part of output that is used to pay the suppliers of labour and capital services and to pay other taxes on productions less subsidies on production.

In the SNA, wages, salaries and employers' social contributions are referred to as **compensation of employees**. The compensation of the suppliers of capital services is the residual portion of output, a balancing item, and is called **gross mixed income** or **gross operating surplus**. The latter term is used if the producer is incorporated, while the former term is used if the producer is unincorporated.

1. Compensation of employees (D.1)

Compensation of employees is defined as the total remuneration, in cash or in kind, payable by enterprises. It comprises not only wages and salaries but also social contributions payable by the employer (including imputed contributions for unfunded benefits).

Box 15. Employees versus self-employed

To be classified as 'occupied' a person must be engaged in an activity that is within the production boundary. Of these, 'employees' are those who have an agreement (formal or informal) with an enterprise to work in return for remuneration, normally based on time spent or work done. The 'self-employed', on the other hand, are people who own unincorporated enterprises in which they work, these being neither separate legal entities nor separate institutional units. Such people receive mixed incomes rather than compensation. For the purpose of classifying incomes in the economic accounts, any occupied person producing entirely for their own final consumption or capital formation, whether individually or collectively, is treated as self-employed, as are unpaid family members. That is to say, their remuneration takes the form of mixed income. However, where a single shareholder (or a small group) not only owns a corporation but also works for it and receives remuneration (apart from dividends), he is treated as employee. Students are generally regarded as consumers (of educational services) rather than employees unless they have a formal commitment to provide labour, (for example as apprentices, articled clerks or research assistants) in which case they are treated as employees even if they receive no remuneration at all in cash.

Self-employed persons can be either employers (i.e. those with paid employees) or own-account workers. A special category of the latter is outworkers, who have a prior arrangement or contract to work for a particular enterprise but whose place of work is not within any of its establishments, generally being at their home. They therefore meet at least some of their own production costs.

Outworkers have some characteristics of employees and some of the self-employed, and their classification is determined by the basis on which they are remunerated: those paid for the amount of work done (i.e. inputs) are employees, whereas those paid according to the value of their outputs are self-employed, as are those who themselves employ others to do the same kind of work. A supplementary criterion, as already suggested, is that employees have implicit or explicit contracts whereas own-account workers do not. The distinction has significant implications for the economic accounts as employees are paid out of the enterprise's value added while payments to own-account workers are purchases of intermediate goods and services. The income of the self-employed is 'mixed income'.

(a) Wages and salaries (D.11)

Wages and salaries comprise several elements:

- Regular earnings, including those for piecework, overtime, working away from home, etc.
- Supplementary allowances in respect of housing, travel to work, etc.
- Holiday or lay-off pay for employees away from work for short periods.
- Ad hoc bonuses and other exceptional payments linked to the overall performance of the enterprise.
- Commissions and gratuities received by employees, which are treated as payments for services rendered by the enterprise and included in its output and value added.
- Social contributions, income taxes, etc., payable by the employee, even if withheld by the employer for payment directly to the authorities.

Wages and salaries in kind are goods and services provided by an employer which are not necessary for work and can be used by employees or members of their households in their own time and at their own discretion for the satisfaction of needs and wants. Income in this form may be less welcome than cash but it still needs to be valued consistently with other goods and services, using purchasers' prices when the items have been purchased by the employer and producers' prices when they have been produced by the employer. Some of these (e.g. transport to work, car parking and crèches) have some of the characteristics of intermediate consumption but they are treated as compensation because they are not related to the production process or working conditions and many employees have to pay for such things out of their own incomes as final consumption.

Wages and salaries do not include reimbursement of expenses incurred by employees in taking up new jobs or equipping themselves with tools, clothing, etc, needed wholly or mainly for their work. These are treated as intermediate consumption of employers. Any necessary expenditure which is not reimbursed is deducted from wages and salaries and added to intermediate consumption – not regarded as household final consumption.

(b) Employers' contributions (D.12)

These comprise contributions in cash (D.121) by the employer to social security schemes or private pension funds, insurance or medical schemes; and imputed contributions (D.122) in respect of unfunded benefits. 'Employers' contributions exclude those payable by the employee, even if they are withheld by the employer and paid directly to the scheme.

Unfunded social benefits are sometimes paid by employers in the form of, for example, education allowances for employees' dependents, payments for sickness or maternity leave and severance pay. These are not strictly a form of remuneration because they are not related to the amount of work done but provided selectively to individual employees meeting certain criteria. However, the contingent liability incurred by the employer is treated as a form of employee remuneration.

(c) Compensation of employees: Moroccan approach

Compensation of employees corresponds to the remuneration received by employees in return for the work performed during the production process. This remuneration includes gross wages (in cash and in kind) and employers' contributions to the social security pension and insurance schemes for their staff. This last component corresponds to the social charges borne by the employers. These expenses generally consist of the following contribution categories:

- Social contributions to the National Social Security Fund (CNSS).
- Contributions to the Moroccan inter-professional retirement fund (CIMR).
- Contributions to the Moroccan retirement fund (CMR).
- Contributions to the collective retirement benefit scheme (RCAR).
- Social contributions to the internal funds of certain companies.
- Direct social benefits for employers.
- Social insurance premiums (sickness and work accident).

The estimation of the compensation of employees by industry is based on different data sources according to the employer sector:

(d) Formal non-agriculture and non-financial enterprises

The structural surveys are used to estimate the wages and salaries as well as the employers' contributions to the National Social Security Fund (CNSS) and to the Moroccan inter-professional retirement fund (CIMR) and their payments to the insurance corporations to cover their staff. The surveys inform also on the employers' direct social payments (see structural surveys questionnaires).

(i) Financial corporations

The accounting documents provide information on gross salaries and social employers' contributions on the units acting in banking, other financial intermediation and insurances.

(ii) Informal non-agriculture sector

National survey on non-agriculture units provides the gross salaries paid to employees for the work performed by kind of activity.

The social contributions in this part of the economy are assumed to be negligible.

(iii) Agriculture

Gross wages are determined from the household living standards survey (employment component: agriculture section). This survey provides information on the number of employees in the agricultural sector,

the number of working hours and the wages received in return for the work done. It is supplemented by other data on wages and labour costs of enterprises undertaking agricultural activities sourced from agricultural census.

The total remuneration of employees in the agricultural sector as well as their number and duration of work from these sources are compared with data from national employment survey to validate them or make the appropriate corrections.

(iv) General government sector

The remuneration of the employees of the different activities, falling under the general government sector, is calculated directly from the State budget statistics, the local authorities' administrative accounts, the accounting documents of the public establishments forming part of the sector and those of the social security organisations. These documents make it possible to calculate gross wages and social charges separately, distinguishing between direct social contributions and imputed contributions such as family allowances granted from the state budget directly to employees.

(v) Non-profit institutions serving households

The survey on non-profit institutions serving households (NPISH) provides data on the salaries paid to the employees and the social contribution of NPISH broken down by industry.

Finally, it should be noted that the calculation of employers' social contributions is carried out by branches of activity at different levels of detail, according to the sector of employers and the relevant data sources. Therefore, the accounting data of institutions managing and offering the social security services allow direct information on social contributions (employees' contributions (D.6112), employers' direct contribution (D.6111) and Imputed social contributions (D.612)); The sum of detailed employers' social contributions by kind of activities estimated through different data sources according to the employers sector is adjusted to the overall amount of employers' social contributions (D.6111 + D.612) available from the social security institutions' accounting documents.

2. Other taxes on production and other subsidies on production

Under 'other taxes on production' (D.29), it is possible to distinguish certain taxes levied on production but not on individual products. These include:

- Taxes on *payroll or workforce.*
- Recurrent taxes on the use or ownership of *land, buildings and other structures.*
- Licenses to carry out a particular business or profession.
- Taxes on the *use of vehicles or other equipment* needed for production.
- Taxes on *pollution* (excluding charges for the collection and disposal of waste by public authorities – part of intermediate consumption).

Such taxes are payable irrespective of the profitability of production. Taxes on profits and other incomes received by businesses are excluded from this category.

Other subsidies on production (D.39) include those on payroll or workforce instituted for economic or social reasons and subsidies for additional processing to reduce pollution.

In Moroccan national accounts, budget statistics and local government accounts are used to determine other taxes and subsidies on production and their breakdown by industry.

3. Gross operating surplus and gross mixed income (B2/B3)

These are alternative names for the balancing item in the generation of income account, measuring the surplus accruing from production before deducting payments or adding receipts of interest, rents and other property income.

Gross operating surplus is the return on capital of the institutional sectors of financial and non-financial corporations, general government, NPISH, and households as owners of dwellings and other buildings for rent, whereas gross mixed income remunerates at the same time the capital and the work performed by the owners of the individual enterprises belonging to the institutional sector of households.

H. Balancing supply and use tables

Building an SUT involves bringing together data from many different sources with different quality levels.

However, data is never perfect; it can be insufficient, unreliable or even completely false. Balancing SUTs involves large part of data analysis and an important work of synthesis to reach coherent and reliable national accounts data, through:

- Systematic interrogation of data and its quality control.
- Use of justifiable assumptions.
- Discussions with subject matter specialists.
- Estimation of missing values.
- Balancing uses and supplies and industries accounts at a detailed level.

Basic identities, checks on plausibility and credibility, and investigation of possible causes of inconsistencies are the main keys of the balancing process. Basic identities refer to the balance of products' supply and use (commodities' balances) and the balance of the industries' accounts. Explicitly, the supply and use balancing guarantees that all GDP components are fully reconciled, by ensuring that:

- The supply of products – goods and services produced by the domestic market and non-market sectors plus any imports – equals the demand for products by domestic producers and consumers plus any exports.
- The inputs to industries – goods and services used up during production plus the primary inputs of labour and entrepreneurship plus others taxes less subsidies on production – equal the outputs from industries.

The approach also takes account of the fact that supply is measured at basic prices while demand is measured at purchasers' prices. This is done by making adjustments to supply accounting through the valuation vectors (taxes and subsidies on products and trade and transport margins).

However, balancing SUT is not just necessary in order to achieve identity between supply and use for each product, and identity between output and input for each industry. Balancing also allows for tracing inconsistencies of basic data and estimation methods used. It is why the balancing process starts with the detection of large inconsistencies in the basic data and in the initial unbalanced SUT, which need additional analysis and detailed investigations.

1. The analytical phase of balancing SUTs

Once the initial (unbalanced) SUT has been populated, the steps of SUT implementation from stage 1 to stage 3 have been completed. To produce a final balanced SUT, the national accountant's work includes a quality control of the collected individual data, a comparison of the various sources to ensure coherence and a global synthesis to reach a consistent and reliable national accounts data. However, two major stages (stages 4 and 5) are still required.

The construction of the initial SUT is just a juxtaposition of data in which confrontations have been limited to simple neighbourhoods. With the analytical stage, systematic confrontations between all the data gathered are made. The proposed procedure to carry out these confrontations systematically associates both the accounting relationships contained in the SNA and the economic and technical relations that unite all these transactions.

The confrontation is done through an iterative approach using partial synthesis instruments namely the supply and use balances (commodities' balances) and the industries' accounts.

The balancing of supply and use table is an iterative process. The basis of this approach is that the supply and use of products and industry inputs and outputs are intertwined through the output and intermediate consumption of products. The matrix nature of the SUTs means that adjustments to one cell to bring a row into balance can introduce imbalances into other rows and columns. So each product balance can unbalance the industry account and vice versa.

To facilitate the convergence of these round trips, it is preferable to provide adjustment items which are the intermediate consumptions. These are at the centre of the SUT, both as inputs for the industries and as a use of the product: The total intermediate consumption of all the products is equal to the total intermediate consumption of all the branches.

From an instrumental point of view, a supply and use balance contains only the total intermediate consumption of the product, not its breakdown into branches. A national accountant in charge of balancing a product does not usually manage the distribution of the intermediate consumption of his product by the branches, as this is often exogenous to him. During this analytical phase of the synthesis, the duty of the accountant in charge of a given SUB is to establish the balance of product using the commodity flow method (He has to define the level of the product used as IC without paying attention to the level due to each industry). It will be accepted then to maintain a double vision of the intermediate consumption: on the one hand, the 'IC demand' of the industries and, on the other, the 'IC supply' of products in the SUB. The balancing of an SUT aims to establish the equality between these two IC.

The SUBs and the accounts of the industries are developed in a decentralized manner. The sharing of the results allows a transversal reading of the economic aggregates, and the possible questioning of some of them. In this case, a new decentralized phase is necessary, and so on until an agreement is reached between the production and expenditure approaches.

(a) Elaboration of supply and use balances

The objective of this elaboration is to articulate with each other the data referring to the specific supply and demand of each product. As it is an

ex-post balance, the probable gap between these data is due to statistical differences, since the balance of supply and use has necessarily been realized.

As the SUB is the place of convergence of multiple statistical sources not articulated with each other, there is no hope that they are compatible. It is then a matter of comparing the sources, questioning the methodology applied and explaining the differences that exist between supply and demand of commodities.

The detailed information collected on production and imports allows the formulation of hypotheses about the destination of the products that make them up. Thus, there is an important element of criticism with respect to the data related to the demand, which allows improving the distribution between IC, FC and GFCF. However, in regard to ICs, complementary work is necessary to assign, to an industry (or group of industries) users, the total amount adopted in the balance of product (IC supply). The amount that has not yet been assigned to industries can be kept in a waiting party, which will be used at the time of the synthesis of the SUT.

In some cases, the information available for a transaction is not known with the most elementary level of detail chosen for the preparation of the SUBs. When that happens, we can proceed to a first arbitration at that less detailed level, and then return to the more detailed level (or proceed by iteration between the two levels involved).

At this stage of the work, the national accountant responsible for establishing the SUB can make some justified assumptions concerning the uses of the commodity by particular industries. For example, in the case of a productive chain, when a product is transformed by a single industry or when this industry uses a given product with priority, it is adequate to change the industry's intermediate demand on this product to meet the IC supply. Furthermore, he can adjust the primary production of the industry that produces the product for which he is establishing the SUB in order to meet the total of uses. However, that does not mean all discrepancies between supply and uses of products have been eliminated, especially in the case of a product that can be consumed by large part of industries (packaging, fuel, business services…).

Commonly the population of the SUB is based on the confrontation of supply and demand carried out at detailed level of products through the application of the "commodity flow method". This method seeks to identify gaps between supplies and uses of products and to eliminate the discrepancies in the iterative process that analyse inconsistencies and valuation problems in the data system.

The gap between total supply and use for each product is closed by a "bridge column" and the responsible for establishing the SUB of a given commodity should look into how remains of the supply can be attributed to different uses, depending on the nature of the products offered and any external information which can be brought to help inform this process. In case of manifest contradiction, the different information received is criticized, especially in the use table, where main items are the result of partitioning source data into product groups due to the lack of disaggregated data. Sometimes, it can be necessary to consult the people who participated in its elaboration and to go back to the sources used to obtain them. This is also the time to verify that the concepts used are satisfactory, and that we have a correct image of

the characteristics of the product and its market. Very often, an investigation of this kind is sufficient to resolve the initial contradiction. Otherwise, it would be necessary to determine, together with the people in charge of the coordination, how to carry out the investigations more in-depth; meanwhile, a provisional balance is offered.

Box 16. The supply and use balance of paddy rice using ERETES

SUB in value, benchmark year

Produit:**001001001**
Libellé **paddy**
Campagne:**B 2014** Comptable:**admin**
Origine:**Nationale + Importée** Poste:**Central**

	completed basic price	Transport margins	Trade margins	Net Tax	Non-deductible VAT	Purchaser's Price
TOTAL SUPPLY	1900,000		385,000	-149,000		2136,000
TOTAL USES	1900,000		385,000	-149,000		2136,000
Princ. Market. OUTPUT	1616					
Princ. Non.Market. OUTPUT	284					
Second. Market. OUTPUT						
Second. Non. Market. OUTPUT						
IMPORT CIF						
Tax on Imports						
Transport MARGIN						
trade MARGIN			385			
TAX on export						
TAX on products						
Subsidies on products				-149		
Non deductible VAT						
Intermed. Consumption	1691		385	-149		1927
Purchased Final Cons						
FCEXP NMO Household	284					284
FCEXP NMO Gov						
FCEXP NMONPISH						
GFCF						
Ch. Inv. In-pgress,						
Ch. Inv. Fnshd,						
Ch.Inv. Gds. RESALE						
Ch.inv.MAT &Supp	-75					-75
EXPORTS						

Box 17. Supply and use of FISIM through an example

The following example presents, in a simplified way, the concept of financial intermediation services indirectly measured (FISIM):

A bank has deposits amounting to 100 billion collected from households, paid at an interest rate of 2 per cent. All of these deposits are loaned to non-financial companies at an interest rate of 7 per cent. Two billion are thus paid to households, while 7 billion are received from non-financial enterprises. The 5 billion differences between interest received and interest paid by the banking sector corresponds to the production of intermediation services.

These services are said to be "indirectly measured" because their remuneration is not subject to explicit billing, but is a margin applied to interest rates: it increases the interest earned by the bank and reduces those it pays. The purchase of FISIM is therefore the fact of borrowers as depositors.

The households, to invest their funds, and the companies, to finance themselves, had to resort to the intervention of banks. Each of these two sectors therefore bore a cost, corresponding to the services provided by the credit institutions: administrative management, financial engineering, risk management, etc.

It remains to specify the distribution between FISIM users sold by producers. For each user sector, the service corresponding to the intermediation can be evaluated by difference between the conditions applied by the banks and those that the non-financial agents would practice between them in the absence of intermediation.

One could assume, using the example above that the households would agree to lend to businesses at a rate between 2 per cent and 7 per cent.

If it turns out that the equilibrium rate between supply and demand for funds, in the absence of intermediary, is 5 per cent, we can then evaluate the cost of the intermediation service for each user:

- FISIM purchased by households: (100 billion * 5%) – 2billion = 3 billion ⇨ HFCE
- FISIM purchased by companies: 7 billion – (100 billion * 5%) = 2 billion ⇨ IC

(b) Elaboration of industries accounts

The industry account is a table that reproduces, for each industry, the different transactions that appear in the production and generation of income accounts, then adds the available data related to the employment. Other lines could be added to verify the main economic relationships associated with these data (output and GVA per capita, per capita compensation, technical coefficients, etc.).

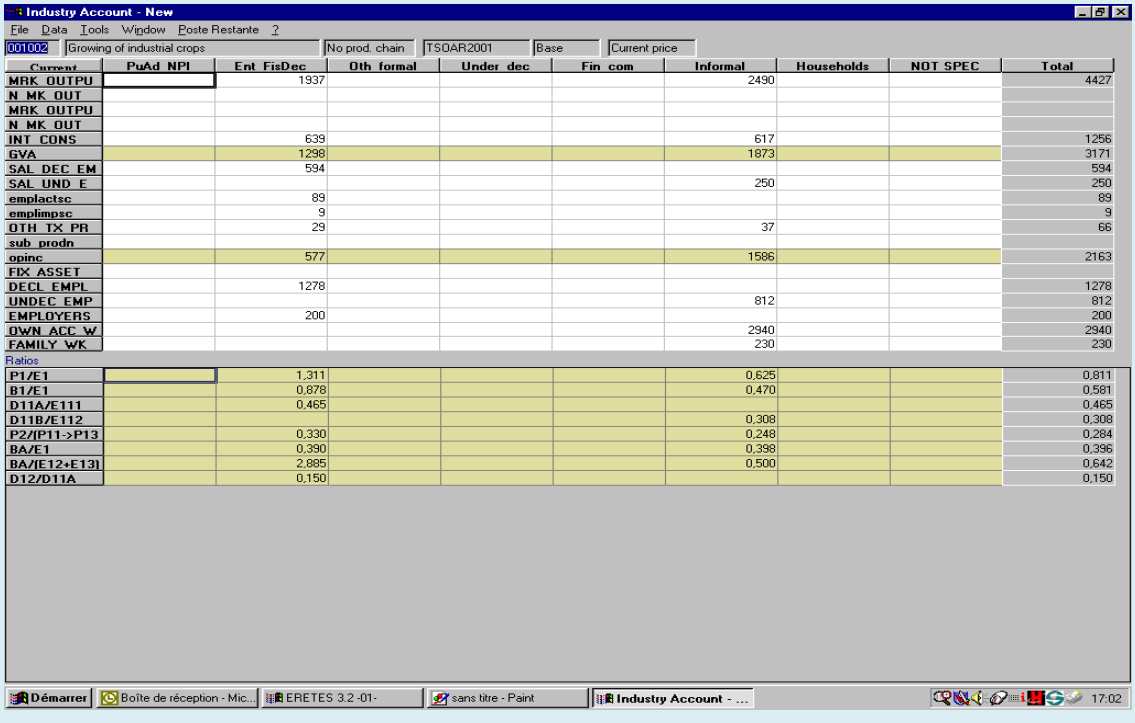
It is recommended to produce each transaction by economic mode of production (formal, informal, under declared, government, NPISH) to facilitate the link with the institutional sectors accounts.

This table represents a very interesting contribution, both for the conduct of the work on the SUT, and for the transposition of these accounts according to the institutional sectors.

But we must be aware that such a picture supposes a totally different management from the one associated with the SUB. Here, there is no balance to be made (as it is common to calculate the operating surplus as a balancing item). On the contrary, it provides an occasion to verify numerous economic coherences, for which some coefficients can be used:

- Intermediate consumption/output
- Output/total employment
- Value added/total employment
- (Gross operating surplus + mixed income)/total employment
- Gross salaries of declared employees/ number of declared employees
- Gross salaries of undeclared employees/ number of undeclared employees
- Mixed income/(number of individual entrepreneurs + family workers)
- Effective social contributions/gross salaries of declared employees.

Box 18. The framework used in ERETES to populate the industry account



The ratios presented above are useful instruments to check the plausibility and credibility of data received. They can be used to assess the quality of information used in the estimation of production and generation of income account of a given industry. An unexpected ratio (too high or too low) must lead to an examination of the data used.

Moreover, the evaluation of data can be made through the relation between the output and the intermediate consumption associated with the productive chains in which the industry is involved (for example the output of the meat industry and the IC supply of livestock).

In some cases, it can also be possible to refer to the fixed capital used (such as vehicles) to evaluate the level of the output of special industries (i.e. transport services). Other checks must be also undertaken such as the links with the labour accounts: Changes in labour productivity are an important indicator for judging plausibility.

In reality, these elements are linked together by technical coefficients, per capita productivity and labour income. All information regarding these coefficients should be sought, and this is where surveys of informal activities can play an essential role, as well as data on income from household surveys.

This search can lead to modify the level of the output, as well as to question the data on employment or on the supply of intermediate consumption in the production chain, and even the value of the coefficients used. This is the time to complete the columns provided in the table: the production attributed to the informal or non-market economy of households, as well

as the proposals for corrections by under-reporting from the economic units responding to the surveys' questionnaires.

Obviously, the question of the level of employment in the industry should be submitted to the person responsible for following this data for the economy as a whole, since this correction will have to be transferred to another industry.

Once the large arbitrations have been decided, the data in the industry account must be completed: the compensation of employees, social contributions and, of course, the level of intermediate consumption.

2. The synthetic phase of balancing SUT

Iterative approach uses alternating rounds of product supply and use balancing and industry account to arrive at final estimates of the three measures of GDP only at the end of the process. At the end of each iteration, the values obtained after working on the SUB and industries accounts are brought together, their quality is verified and they are processed through central systems. The purpose of this work is to check if the original data is to be kept or modified and to produce the next iteration.

It should be noted that it is not possible to know a priori how many iterations must be expected for the analytical elaboration stage. It depends on the experience of the people who are performing the work and on the quality of the available statistic data. That is why it is better to be demanding with quality since the first decentralized phase; otherwise, there will be distortions that are difficult to overcome. This aims to reduce iterations to a suitable number; the last one will be done in a centralized way (to solve the last adjustments).

After the last iteration of the analytical phase, the SUBs and the industries' accounts converge on the set of elements that make up the content of these tables, with the exception of the unresolved differences between supply and demand of intermediate consumption.

The attention will then be concentrated on those differences. This is done in the framework of a table (the absorption matrix) whose dimension could be the same as that adopted for the SUBs and the industries' accounts, but this supposes a level of detail that is very difficult to control. Therefore, it is strongly recommended to reduce the size for the realization of this synthesis work. And the experience shows that a work done contenting with the level 1 of the industries and products is totally satisfactory. Certainly, it will be necessary to organize the transfer to the most detailed level of the decisions taken during the arbitration.

The absorption matrix is completed with the set of tables that make up the SUT, retaking the same dimensions as those adopted. Once the framework has been determined, the data coming from the previous phase is introduced, after an aggregation according to the agreed detail.

At this stage, we try to bring closer the IC supply by product and the IC demand by industry. The objective is to be able to arrive at a unique valuation of the GDP, without losing the quality of the economic aggregates that result from the previous work.

Before undertaking any adjustment operation, it is recommended to carry out a thorough analysis of the situation. It is about defining a synthetic strategy that allows the two objectives that have just been mentioned to be met in the best way.

And sometimes it seems desirable, especially if the economy is complex, or if it is the first elaboration of an SUT, to foresee at the end of this analysis a new research time, in order to clarify the contradictions that are still considered too important, and not immediately launched into arbitration procedures that are necessarily blind. This way we can reduce a large part of the work, since the contradictions found were too important to settle for a simple correction in the margin of the SUB.

(a) Analysis by product

For this analysis, we proceed to read line by line, firstly observing the total difference between supply and demand of intermediate consumption, and then studying the most important cells. We can then outline arbitration hypothesis, without, however, being carried out immediately, since a review of the whole is necessary, which will allow us to see other possibilities.

In the framework of this analysis, it is good to note that there are different types of products:

Some that have very few possible uses.
In general, they are part of a productive chain; in this stage of work, the difference should be small.

- For others, the demand is well localized (food products, for example) in this case any discrepancies mean, without a doubt, an error in the distribution with the final demand.
- And others are to be consumed by all industries (packaging, office supplies, fuel, business services and other services in general, etc.); demand and supply are very difficult to establish in detail. Eventually a specific analysis is possible (as in the case of fuels, for example). Generally, it is in relation to these products that the IC by industry is not sufficiently detailed by statistics, and for which a particular treatment is proposed (application of the RAS method).

(b) Analysis by industry

It is recommended to proceed in the same way with industries. The analysis of the observed gap is more delicate, since a proportion is due to the part of the CI offer that has not yet been allocated. Then it must be verified that the existing reserve (IC Supply) is sufficient to satisfy the demand. But the most important thing is to locate the industries in which there is a risk of a major difficulty. In this case, we can question the technical coefficients, or the level of added value and, therefore, possibly the gross operating surplus); and finally, the output itself.

Box 19. Example of balancing supply and use of a product using an iterative process

"Agriculture and live animals products"

Supply

Output	51 567
Imports	82 82
Transport Margins	8 731
Trade Margins	649
Non-deductible VAT	26
Subsidies	
Other taxes on product	
Imports duties	
Total supply	69 255

Uses

IC	31 243
HFCE	17 848
GFCF	2 380
Change in inventories	1 152
Exports	5 017
Total uses	57 640

Discrepancies	11 615

Iteration 1: after examining the data, the responsible for the population of the balance of agriculture products decides that the HFCE had to be adjusted to take into account the production for own final uses (+ 6,059) and the discrepancies left will be added to the IC (5556 IC of the meat industry on livestock).

Supply

Output	51 567
Imports	8 282
Transport margins	8 731
Trade margins	649
Non-deductible VAT	26
Subsidies	
Other taxes on product	
Imports duties	
Total supply	69 255

Use

IC	36 799
HFCE	23 907
GFCF	2 380
Change in inventories	1 152
Exports	5 017
Total uses	69 255

Discrepancies	0

Iteration 2: Following an examination of the input coefficients and a comparison between formal and informal process of production of meat, the responsible for the population of the meat's industry account decides to accept just 2,647 as additional intermediate consumption on livestock for the informal part of the meat's industry.

Supply

Output	51 567
Imports	8 282
Transport margins	8 731
Trade margins	649
Non-deductible VAT	26
Subsidies	
Other taxes on product	
Imports duties	
Total supply	69 255

Use

IC	28 334
HFCE	23 907
GFCF	2 380
Change in inventories	1 152
Exports	5 017
Total uses	60 790

Discrepancies	8 465

Iteration 3: After the second iteration, the account is no longer balanced. A new discrepancy appeared (8,465) and it has to be allocated to another use or the responsible for the agriculture products balance has to change his supply by checking for inconsistencies in the supply side. After deep investigation, it turns out that consumption of households on livestock for l'Aid has not been estimated in their final consumption. The final decision is to add 8,465 to the HFCE.

Supply

Output	51 567
Imports	8 282
Transport margins	8 731
Trade margins	649
Non-deductible VAT	26
Subsidies	
Other taxes on product	
Imports duties	
Total supply	69 255

Use

IC	28 334
HFCE	32 372
GFCF	2 380
Change in inventories	1 152
Exports	5 017
Total uses	69 255

Discrepancy	0

(c) Arbitration

The synthesis of the matrix is carried out by successive waves of arbitrations, each of them carried out according to the same rigorous procedure: to sweep the matrix line by line and then column by column, if necessary several times, until the assigned objective is completely achieved.

(d) Express the SUT in accordance with the SCN

Some differences may exist between the worktables used and the conventions adopted by the SNA to organize the SUT. On the other hand, the classifications used to carry out the synthesis of the SUT are not necessarily those adopted for publications. Then, the appropriate conversions must be made. Specifically:

- The reconstitution of taxes and duties on imports.
- The c.i.f./f.o.b. adjustment.
- The adjustment for the purchases of residents and non-residents and the foreign trade.
- The distribution by industry of FISIM.

Table 7. Example of balancing the supply and the use of IC

		Initial data							
		GVA ratio	74.4	82	62.4	66.9	40.4	69.6	
			Industries						Init indust IC
Check	IC supply	Product	A	B	C	D	E	F	
14 074	44 877	A	12 862	42		33	17 253	613	30 803
2 066	33 98	B		145			1 187		1 332
0	26	C		4		20	2		26
0	482	D		2	18	402	60		482
0	16 846	E	1948	32			14 866		16 846
-5	0	F					5		5
16 135	65 629	Total	14 810	225	18	455	33 373	613	49 494
		Initial ind output	57 802	1 247	48	1 376	55 958	2 016	
		I GVA	42 992	1 022	30	921	22 585	1 403	

		Final Data							
		GVA ratio	72.4	83	65.4	66.6	39.2	69.4	
			Industries						Total IC/indust
Check	IC supply	Product	A	B	C	D	E	F	
0	44 877	A	13211	42		33	30 978	613	44 877
0	3 398	B		145			3 253		33 98
0	26	C		4		20	2		26
0	482	D		2	18	402	60		482
0	16 846	E	1 948	32			14 866		16 846
0	0	F					0		0
0	65 629	Total	15 159	225	18	455	49 159	613	65 629
		Output IA	54 979	1 323	52	1 364	80 853	2 005	
		GVA	39 820	1 098	34	909	31 694	1 392	

The cells highlighted in bleu are the data drawn from the last iteration of analytical phase while those highlighted in green are the IC of industries by product for which the value has been changed in the synthetic stage to balance the IC supply by product and the IC demand from industries. The ratio used to assess the plausibility of the changes applied is the GVA ratio which remained closer to the initial one calculated through the original data.

(e) Moroccan methodology of balancing SUTs

Moroccan SUTs and all national accounts are populated using ERETES. This tool allows the balancing of SUTs using an iterative and decentralised approach.

In the SUT, the three methods are combined to bring about a unique and well-founded estimate of GDP. As operating surplus is calculated as a residual item in the Moroccan SUT, the income method and the production method give, per definition, the same result for GDP, so in fact only two methods are balanced. The estimates resulting from the two methods are, as far as possible, based on independent sets of source data. Combining these data in an SUT compels the statisticians to use common definitions, harmonised and unique classifications of producers and users, and harmonised and unique classifications of commodities. Under these conditions, corresponding data can be related and compared in a well organised way. Combining the two data sets allows an in-depth analysis of the causes of imperfections and a well-founded correction.

At the start of the process for every entry of the supply and use of a commodity, an estimate based on source data, is available and charged into the database. The estimates are entered in the database of accounts managed by ERETES, with specifications concerning, among others, the relevant accounting year, the data source, the date of its introduction into the base, the commodity code, the industry code and the nature of the operation (production, margin, taxes and duties, import or export, final consumption, VS, GFCF).

In order to make the most appropriate reconciliation between supply and use, time is spent assessing the raw inputs in their own right and making any necessary quality adjustments. Investigations are made to establish if there is consistency between different sources, going back to the primary statistics to conduct verification and cross checking of the material. Where necessary, further specific quality adjustments are also made in the preliminary iterations before the general reconciliation process begins. After checking – in terms of consistency, validation and plausibility – completing and correcting the data available from different basic sources, the balancing process can begin.

In the search for causes of inconsistencies, it is helpful to carry out a number of plausibility checks. In fact, this is a search for, at first sight, unexpected values of ratios like volume of output compared to volume of input and labour productivity. It has to be emphasised that the existence of unexpected values of ratios does not mean that, by manner of law, data are wrong. Implausible values of ratios need further analysis, resulting in either a well-founded justification or a well-founded suggestion for adjustment.

Examples of plausibility checks:

- Per commodity: comparing shares of use categories within total supply for subsequent years (e.g. export shares).

- Per commodity: comparing the VAT collected with the theoretical VAT.
- Per industry: index of productivity of labour (ratio of volume index of value added and index of labour input).
- Per industry: comparison of share of labour income in total value added for subsequent years.

The organization of balancing is done in a decentralised way. Each accountant involved in the elaboration of the SUT is allotted a specific tranche of the 100 industries and 278 products to balance according to his competence about the product/business area. The partition of industries and products is done in respect of some parameters:

- The industries that depend mainly on government, NPISHs and financial corporations can be entrusted to the people in charge of the accounts of those institutional sectors.
- The industries in which a monopoly is exercised, are assigned to those who are responsible for preparing the accounts of the corresponding company.
- The products destined mainly for investment are entrusted to the person in charge of the matrix of the GFCF.
- Breaks in the productive chains are rare, for example agriculture is brought to industries that transform agricultural products.

Discrepancies between total demand and total supply are analysed and well-founded adjustments are made in order to fulfil the basic identities of the SUT. Balancing aims at balancing the supply and use for every product group by making adjustments on main variables on both the supply and use sides. Adjustments on one product group affect other product groups resulting in a process of continuous interaction. The balancing ends with a column-wise check of the results. Due to balancing of the commodities supply and use, the intermediate consumption matrix shows, in most cases, new imbalances between:

- The industries' total intermediate consumption of a given product and the supply of intermediate consumption from the SUB relating to the same product.
- The total intermediate consumption for a given industry by product and the intermediate consumption through the industry account.

Globally, the final synthesis on the intermediate consumption table is performed subsequently as follows:

- Confrontation of the total intermediate consumption by product (demand side) to that retained in the corresponding SUB (supply part).
- Comparison of the total intermediate consumption by industry (column of the table) to that retained in the industry accounts.
- Balancing of the IC matrix is done at less detailed level of the classification.
- The gap between supply and demand is broken down pro-rata between branches while being careful not to deviate too much from the original key ratios (IC/output, VA/output, Productivity by industry…).
- The end result is that, when all other checks, plausibility assessments and corrections have been made, the final reconciliations involve an adjustment of intermediate consumption in the various industries.

When the balancing is completed, the SUT produce a set of consistent and coherent data of supply and use of goods and services on a

detailed level. These results are discussed and validated in a small group process managers and experts. Inputs for this discussion are among others:

- Macro-economic results and their plausibility.
- Production, intermediate consumption and value added by industry.
- Expenditures by product (on an aggregated level).
- Revisions in relation to previous estimates.
- Explanations of the most remarkable results.

Table 8. Numerical example of balancing SUT

Unbalanced SUT																							
Supply table at basic prices, transformation to purchasers' prices										Use table at purchasers' prices													
	AGR	MMC	SER	DP	IMP	SUPbp	TTM	TLS	SUPpp		AGR	MMC	SER	TIC	FCH	FCN	FCG	GFCF	INV	EXP	TOTfin	TOTpp	bridge column
AGR	260	2	0	262	154	416	109	5	530	AGR	55	174	15	244	59	0	0	1	-1	224	283	527	3
MAN	13	3185	357	3555	3368	6923	1130	394	8447	MAN	101	2021	654	2776	1228	0	91	515	14	3831	5679	8455	-8
CON	1	880	45	926	16	941	0	83	1024	CON	3	262	198	463	5	0	6	537	0	21	569	1032	-8
TTC	5	151	2316	2472	734	3206	-1240	30	1996	TTC	6	108	662	776	214	9	5	67	0	923	1218	1994	2
FBS	5	80	2820	2905	552	3457	0	91	3548	FBS	21	435	1618	2074	780	0	36	168	0	495	1479	3553	-5
OSE	3	25	2229	2257	166	2423	1	30	2454	OSE	2	35	222	259	547	46	1534	12	2	51	2192	2451	3
TOT	287	4323	7767	12377	4990	17366	0	633	17999	TIC	188	3035	3369	6592	2833	55	1672	1300	15	5545	11420	18012	-13
										OTLS	-7	2	3	-2									
										COE	27	609	2544	3180									
										CFC	37	205	829	1071									
										NOS	43	472	1022	1537									
										GVA	99	1288	4398	5785									
										TOT	287	4323	7767	12377									
										Row check	0	0	0	0									

Balanced SUT																							
Supply table at basic prices, transformation to purchasers' prices										Use table at purchasers' prices													
	AGR	MMC	SER	DP	IMP	SUPbp	TTM	TLS	SUPpp		AGR	MMC	SER	TIC	FCH	FCN	FCG	GFCF	INV	EXP	TOTfin	TOTpp	bridge column
AGR	258	2	0	260	154	414	109	5	528	AGR	55	174	15	244	59	0	0	2	-1	224	284	528	0
MAN	13	3185	357	3555	3368	6923	1130	394	8447	MAN	101	2021	654	2776	1228	0	91	515	14	3823	5671	8447	0
CON	1	890	45	936	16	952	0	83	1035	CON	3	262	198	463	5	0	6	540		21	572	1035	0
TTC	5	151	2316	2472	729	3201	-1240	30	1991	TTC	6	108	662	776	211	9	5	67	0	923	1215	1991	0
FBS	5	80	2825	2910	552	3462	0	91	3553	FBS	21	435	1618	2074	780	0	36	168	0	495	1479	3553	0
OSE	3	25	2229	2257	166	2423	1	30	2454	OSE	2	35	222	259	550	46	1534	12	2	51	2195	2454	0
TOT	285	4333	7772	12390	4985	17375	0	633	18008	TIC	188	3035	3369	6592	2833	55	1672	1304	15	5537	11416	18008	0
										OTLS	-7	2	3	-2									
										COE	27	609	2544	3180									
										CFC	37	205	829	1071									
										NOS	40	482	1027	1549									
										GVA	97	1298	4403	5798									
										TOT	285	4333	7772	12390									
										Row check	0	0	0	0									

4. SUT the suitable framework to assess the exhaustiveness of national accounts

A. Introduction

An important aspect in the quality of the national accounts consists in their complexity, which requires including in the calculations all the economic activities, both reported and non-reported. This is quite difficult to achieve due to the wide spectrum of economic activities, some of which are deliberately concealed by the producers. The complexity of national accounts leads to the deviations of the most important macroeconomic indicator, namely the Gross Domestic Product (GDP). The underestimation of GDP creates an unclear picture of the economy, impeding the international comparability which has a major importance, especially when poverty is measured by the GDP per capita.

The study and assessment of non-observed economy is important seeing its impact on the economic processes, specifically the aspects related to fiscal evasion, illegal benefits, labour force market and income distribution. It also affects the quality of statistical data, especially those connected with GDP and macroeconomic aggregates. The assessment of non-observed economy elements becomes a stringent necessity because the lack of estimations by official statistics leads to alternative estimations, many of which do not correspond to the international standards and are not performed by professionals.

Taking the above into account, one of the main concerns of the national accountants constitutes the identification (according to international standards) of the activities that bring incomes beyond the coverage of statistical or financial observation.

Complete coverage of economic production is a vital aspect of the quality of national accounts. This exhaustiveness is hard to achieve because of the difficulties in accounting for certain types of production activities.

Activities that are missing from the basic data used to compile the national accounts because they are underground, illegal, informal, household production for own final use, or due to deficiencies in the basic data collection system are referred to as non-observed economy (NOE), including them in the national accounts is referred to as measurement of the NOE.

The non-measured economic transactions lead to imperfection and imbalance of accounts. For example, household expenditures on goods and services produced underground may be measured because the purchasers have no reason to hide their purchases, whereas the corresponding production activities are not reported by the producers.

In this purpose, the methodology of the System of National Accounts adopted by the United Nations, version 2008 (SNA, UN, 2008) and the recommendations reflected in the manual "Measurement of non-Observed economy",

2002 issue (both used internationally), give the possibility to statisticians which compile the national accounts, and also to users of macroeconomic indicators, to outline precisely the definitions used, understand their essence, and finally, speak the same language.

B. Production boundaries

Production is one of the key concepts of the national accounts. The rules that have been developed to "determine" what is to be included as production and what is to be excluded, is referred to as the production boundary. This determines the scope of the most current and capital transactions in the national accounts. First, the production boundary determines what is to be included in the accounts as output. Secondly, because the 2008 SNA recognises only the uses of produced goods and services, the elements of intermediate consumption, and thus, value added, are also governed by the production boundaries.

The production boundary has ramifications that extend considerably beyond the production account itself. The production boundary determines the amount of value added recorded and hence the total amount of income generated by production. The range of goods and services that are included in household final consumption expenditures, and actual consumption, is similarly governed by the production boundary.

Considering the wide-ranging aspects of the production concept, the quality of national accounts is to a large extent determined by the exhaustiveness of the GDP estimates. To achieve exhaustiveness, the first step is the delineation of what should, and should not be included in the national accounts as production. In the first place, a boundary must be defined between those activities that are regarded as productive in an economic sense, and those that are not. The second step is to define the boundary around the economic production that needs to be included in the national accounts.

With respect to productive activities, the 2008 SNA introduces two fundamental boundaries: the general production boundary and the SNA production boundary.

General production boundary draws the line between economic and non-economic production. The economic analysis of production is mainly concerned with activities that produce outputs that can be delivered or provided to other institutional units. Unless outputs are produced that can be supplied to other units, either individually or collectively.

Therefore, "Production is understood to be a physical process, carried out under the responsibility, control and management of an institutional unit, in which labour and assets are used to transform inputs of goods and services into outputs of other goods and services. All goods and services produced as outputs must be such that they can be sold on markets or at least be capable of being provided by one unit to another, with or without charge".[6]

All goods and services produced as outputs must be such that they can be sold on markets or at least be capable of being provided by one unit to another, with or without charge.

6. SNA 2008, para. 1.40.

For an activity to be treated as productive, the following conditions must be met:

- There must be a link between the activity and an institutional unit. The activity must be carried out under the control and responsibility of an institutional unit exercising ownership rights on what is produced. Consequently, purely natural processes without any human involvement or direction are excluded. For example, the unmanaged growth of fish stocks is outside this general boundary, whereas fish farming is included. There must be marketability resulting in outputs capable of being exchanged. Marketability also implies observance of the so-called third-party criterion, which states that an activity may be deemed economically productive only if it can be performed by a person other that the one benefiting from it. By this criterion, basic human activities such as eating, drinking, sleeping taking exercise, etc. are excluded, whereas services such as washing, preparing meals, caring for children, the sick or aged fall within this general boundary because they can be exchanged between the different units.

The SNA production boundary is more restricted than the general boundary and describes the range of productive economic activities that should be included in the GDP estimates. "The SNA includes within the production boundary all production actually destined for the market, whether for sale or barter. It also includes all goods or services provided free to individual households or collectively to the community by government units or NPISHs".[7] However, the household activity services provided for own-final use (except services provided by owner-occupied dwellings and services provided by the personnel hired in households) does not reflect the production account. Apart from that, the production boundaries of national accounts coincide with the general production boundaries.

C. Non-observed economy

A leading cause of imperfections in national accounts is the omission of activities that are outside the scope of the regular statistical inquiries and data collection systems (such as surveys of enterprise accounts, international transactions reporting systems, merchandise trade statistics). These statistical inquiries are predicated on the existence of a structured system where businesses adhere to government regulations regarding the payment of taxes, the registration and operation of a business entity, and the provision of certain benefits to their workers. Therefore, some activities may be omitted because they are illegal or hidden from the authorities. However, some activities may also be omitted because they are undertaken by households – and not business units – that are not required to adhere to the regulations that may be applied to businesses.

According to the SNA, the main "areas" for which problems of statistical measurement exist are described as "non-observed economy" (NOE). It comprises five broad categories of activities, namely informal, underground, illegal and own-account.

1. Informal activities

The 2008 SNA and the Handbook on the non-observed economy both follow the international definition of the informal sector set by the

7. Ibid.

International Conference of Labour Statisticians 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…".

The informal sector therefore reflects economic activities that are undertaken by individuals and households as a source of income and are not formally registered as a separate business enterprise. Informal activities provide goods and services that may be perfectly legal as the goal may not necessarily be to evade taxes and social security contributions, or to bypass government regulations. However, in the process, these activities may in fact bypass regulations and avoid taxes.

Informal activities are therefore characteristically small-scale in nature with few or no employees.

The informal sector is considered a subset of the household sector and the assets associated with informal activities are usually not differentiated from household consumer durables. Therefore, the activities associated with the informal sector relate mainly to transactions in goods and services (trade, travel, transport), and current transfers.
It should be noted that informal activity is not a perfect subset of the non-observed economy and some informal activities may be covered as part of the regular statistical inquiries.

2. Underground activities

The 2008 SNA identifies underground activities as activities that are legal and productive in an economic sense but are concealed from the authorities for the following reasons:

- To avoid the payment of taxes and social security contributions.
- To avoid having to meet certain legal standards such as minimum wage, maximum hours, safety or health standards.
- To avoid complying with certain administrative procedures.

Underground activities may therefore include undeclared transactions (relating to production or income), overstated expenses for tax purposes, and non-reporting of employees or compensation paid.

3. Illegal activities

The 2008 SNA explicitly states that illegal actions are treated the same way as legal actions when the institutional units involved enter the actions by mutual agreement. They are defined as those productive activities that generate goods and services forbidden by law or that are unlawful when carried out by unauthorised producers.
It notes that differences in the definition of illegal transactions between economies or within an economy over time would cause inconsistencies in the international accounts if illegal transactions were omitted.

4. Household production for own final use

Production of goods and services for own final use by household members is a significant part of total production in many countries. It comprises:

- Household production of goods for own final use, including crops and livestock, production of other goods for own consumption.
- Construction of own houses and other own-account fixed capital formation.
- Owner-occupied dwelling services.
- Paid domestic services, i.e., by employment of paid domestic staff.

5. Production missed due to deficiencies in data collection system

This problem area is an inseparable aspect of exhaustiveness. It comprises all the productive activities that should be accounted for by the basic data collection program but are missed due to statistical deficiencies. It is sometimes referred to as the statistical underground, in contrast to the economic underground.

The reasons why activities may escape direct measurement by the basic data collection system can be grouped into the following three main categories:

- Under-coverage of enterprises: Enterprises, or parts of them, are excluded from the data collection program.
- Non-response by enterprises: Enterprises are included in the sample, but no data are collected from them.
- Under-reporting by enterprises: Data are obtained from enterprises but are misreported by the respondent.

The order enlisting the different areas of non-observed economy does not correspond to their relevance. In reality, their volume and significance vary from one country to another. For example, the informal sector could be insignificant in the developed countries, and quite relevant in developing countries.

The size of the informal sector – especially in developing countries – is of interest to policymakers because a large or growing sector is associated with increasing poverty. Further, the sector may not respond the same way to the macroeconomic stimuli designed for the formal economy. Moreover, the informal sector plays a significant role in employment creation, production and income generation. Informal sector employment is a necessary survival strategy in countries that lack social safety nets such as unemployment insurance, or where wages and pensions are too low to cover the cost of living.

Box 20. Eurostat's tabular approach to exhaustiveness, descriptions of the non-exhaustiveness types (N1 to N7)

N1	Producer should have registered (underground producer)	• Producer fails to register in order to avoid tax and social security obligations. These are often small producers with turnovers exceeding the thresholds above which they should register their income. • Type N1 does not include producers that fail to register because they are engaged in illegal activities. • Type N1 does not include all underground activities, some of which are associated with type N6.

N2	Illegal producer that fails to register	• N2 covers activities of producers that avoid registration entirely. • N2 excludes illegal activities by registered legal entities or entrepreneurs that report (or misreport) their activities under legal activity codes.
N3	Producer is not obliged to register	• Producer is not required to register because it has no market output. Typically, these are non-market household producers involved in: (a) Production of goods for own consumption or for own fixed capital formation; (b) Construction of and repairs to dwellings. • Producer has some market output, but it is below the level at which the producer is expected to register as an entrepreneur.
N4	Registered legal person is not included in statistics	• The legal person may not be included in the statistics for a variety of reasons, such as: the business register is out of date or updating procedures are inadequate; the classification data (activity, size or geographic codes) are incorrect; the legal person is excluded from the survey frame because its size is below a certain threshold; etc.
N5	Registered entrepreneur is not included in statistics	• A registered entrepreneur may not be included in the statistics for many reasons such as: the administrative source with lists of registered entrepreneurs may not always pass on complete or up-to-date lists to the statistical office. • Even if there is a regular flow of accurate and comprehensive information from the administrative source to the statistical office, the registered entrepreneur may not be included in the business register for several reasons (see those given under N4).
N6	Misreporting by the producer	• Misreporting invariably means that gross output is under-reported and intermediate consumption is over-reported in order to evade (or reduce) income tax, value added tax or social security contributions. • Misreporting often involves: the maintenance of two sets of books; payments of envelope salaries which are recorded as intermediate consumption; payments in cash without receipts; and VAT fraud.
N7	Statistical deficiencies in data	The following list is not comprehensive, but these topics should be investigated for non-exhaustiveness: • Handling of non-response • Production for own final use by market producers • Tips • Wages and salaries in kind • Secondary activities. Clearly, not all statistical deficiencies result in the under-estimation of GDP (the focus here has been to illustrate those areas which are likely to lead to non-exhaustiveness in the NA).

D. Coverage of the NOE to ensure national accounts exhaustiveness

Complete coverage of economic production is a vital aspect of the quality of national accounts. The goal of statisticians is to measure all the non-observed activities covered in the production boundaries of the system of national accounts, in order to reach a better level of reliability and coverage of the GDP.

Achieving exhaustiveness of national accounts is a challenging task; measuring NOE is obviously a very difficult endeavour because of the nature of what is being measured and, consequently, the approximations made in the measurement process. In fact, the non-observed economy is difficult to measure due to its own elusive nature, which makes information about it, beyond the available data from traditional statistical sources and national registry offices. In terms of its theoretical definition, the non-observed economy is the segment of production fulfilled by areas that cannot be directly estimated through the traditional economic-statistical system.
In practical terms however, the non-observed economy is the segment of production that must be calculated through adjustments for non-registration of jobs from employed workers and self-employed ones, under-reporting of remunerations, smuggling, under-reporting of production for fiscal evasion, illegal production and weaknesses in statistical coverage. Thus, non-inclusion of the non-observed economy in the GDP estimation would lead to serious omission errors not allowing correct analysis of the national economic system development and its neat comparison with other economies. GDP is certainly a key aggregate statistic that is widely used as the most frequently quoted indicator of economic performance and, as defined within the SNA, is in simple terms the amount of value added generated by production.

Obviously, the appropriate calculation of GDP is essential to capture all kinds of existent production of goods and services, within the production boundary, that represents a genuine productive process for which there is an effective market demand. The space of production within the production boundary comprises two major groups that must be included in order to achieve GDP exhaustiveness. First, that of the observed economy which is the production space directly reported by statistics through economic censuses and/or annual surveys and enquiries to productive units of different economic activities, and second that of the non-observed economy which is the production space which could not be directly reported by the traditional economic-statistical sources such as the previously described. However, even though, in most countries the NOE production is estimated and included in the official GDP. National accountants have traditionally sought to incorporate undeclared production, incomes and expenditures by reconciling income, expenditure and output estimates of GDP and by using different methods to cover all production falling within the SNA boundary and therefore to ensure that GDP estimates are exhaustive.

E. Measurements methods of the non-observed economy

Currently, there are two broad measures that are used to derive estimates for non-observed activity:

(a) Direct approaches based on surveys;
(b) Indirect approaches based on statistics from related sources and macro-economic estimation techniques.

Box 21. The 1-2-3 survey

The 1-2-3 survey was first used in Mexico at the end of the 1980s. Initially designed to study the informal sector (Roubaud, 1992), the 1-2-3 survey was gradually extended to also measure and monitor poverty and governance. Over the last few years, the 1-2-3 survey has spread to many countries in Africa, Asia and Latin America.

The first two phases of a 1-2-3 survey are a labour force survey and an informal sector survey. The third phase is an income and expenditure survey, administered to a subsample of (or all) households identified in phase 1, which is designed to estimate the weights of the formal and informal sectors in households' consumption, by product and type of household.

The household survey phase of the 1-2-3 survey has been specifically designed to measure the informal sector and employment issues. The questionnaire asks each member of the labour force about the number of persons employed in the enterprise, the type of registration held (depending on national legislation) and, for employers and own-account workers, the type of accounts and other information. The information is collected both for the main and the second job. This provides flexibility in the operational definition of the informal sector, which can be adjusted to the purpose of each survey (national definition, international comparison, academic studies). It is then possible to produce information on the size of total employment in the informal sector and, by using the question on status in employment to identify the number of employers and own-account workers, on the number of informal economic units. This latter information is crucial to selecting a representative sample of informal units for the informal sector survey phase.

Apart from informal sector employment, the questionnaire provides for the measurement of informal employment in the formal sector by using a set of questions about the type of protection linked to jobs: type of labour contracts, payslips, and different kinds of allowance (according to national circumstances). As with the informal sector, the household survey phase questionnaire provides flexibility as to the criteria of informality to be chosen with respect to international recommendations.

The second phase of the survey is carried out among informal sector entrepreneurs identified during the first phase. It is designed to answer precise questions regarding the role of the sector in the economy, as well as its actual and potential contribution to improving living conditions. The standard questionnaire is an individual form comprising seven modules, to which additional modules can be added according to national priorities), as follows:

Module A: Characteristics of the establishment
Module B: Labour force
Module C: Production
Module D: Expenditure and costs
Module E: Customers, suppliers, competitors
Module F: Capital, investment and financing
Module G: Problems and prospects
Module S: Social insurance (optional).

The survey on consumption (phase 3) of the 1-2-3 survey is basically an income and expenditure survey conducted on a subsample of households surveyed in the household survey phase. It is designed not only to determine the level and structure of household consumption but also to estimate the share of the informal sector in household consumption (and in household fixed capital formation).

1. Direct approaches

Direct approaches based on surveys may have difficulties in covering activities that may also be hidden or illegal. In fact, of all different areas of the non-observed economy, it is to the informal sector that this tool is best suited direct approach is relevant for informal sector than other kind of non-observed economy (illegal, etc.). However, it is particularly difficult to find a reliable survey frame for sampling. Furthermore, complete coverage of the informal sector without omissions or duplications is difficult; Many informal sector enterprises are hard to identify and locate because they are activities conducted inside the owner's home (such as tailoring and food processing) or without fixed location (such as construction, transport, and ambulant trade). In order to overcome these difficulties, the direct survey (establishment survey) on informal sector has been replaced by the mixed household-enterprise survey.

In general, a mixed household-enterprise survey has two phases. It is conducted in such a way that the sampling frame of informal sector units (second phase) is obtained from a household survey (first phase). Questions that can identify the informal sector production units are inserted in the household survey questionnaire for this purpose. The second phase is conducting survey covering the informal sector production units to collect information about working conditions and economic performance of those units. The sampling units of the first phase of the survey are individuals, while those of the second phase are the informal sector production units, hence the reference to "mixed" survey.

2. Indirect approaches

Indirect approaches, alternatively called "indicator" approaches, are mostly macroeconomic in nature. These are in part based on: the discrepancy between national expenditure and income statistics; the discrepancy between the official and actual labour force; the "electricity consumption" approach; the "monetary transaction" approach; and the "currency demand" approach among others.

(a) Discrepancy between national expenditure and income statistics

If those working in the non-observed economy were able to hide their incomes for tax purposes but not their expenditure, then the difference between national income and national expenditure estimates could be used to approximate the size of the non-observed economy. This approach assumes that all components on the expenditure side are measured without error and constructed so that they are statistically independent from income factors.

(b) Discrepancy between official and actual labour force

The labour input method is the principal global verification method for compilation of adjustment for exhaustiveness. It is based on comparing labour force statistics obtained from population censuses, labour force surveys or other household surveys covering employment, with employment statistics obtained from establishment censuses or surveys that cover informal activities in addition to employment data from social insurance registrations or fiscal records. The first type of source, also referred to as the 'exhaustive' source, is assumed to capture all forms of employment (formal and informal) from which statistics based on the second type of source that provide statistics on 'registered' or 'formal' employment, can be

subtracted. The estimates from the population census or labour force survey are always larger than those from the economic census, establishment survey or administrative records, because the latter do not capture employment outside formal establishments. However, they tend to produce statistics on jobs, not on persons employed. Thus, depending on the extent of multiple job holding and the sub-categories of workers compared, the residual balance obtained is used as a proxy of total informal employment or of employment in the non-official economy.

Compilation of reliable adjustments requires detailed labour force data, including employment breakdown by industry and size group of employer, capacity to calculate full time equivalent employment, and output and value added per capita ratios by industry and size group.

(c) Electricity approach

Kaufmann and Kaliberda (1996) endorse the idea that electricity consumption is the single best physical indicator of overall (official and unofficial) economic activity. Using findings that indicate that electricity-overall GDP elasticity is close to one, these authors suggest using the difference between growth of electricity consumption and growth of official GDP as a proxy for the growth of the NOE. This method is simple and appealing, but has many drawbacks, including:

- Not all NOE activities require a considerable amount of electricity (e.g. personal services) or they may use other energy sources (such as coal, gas, etc.), hence only part of the NOE growth is captured.
- Electricity-overall GDP elasticity might significantly vary across countries and over time.

(d) Transaction approach

Using Fischer's quantity equation, Money*Velocity = Prices*Transactions, and assuming that there is a constant relationship between the money flows related to transactions and the total (official and unofficial) value added, i.e. Prices*Transactions = k (official GDP + NOE), it is reasonable to derive the following equation Money*Velocity = k (official GDP + NOE). The stock of money and official GDP estimates are known, and money velocity can be estimated. Thus, if the size of the NOE as a proportion of the official economy is known for a benchmark year, then the NOE can be calculated for the rest of the sample. Although theoretically attractive, this method has several weaknesses, for instance:

- The assumption that k would be constant over time seems quite arbitrary.
- Other factors like the development of checks and credit cards could also affect the desired amount of cash holdings and thus velocity.

(e) Currency demand approach (CDA)

Assuming that informal transactions take the form of cash payments, in order not to leave an observable trace for the authorities, an increase in the size of the NOE will, consequently, increase demand for currency. To isolate this "excess" demand for currency, Tanzi (1980) suggests using a time series approach in which currency demand is a function of conventional factors, such as the evolution of income, payment practices and interest rates, and factors causing people to work in the NOE, like the direct and indirect tax burden, government regulation and the complexity of the tax system. However, there are several problems associated with this method and its assumptions:

- This procedure may underestimate the size of the NOEbecause not all transactions take place using cash as means of exchange.
- Increases in currency demand deposits may occur because of a slowdown in demand deposits rather than an increase in currency used in informal activities.
- (iii) It seems arbitrary to assume equal velocity of money in both types of economies;
- (iv) The assumption of no NOE in a base year is arguable.

(f) Multiple Indicators, Multiple Causes (MIMIC) approach

The MIMIC method considers several causes for the existence and growth of NOE throughout time. The empirical method used is based on statistical theory for non-observed variables, which considers multiple causes and multiple indicators for the phenomenon to be measured, and which is not observed. In the estimation, an approach of the analysis of factors is used to measure shadow economy as a non-observable variable throughout time. The method is based on the idea that shadow economy – non-observed variable, called by statistics latent variable – is caused by a set of factors (observed) and, in turn, induces or causes another set of variables, called indicative variables (which are also observed). Based on the idea that there is a linear relationship between causing variables and shadow economy, and among NOE and the caused (or indicative) variables, it is possible to evaluate the evolution of the variable of interest based on the estimation of this relationship.

(g) Use of Fiscal Data

Audits investigating tax compliance are important sources of data for confrontation or compilation, although there are often problems in obtaining access to these data at individual record level.

Tax audit data also have a part to play. Quantitative surveys of tax evasion are unlikely to yield reliable results because of the delicate nature of the subject, even if anonymity is guaranteed. Tax audits, by their very nature, are more compelling than surveys. Enterprises are obliged to provide their complete accounts, not simply information derived from them. However, because they are designed for tax auditing rather than for statistical purposes, tax audit samples have limitations for estimating non-exhaustiveness, typically including the following.

- The definitions used may not be consistent with SNA.
- The audits do not detect all undeclared income, only what the auditors can find based on their examination of the accounts.
- The audits are usually clustered in certain activity sectors and/or geographic areas.
- The audits are rarely selected on a probability basis as they focus on targeted sub samples that are not representative of the population.
- The audits cannot collect data on illegal activities.
- The audits provide point estimates rather than time series data.

Nevertheless, in the absence of better sources, tax audit samples can provide useful information on some types of non-observed activities, in particular those associated with underreporting.

(h) Commodity Flow Methods

The commodity flow method involves balancing total supplies and total uses of individual products. It is used to estimate the output of a commodity by balancing the supply and use of that commodity, based on the following equation:

Output + Imports = the sum of all intermediate consumption, final consumption, changes in inventories, gross fixed capital formation, and exports

This method is effective if a product is primarily used for one or a limited number of uses, and if accurate data on these uses are available.

Box 22. Labour force survey-based adjustments

The Italian National Statistical Office (ISTAT) pioneered the approach of using labour force survey data to estimate the unrecorded economy. The essence of this approach is to determine the total labour inputs into a certain production activity. A suitably designed household labour force survey (HLS) can provide necessary information for measuring the extent of unrecorded activities. The procedures and requirements for implementing this method are:

Establishing total labour inputs: The total labour inputs in a certain activity are determined using HLS data that are supplemented, if needed and feasible, with demographic and administrative sources on labour participation. In order to allow estimation at a detailed level, the HLS should ask questions about the kind of activity, hours worked, and size of employer(s).

Establishing labour inputs underlying the production covered in business surveys: The business surveys that collect data on production should also collect data on labour inputs (number of employees/jobs, hours worked, etc.).

Ensuring that both sources provide comparable labour input data: The information about labour inputs collected in both the HLS and business surveys should allow derivation of data on labour inputs in standard and comparable labour input units, such as hours worked or full-time equivalent employment.

Determining labour participation not covered in business surveys: The labour inputs data from business surveys are compared with the labour data from the HLS to determine labour participation not covered in business surveys. If a business survey does not cover the total activity (e.g., excludes establishments below a certain cut-off size) then, by definition, the HLS should have higher labour inputs. Any discrepancies should be evaluated for shortcomings/bias in the measurement of employment in both sources. The excess of total labour inputs derived from HLS compared to the labour inputs underlying the production covered in business surveys thus provides a measure of unrecorded production. However, employment that escapes both sources will still be left out.

Determining output and value added per labour unit: In order to convert the labour inputs into measures of output and value added, information on output and value added per labour unit is needed. The determination of these ratios depends on several factors. Some important steps include:

- Analysing the characteristics of production units to which the missing employment belongs and investigating the causes of missing employment.
- Deriving output and value added per labour unit on the basis of ad-hoc surveys/studies.
- Using available data from business surveys, if conducting ad-hoc studies was not feasible.
- Determining the ratios at as detailed a level as allowed by the availability of data.

(i) Supply-based adjustments

This method relies on information on the supply of inputs that are used in producing goods and services. Inputs may be a bundle of primary raw materials, just one major raw material, labour, land, fixed capital stock, etc. If data on supply of one or several inputs used in a certain production activity are available, the total production of the activity that uses these inputs can be estimated.

Input-output and input-value added ratios are needed to calculate output and value added estimates from the input data. Preferably, these ratios should be obtained for the current period through ad-hoc surveys to account for changes in productivity or relative prices of inputs and outputs. If ratios from the past are used, it is recommended to derive first the volume measures of output and value added. Fixed ratios from previous periods should not be applied to current values in a later period because of changes in the relative prices. The volume measures can be converted to current values by using appropriate price indicators.

(j) Demand-based adjustments

Demand-based adjustments aim at determining production by using information on specific uses of goods and services. This method relies on data on uses of goods and services. The indicators could be any uses of goods and services that can sufficiently describe their production. They could be household final consumption expenditures of a certain commodity (e.g., health and personal services), uses of major products as raw materials (e.g., processing of agricultural products), exports (e.g., major export commodities), or any administrative data indicating demand for a product (e.g., motor vehicle registrations, building permits, etc.).

It is important to note that demand indicators are usually segmentary. In most cases, only data on one or a limited number of major uses are available. The export of a commodity that is mainly exported does not cover domestic uses of that commodity. Likewise, household consumption of personal services does not cover other uses, such as uses by producers and exports (but may include imports i.e., expenditures abroad by households). Therefore, compilers should take into account other uses of the same product. There are also differences between valuation of uses and output. All uses are valued at purchasers' prices, while outputs may be valued at basic or producers' prices.

After a measure of output is derived, ratios (output/value added) are needed to calculate value added estimates.

(k) Income-based adjustments

Data on some categories of income are available through administrative sources and can be used to obtain an indication of production covered by the administrative system. Income taxes paid by self-employed persons (or private entrepreneurs) or social security contributions paid by self-employed persons are often readily available. However, further adjustments are necessary to account for activities outside the tax scope and under-reporting of incomes in the tax files.

(l) Supply and use framework

The supply and use framework provides a detailed basis for analysing industries and products through integrated, detailed and systematic breakdown of (a) goods and services account, showing total resources (output and imports) and disposition of goods and services (intermediate consumption, final consumption,

changes in inventories, gross fixed capital formation, acquisition less disposals of valuables, and exports); (b) the production account, showing output, intermediate use of goods and services, and value added; and (c) the generation of income account, showing value added and its component primary incomes generated in the process of production. The supply and use tables show two types of balances:

- For each industry, output equals intermediate consumption plus value added.
- For each product, total supply equals total uses.

Discrepancies between these balances lead to imputations of the difference to the items that are missing or the estimation of which is least firmly based. These adjustment factors can be used in the national accounts compilation over the interval following the compilation of the latest supply and use tables. However, the effectiveness of such methods of estimation depends on the extent to which corrections can be and have been made to the source data for under-reporting, non-response, and bias.

Moreover, commodity flow methods will not capture aspects of economic activity that fail to be recorded in the measurements of both supply and use.

In recent years, the use of supply and use tables as a statistical tool in the compilation of GDP estimates has been increasing. Particularly, this framework facilitates:

- Identifying gaps and inconsistencies in the basic data sources.
- Filling gaps by calculating estimates as a residual.
- Cross-checking and reconciling as well as improving the consistency, plausibility, and completeness of the estimates for supply and uses.
- Calculating estimates for periods for which less detailed and/or less reliable data are available by using coefficients and information from benchmark tables.

It should be emphasized that a supply and use framework improves the overall quality of the GDP measurement even if estimates for various unrecorded activities are obtained using the several adjustments described earlier.

Box 23. Adjustments for exhaustiveness for "personal services output"

Supply, Data sources

Structural survey: 363 as principal production of the personal services industry

Informal survey: 2,502 as principal production of the personal services industry

Informal survey: 80 as secondary production of other industry.

Total supply: 2,945 (basic prices)

It is assumed that only producers in the formal sector can charge VAT at the theoretical rate which is 20 per cent (263 * 20% = 72.6); and it is assumed that VAT on personal services is not deductible.

Supply

Output	2 945
Non-deductible VAT	73
Total supply	3 018

Uses, Data sources

Informal survey: 16 as intra IC of personal service industry

Household Living Standards Survey: 5176 as principal

Uses

IC	16
HFCE	5 176
Total uses	5 192
Discrepancies	-2 174

First adjustment

It is well known that personal services activities are very much affected by the phenomenon of under-reporting and informal activity.

Referring to the method of employment, the full-time equivalent employment in personal services activity, from LFS survey, gives 210,000, in the structural survey full-time employment is 20,000, the informal survey gives 120,000, and thus the labour participation not covered in business surveys is equal to 70,000.

If we use the labour productivity in the informal sector (2,502/120,000), the part of the employment not declared by the producer (either formal or informal) would produce 2,502/120,000 * 70,000 i.e. 1,460.

In fact, the adjustment for exhaustiveness gives a production in more than 1,460 that the Moroccan national accountants assign to the household sector.

Supply

	Raw data	Adjustment	Final data
Output	2 945	1 460	4 405
Non-deductible VAT	73	0	73
Total supply	3 018	1 460	4 478

Second adjustment

* The correction of the production by 1,460 has an effect of increasing the intra-consumption on personal services by "9.3365" to keep the same technical coefficients from the informal survey: (16/2,502).

* An in-depth review of the household living standards survey data shows that an amount of 600 consumer expenditure was erroneously classified as personal service CF while referring to domestic services, hence a correction of the CF of – 600.

Uses

	Raw data	Adjustment	Final data
IC	16	9.3365	25.3365
HFCE	5 176	-600	4 576
Total uses	5 192	-590.6635	4 601.3365
Discrepancies	2 174	-590.6635	-123.3365

Final balancing

To ensure the supply and use balance, it was decided to adjust the production by 123.3365 while keeping unchanged the other balance items.

Supply

Output	4 528
Non-deductible VAT	73
Total supply	4 601

Uses

IC	25
HFCE	4 576
Total uses	4 601
Discrepancies	0

F. Moroccan experience in approaching the informal sector

Moroccan experience in approaching the informal sector has gone through three phases:

1. The first phase

This phase dates back to the beginning of the 1980s. National accountants were more interested in estimating the output and the value added of unincorporated enterprises and in their integration into to GDP and other national accounts aggregates rather than looking at the informal aspects of a part of the economy. The informal sector was not yet mentioned in this phase.

The aim was therefore to estimate the output of these enterprises using statistics on labour force involved in the productive activities of the unincorporated enterprises. The principle of the estimation method was based on determining the population employed in unincorporated enterprises as the discrepancy between the data from general census of population and data on labour force from enterprises.

The next step is to estimate the output of unincorporated enterprises based on per capita values for units of labour in small businesses included in data from enterprises.

2. The second phase

This phase is marked by the realization of the first survey on informal sector: "the national survey of localized informal enterprises 1988". But this survey focused only on non-agricultural economic units located in the urban environment and characterized by the absence of accounting, thus ignoring the non-localized units (homeworkers, street vendors, taxi drivers, etc.) and also ignoring informal units located in rural areas. This survey served very little in the work of the national accounts.

3. The third phase: the national survey on the informal sector ENSI

This phase coincides with the reform of the national accounts with the introduction of the 1993 SNA and the establishment of a new base year 1998. National accountants have been involved in thinking about a system of complementary and integrated surveys that can meet national accounts' objective. Thus, it was decided to carry out a specific survey on the informal sector to assess the contribution of the informal economy in creating jobs and value added through mixed household-enterprise surveys. In order to monitor the evolution of this sector, two other surveys were carried out in 2007 and 2014.

Thus, the national survey on the informal sector (ENSI) is a mixed survey (1-2 survey); the first step is a labour force survey which is used to identify the "informal production units" (IUP) through the identification of their owner who are self-employers or for own account workers, while the second step is the survey on the IUP which seeks to assess the economic activities of the non-agricultural informal sector.

Within the framework of surveys conducted in Morocco, the informal sector is defined as all non-agricultural production units without formal written accounting (bookkeeping).

(a) The objectives of the survey

This survey aims to:

- Capture the characteristics and functioning of informal production units and their

relationship with other sectors in the economy.
- Measure the contribution of the informal sector to various aspects of economic and social development, including jobs creation, production, and access to income, human capital formation and mobilization of financial resources.
- Provide a flow of information to the national accounts for the establishment of production and distribution accounts of the informal sector.

(b) The field of investigation

The survey affected all merchant production units that do not have complete accounts to describe their activity.

ENSI was limited to non-agricultural activities. Farms are therefore not subject to the scope of the survey; but commercial and artisanal activities carried out by farmers as secondary activities are taken into consideration.

(c) The survey plan

In order to set up a statistical survey, it is necessary to have a sampling frame that covers the entire population under investigation. Unfortunately, there is usually no list of informal units and countries with a large informal sector often do not have a business register. To overcome this lack of sampling frames, a clear trend has emerged in recent years to study the informal sector through mixed surveys of households and businesses. These surveys are the most appropriate approach when the aim is to collect comprehensive data on the informal sector as a whole and the different elements that make it up. They can cover all entrepreneurs in the informal sector (with the exception of homeless people) and their activities, irrespective of the size of the enterprise, the type of activity and the nature of the workplace and regardless of the type of work. These surveys cover all activities performed as main or secondary job. They may also cover, in particular, activities carried out in the home of the owner or without a fixed place.

In Morocco, this type of survey was adopted to approach the informal sector, and the Labour force survey was used as a basis to access the ENSI sample.

For the needs of the ENSI, the surveyors of the labour force survey fill out a form giving the necessary information (name and surname of the respondent, address of the establishment, provision or not of an accounting ...) on jobs whose professional status is employer, self-employed, home-based worker or managerial employee. This will make it possible to access the informal production units to be observed within the framework of the ENSI (all identified informal production units are surveyed during the ENSI).

(d) Presentation of the questionnaires

For the collection of information during ENSI, two types of questionnaires are established: questionnaire A and questionnaire B.

Questionnaire A: This questionnaire is used to identify informal settlements in the ENSI sample based on information collected during the employment survey. It is to:

- Ensure that the informal units listed by the employment survey are still functioning and update information about them.
- Check if new informal units have been created between the dates of the two surveys (LFS and ENSI).

Questionnaire B: This questionnaire is the "central core" of ENSI. It seeks to collect information on the characteristics and modes of behaviour of informal establishments, employment and working conditions, production, expenditures and charges, the place of activity, equipment and investment.

The results of this survey were used to establish the national accounts of the base years (1998, 2007 and 2014). All collected data from the survey are loaded into the national accounts database using ERETES. They are used to elaborate the supply and use balances of products and the production accounts by industry. These data are made consistent with other data sources which give information on the import and export of products, the output of the formal sector, the final consumption of households and public administration, the gross fixed capital formation, the change in inventories.

5. Compiling SUT's challenges and general recommendations

A. Compiling supply and use tables challenges

The elaboration of SUTs is a challenging and complex process. Producing such a complex tool is not an easy task even in countries which have well developed statistical systems. However, in many developing countries including Arab countries, the statistical system is fragile and under increasing pressure to set up comprehensive and reliable data sources. Consequently, the compilation of supply and use tables for these economies is an extremely laborious task requiring a large investment of human resources. This investment, although costly, is necessary to ensure the quality of the national accounts estimates. Furthermore, with every succeeding year, the act of compiling the SUT will become easier, the possibilities for refinement greater and the analysis more useful.

Generally, the major problems faced by statistical offices in the Arab region, in the process of compiling supply and use tables are essentially due to the lack of reliable and detailed data, staff shortage, lack of technical expertise and financial constraints.

1. Lack of detailed data

The compilation of supply and use tables requires a lot of data. Therefore, the most challenging issue in compiling SUTs is the lack of updated surveys on establishment to provide disaggregated data required for constructing matrices of production and intermediate consumption at detailed product level.

To overcome data gaps and unavailability of detailed breakdowns, we recommend:

- Using administrative sources for statistical purposes; as administrative data can be prepared relatively quickly, their costs are lower and can be released earlier than data collected through censuses and surveys.
- Organizing visits to the most important enterprises for collecting information about the structure of their output and input.
- Directly asking data suppliers and relevant parties (experts, professional unions…) about the input's structure of a given industry.
- Using technical coefficients from a neighbouring country as a starting point (borrowing structure from similar economies). These coefficients will be combined and applied to estimates of total intermediate demand by activity to give preliminary estimates of intermediate demand by product and will be analysed in the balancing process of the SUT.

2. Lack of human resources

In most Arab countries, national accounts departments are very small units, not exceeding ten people in the best case. In these conditions, the production of the supply and use tables will

be very challenging for such small teams. The shortage of staff for this very laborious and comprehensive work of SUTs becomes more and more pressing with the regular shifting of competent staff due to transfers or promotions.

To overcome the constraint of lack of personnel available for building supply and use tables, we suggest to:

- Set up a policy to resolve resource issues within National Accounts department aiming at addressing matters such as recruitment, retention and capability.
- Recruit appropriately skilled candidates increasing the number of economists and statisticians and developing the necessary skills.
- Use the available resources efficiently and effectively.
- Invest in improving the compilation techniques and the skills and knowledge of the compilers of SUTs.
- Research for an adequate external technical assistance.

3. Financial constraints

Some statistical offices in the Arab region, face the problem of lack of budgetary resources to conduct surveys on input-output necessary for building supply and use tables and to support all costs of compiling SUTs (the financial resources are not sufficient for acquiring adequate IT for supporting the tedious process of producing SUTs).

To meet the challenge of financial constraints, it is highly recommended to:

- Communicate efficiently about the importance of SUTs to raise the awareness of the usefulness of SUTs and their importance in producing coherent and comprehensive statistics for the policy makers and thus to mobilise the funds necessary for their success.
- Request the financial assistance of international organisations to carry out the statistical operations and the implementation of the IT services necessary for the success of a project of building the supply and use table.

B. General recommendations

The supply and use tables are important statistical tools in national accounts, as they allow making the best use of all available data. They also have the potential to identify gaps, inconsistencies and evaluation issues in the data system and thus to improve the accuracy of the national accounts source data. Moreover, SUTs ensure the exhaustiveness of GDP estimates through the balancing process which results in a single, reconciled estimate of GDP.

To carry out a project of building supply and use tables and take advantage of producing such a complex system, it is recommended to:

- Set up a detailed work schedule in which the timing of each step (collect and data processing, balancing SUT, dissemination) is specified and well known by the suppliers of the basic data used for SUTs compilation as well as by the users. Thus, the data providers will release it in the timely deadlines which will not jeopardize providing SUTs to users in timely manner. Thereby, no attention will be paid to any data release from stakeholders and which may delay the SUTs' timeline.

- Strengthen the collaboration between statistical office and related line ministries for sharing and making use of data.
- Enhance relationships with data sources used as inputs for the supply and use tables.
- Set an optimal balance between the efforts of processing and the relative importance of the outputs.
- Decide on the number of rows and columns of the SUTs according to the availability of detailed data sources and the size of staff involved in producing these tables.
- Organize the work of all the staff involved in the process by using an appropriate IT tool for managing the data base and processing SUTs. The IT tool should preserve initial data and document all changes made by each accountant on the row data.
- Use manual methods of balancing in order to reach convergence between the rows and columns of the tables and do not use automatic procedure until remaining discrepancies are so small (less than 5 per cent).

Take advantage of foreign technical assistance without forgetting that local staff have an understanding of the characteristics of the local economy that visiting advisors can never compete with.

- Pay particular attention to documenting production processes in very comprehensive methodological notes. This systematic documentation is a fundamental component of the process of monitoring the quality of SUTs and improving the methodology used in their population: it requires a rigorous and transparent description of the production process, and makes knowledge transmission easier when staff may move to other department.
  In addition, users of supply and use tables should have knowledge of the way these tables are compiled and have to be aware of the assumptions made in this process.
- Produce SUTs every five years when compiling national accounts of the benchmark year because statistical offices cannot handle the burden of producing SUTs annually.

6. Conclusion

The main purpose of National Accounts is to offer an exhaustive description of an economy. This means that the main aim of compiling statistics is to cover as much as possible the productive activities that belong to production boundary.

Generally, efforts to achieving GDP exhaustiveness should start with the data collection process, which include planning the surveys, questions to be included in the surveys, scrutiny of administrative data, and steps needed to collect information from missing areas.

Despite the continuously national accountant efforts to integrate various and numerous data sources to be exhaustive, there are data that can never be expected to cover all the production falling within the 2008 SNA boundary. Some of those productive activities have to be indirectly measured using proxy information, including employment data, tax audit and economic models which are used to estimate production in respect of missing elements, such as for non-response, informal sector, underground production and illegal activities, so as to ensure that all productive activities undertaken in the economy are accounted for.

Ensuring that the GDP estimates are reliable and exhaustive is a high priority for all statistical offices. To achieve this goal, it is strongly recommended that the supply and use tables be introduced as an integrated part of national accounts production. They are building blocks for national accounts as they are used to ensure GDP is balanced for all three approaches (production, expenditure and income). The supply and use tables are a powerful tool to compare data from different sources and improve the coherence of the national accounts. They enable analyses of products and industries and allow productivity to be compiled at various levels of disaggregation. The supply and use tables allow economists and others to examine the internal workings of the economy, in particular detailing the contribution of specific industries and products to GDP. These statistics measure and analyse the production of products by industry, detailing the flows of products purchased by each industry, the distribution of sales for each product, and the incomes earned as an integral part of the compilation of GDP.

Some statistical offices tried to construct supply and use tables as an extension to regular national accounts production. Consequently, there was hardly any feedback between the two systems. In fact, compilation of supply and use tables after the compilation of production approach does not allow an independent estimation of supply and use tables because the figures should remain in line with published results. Furthermore, there is no way to assess the reliability and consistency of the initial estimation of GDP through a possible process of data confrontation and reconciliation.

Annex 1. Example to illustrate valuation methods in the circulation of goods

The following examples showed the circulation of goods from the producer to the final consumer:

(a) Table A1 covers the case when the wholesaler is not separately invoiced for the cost of transporting the goods from the producer;
(b) Table B1 shows the case when the wholesaler has to pay separately for the cost of delivery.

In the example given in tables A1 and B1, the purchaser's value paid by the consumer is 121 for his purchase of rice. In national accounting, the consumer is treated as though he consumed a package of products: rice, trade and transport margins, and taxes on products. The reason for doing this is that for the purpose of comparison over time and across consumers, eliminating the influence of government tax policy and distribution costs (consisting of both trade and transport margins), goods and services must be measured in such a way that the value reflects the quantity of goods produced and consumed.

The commodity flow tables for the examples A and B are respectively shown in tables A2 and B2.

In the first example, reflected in tables A1 and A2, the contract between the producer and the wholesaler is the delivery of rice at the wholesaler's gate, with a higher basic value of the delivered rice of 100 in A1 as the transport is not separately invoiced to the wholesaler. In A2, the transport is separately invoiced to the wholesaler, the trade margin produced in this case is 11 and the transport cost is treated as a wholesaler's IC. The transport output is needed to move the goods only from the wholesaler to the retailer and it is treated as retailer's IC. Thus, trade margin 8 is produced. Here, it is assumed that the producer must increase its intermediate inputs to bring the goods to the gate of the wholesaler.

Table A1. Example: Circulation from a producer of rice to a consumer (Transport not separately invoiced)

Producer	Wholesaler	Retailer	Consumer (household)
Sold to wholesale" (transport is included but not separately invoiced): 100 Sale tax: 2 (non-deductible)	Goods purchased for resale Cost: 102 (100 + 2) Sold to the retailer: 110 Sale tax: 2	Goods purchased for resale Cost: 112 Sold to the consumer: 120 Sale tax: 1	Purchaser's price: 121 Rice: 100 Transport margin: 0 Sale tax: 5 Trade margin: 16

Producer	Wholesaler	Retailer	Consumer (household)
	Transport charge extra (separately invoiced to the retailer): 3		
Output: Good (rice): 100	Output: Trade margin: 8 = 110 – 102 Transport: 3	Output: Trade margin: 8 = 120 – 112 IC on transport services = 3	Purchaser's price: 121

Table A2. The commodity flow tables for the example A1

Product	Basic price	Taxes on products	Transport margins	Trade margins	Supply in purchaser's price	Uses in purchaser's price
Rice	100	2 + 2 + 1 = 5	0	8 + 8 = 16	100 + 5 + 16 = 121	121
Transport services	3		0		0	3 (Retailer's IC)
Trade services	16			-16	0	0

Table B1. Example: Circulation from a producer of rice to a consumer (Transport separately invoiced)

Producer	Wholesaler	Retailer	Consumer (household)
Sold to wholesaler (transport separately invoiced) Basic price: 97 Transport margin: 3 Sale tax: 2	Goods purchased for resale Cost: 99 (97 + 2) Sold to the retailer: 110 Sale tax: 2 Transport charge extra (separately invoiced to the retailer): 3	Goods purchased for resale Cost: 112 Sold to the consumer: 120 Sale tax: 1	Purchaser's price: 121 Rice: 97 Sale tax: 5 Trade margin: 19
Output: Good (rice): 97 Transport: 3	Output: Trade margin: 11 = 110 – 99 Transport: 3 Wholesaler's IC on transport services = 3	Output: Trade margin: 8 = 120 – 112 Retailer's IC on transport services = 3	Purchaser's price: 97 + 5 + 19 = 121

Table B2. The commodity flow tables for the example B1

Product	Basic price	Taxes on products	Transport margins	Trade margins	Supply in purchaser's price	Uses in purchaser's price
Rice	97	2 + 2 + 1 = 5	0	8 + 11 = 19	97 + 5 + 19 = 121	121
Transport services	6		0		0	Wholesaler's and retailer's IC: 6
Trade services	19			-19	0	0

Example C1: Circulation from a producer of rice to a consumer (transport separately invoiced to the consumer)

Table C1. Households have to pay for service of transporting rice from the retailer to their houses. In this case, the cost of transporting is not a transport margin but a household's final consumption on transport services

Producer	Wholesaler	Retailer	Consumer (household)
Sold to wholesaler (transport is included but not separately invoiced): 100 Sale tax: 2	Goods purchased for resale Cost: 102 Sold to the retailer: 110 Sale tax: 2 Transport charge extra (separately invoiced to the retailer): 3	Purchaser's price/replacement cost: 112 Sold to the consumer: 120 Sale tax: 1 Transport charge invoiced separately to consumer: 3	Purchaser's price (rice): 121 Rice: 100 Sale tax: 15 Trade margin: 16 Transport margin: 3
Output: Good (rice): 100	Output: Trade margin: 8 = 110 – 102 Transport: 3 → retailer's IC	Output: Trade margin: 8 = 120 – 112 Transport: 3	Purchaser's price: 124

Table C2. The commodity flow tables for the example C1

Product	Basic price	Taxes on products	Transport margins	Trade margins	Supply in purchaser's prices	Uses in purchaser's prices
Rice	100	2 + 2 + 1 = 5	3	8 + 8 = 16	100 + 5 + 3 + 16 = 124	124
Transport services	6		-3		3	3 (Retailer's IC)
Trade services	16			-16	0	0

It should be noted that transportation costs for goods purchased for resale, if invoiced separately, are taken into account as intermediate consumption by wholesalers or retailers.

> Goods purchased for resale should be valued excluding any transport charges invoiced separately by the suppliers or paid to third parties by wholesalers or retailers: these transport services form part of the intermediate consumption of the wholesalers or retailers.[8]

Source: Vu, Quang Viet (2011). Compiling GDP by final expenditure, an operational guide using commodity flow approach.

8. SNA 2008, para. 6.148, c.

Annex 2. Consumption of fixed capital of general government sector in Moroccan national accounts

The general government sector consists of:

- All units of central, state or local government.
- All social security funds at each level of government.
- All non-market NPI that are controlled and mainly financed by government units.

The output of the general government sector is estimated through the costs of production namely:

- Intermediate consumption.
- Compensation of employees.
- Consumption of fixed capital.

To estimate the output of general government sector, which is calculated through total cost of production, it is necessary to estimate the consumption of its fixed capital as it is part of the cost. Estimating output is considered as the first step toward estimating its final consumption expenditure.

Consumption of fixed capital (K.1) is the decline during an accounting in the current value of the assets used by the sector. However, the amount of capital resources used up in the process of production in any period is not an identifiable set of transactions but just an imputed transaction which can only be measured by a system of conventions.

In Moroccan national accounts, the calculation of the CCF of the Public Administrations is prepared in basis of categories of products which are defined according to their probable lifetime namely:

- Building.
- Civil engineering works.
- Transportation equipment.
- Computer hardware.
- Furniture and office equipment.
- Other materials.

Each asset has a fixed life equal to the duration of its use; it is the probable lifetime determined from the results of the 'investment of government sector survey' by types of assets and sub-sectors:

Probable lifetime

Type of asset	State	Non-market NPI	Local authorities
Constructions	50	56	45
Transport equipment	13	13	14
Computer hardware	7	8	7
Furniture and office equipment	19	18	20
Other equipment	19	24	15
Other assets	29	21	37

- The existing fixed capital is valued at its replacement cost in the year under review.
- The economic depreciation applied is linear (distribution of the value to be amortised equally over the entire life of the asset).

The calculation of the fixed capital consumption of the general government is based on the first estimation for the year 1998 (A98), derived from the data from the "investment of government sector survey" carried out by the High Commission for Planning (HCP).

For the years following 1998, the relation applied for each category of asset is:

Where the parameters of this relationship are:

A: consumption of fixed capital
d: lifetime of the category of the property under consideration
t: year for which consumption of fixed capital is calculated
P: price index of the category of the property under consideration
I: GFCF

Annex 3. Moroccan national accounts classification of industry

Product ID	Level	Industry
A00	1	Agriculture, hunting and forestry
A00001	2	Crops, horticulture and related services
A00002	2	Livestock, hunting and related services
A00003	2	Forestry, logging and related services
B05	1	Fishing, aquaculture
B05000	2	Fishing, aquaculture
C01	1	Mining and extraction of coal, lignite and peat
C01000	2	Extraction of coal, lignite and peat
C02	1	Extraction of metal ore minerals
C02000	2	Extraction of metal ore minerals
C03	1	Extraction of other types of ore minerals
C03001	2	Extraction of natural phosphate
C03002	2	Other extractions of non-metallic minerals
D15	1	Manufacture of food products and beverages
D15001	2	Production, processing and preservation of meat and meat products
D15002	2	Processing and preservation of fish and fish products
D15003	2	Processing and preservation of fruit and vegetables
D15004	2	Manufacture of vegetable and animal oils and fats
D15005	2	Manufacture of dairy products
D15006	2	Manufacture of cereals and starches
D15007	2	Manufacture of baking products
D15081	2	Manufacture of sugar
D15082	2	Manufacture of other food products industry
D15009	2	Manufacture of beverages

Product ID	Level	Industry
D16	1	Manufacture of tobacco products
D16000	2	Manufacture of tobacco products
D17	1	Manufacture of textiles
D17001	2	Spinning
D17002	2	Weaving
D17003	2	Textile finishing
D17004	2	Manufacture of textile items
D17051	2	Manufacture of carpets and rugs
D17052	2	Manufacture of other textile items
D17006	2	Manufacture of knitted fabrics and other items
D18	1	Manufacture of wearing apparel; dressing and dyeing of fur
D18000	2	Manufacture of wearing apparel; dressing and dyeing of fur
D19	1	Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear
D19001	2	Primer and tanning of leather
D19002	2	Manufacture of luggage, handbags, saddlery, harness and footwear
D20	1	Manufacture of wood and wooden products
D20000	2	Manufacture of wood and wooden products
D21	1	Manufacture of paper and paper products
D21001	2	Manufacture of pulp, paper and cardboard
D21002	2	Manufacture of paper or cardboard items
D22	1	Publishing, printing and reproduction of recorded media
D22000	2	Publishing, printing and reproduction of recorded media
D23	1	Refining oil and other energy products
D23000	2	Refining oil and other energy products
D24	1	Manufacture of chemicals and chemical products
D24001	2	Basic chemical industry
D24002	2	Agrochemical manufacturing
D24003	2	Manufacture of paints, varnishes and related products
D24004	2	Pharmaceutical industry

Product ID	Level	Industry
D24005	2	Manufacture of soaps, perfumes and cleaning products
D24006	2	Other chemical industries
D25	1	Manufacture of rubber and plastics products
D25000	2	Manufacture of rubber and plastics products
D26	1	Manufacture of other non-metallic mineral products
D26001	2	Manufacture of glass and glass products
D26002	2	Manufacture of ceramic products and tiles
D26003	2	Manufacture of terracotta tiles and bricks
D26004	2	Manufacture of cement, lime and plaster
D26005	2	Manufacture of articles of cement, concrete or plaster
D26006	2	Cutting, shaping and finishing of stone
D26007	2	Miscellaneous mineral product manufacturing
D27	1	Manufacture of basic metals
D27000	2	Manufacture of basic metals
D28	1	Manufacture of fabricated metal products, except machinery and equipment
D28000	2	Manufacture of fabricated metal products, except machinery and equipment
D29	1	Manufacture of machinery and equipment
D29000	2	Manufacture of machinery and equipment
D30	1	Manufacture of office, accounting and computing equipment
D30000	2	Manufacture of office, accounting and computing equipment
D31	1	Manufacture of electrical machines and apparatus
D31001	2	Manufacture of electrical equipment
D31002	2	Manufacture of insulated wire and cable
D31003	2	Manufacture of accumulators and electric cells
D32	1	Manufacture of radio, television and communication equipment
D32000	2	Manufacture of radio, television and communication equipment
D33	1	Manufacture of medical, precision and optical instruments, watches and clocks
D33000	2	Manufacture of medical, precision and optical instruments, watches and clocks
D34	1	Manufacture of motor vehicles, trailers and semi-trailers
D34001	2	Manufacture of motor vehicles

Product ID	Level	Industry
D34002	2	Manufacture of bodies (coachwork) for motor vehicles; manufacture of trailers
D34003	2	Manufacture of parts and accessories for motor vehicles and their engines
D35	1	Manufacture of other transport equipment
D35001	2	Building of ships, manufacture of aircraft and spacecraft
D35002	2	Manufacture of motorcycles and bicycles
D36	1	Manufacture of furniture; n.e.c. industry
D36001	2	Manufacture of furniture
D36002	2	Jewellery
D36003	2	Other miscellaneous industries
D37	1	Recycling
D37000	2	Recycling
E00	1	Electricity, gas and water supply
E00001	2	Production, collection and distribution of electricity and gas
E00002	2	Collection, purification and distribution of water
F45	1	Construction
F45001	2	Buildings
F45002	2	Other constructions
F45003	2	Renting of construction or demolition equipment with operator
G00	1	Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods
G00001	2	Sale, maintenance and repair of motor vehicles
G00002	2	Retail sale of automotive fuel
G00003	2	Wholesale trade
G00004	2	Retail trade and repair of household goods
H55	1	Hotels and restaurants
H55000	2	Hotels and restaurants
I01	1	Transport
I01001	2	Transport via railways
I01002	2	Other land transport
I01003	2	Sea and coastal water transport

Product ID	Level	Industry
I01004	2	Air transport
I01005	2	Supporting and auxiliary transport services
I02	1	Post and telecommunications
I02001	2	Post and courier services
I02002	2	Telecommunications
J00	1	Financial services and insurance
J00001	2	Financial intermediation
J00002	2	Insurance
J00003	2	Financial intermediation services
K00	1	Real estate, renting and business services
K00001	2	Real estate activities
K00002	2	Renting of machinery and equipment without operator
K00003	2	Computer and related services
K00004	2	Services provided primarily to businesses
L75	1	Public administration and defence; compulsory social security
L75001	2	General public administration
L75002	2	Compulsory social security
MN0	1	Education, health and social work services
MN0801	2	Non-market education
MN0802	2	Market education
MN0803	2	Non-market health and non-market social work services
MN0804	2	Market health
OP0	1	Other non-financial services
OP0001	2	Sewage and refuse disposal, sanitation and similar activities
OP0002	2	Public organizations services
OP0003	2	Recreational activities
OP0004	2	Personal services
OP0005	2	Households services
TR0	1	Territorial correction
TR0000	2	Territorial correction

Annex 4. Moroccan national accounts classification of products

Product ID	Level	Product
A00	1	Agriculture, hunting and forestry
A00001	2	Crops, horticulture and related services
A00001101	3	Durum wheat
A00001102	3	Soft wheat
A00001103	3	Barley
A00001104	3	Maize
A00001105	3	Rice
A00001109	3	Other cereals
A00001201	3	Beans
A00001202	3	Peas
A00001209	3	Other vegetables n.e.c.
A00001300	3	Forage crops
A00001401	3	Sugar crops
A00001402	3	Non-tropical oilseeds
A00001403	3	Other products from the oilseed crop
A00001409	3	Other food industry crops
A00001501	3	Cotton
A00001502	3	Other textile plants
A00001503	3	Tobacco crops
A00001509	3	Other industrial crops
A00001600	3	Fresh vegetables
A00001700	3	Floral, ornamental, aromatic and medicinal plants
A00001801	3	Olives
A00001802	3	Citrus

Product ID	Level	Product
A00001803	3	Dates
A00001804	3	Grapes
A00001809	3	Other arboriculture products
A00001900	3	Additional services
A00002	2	Livestock, hunting and related services
A00002001	3	Livestock
A00002002	3	Other livestock, except poultry
A00002003	3	Live poultry
A00002004	3	Milk and derivatives
A00002005	3	Eggs
A00002006	3	Honey
A00002007	3	Wool and fur
A00002009	3	Other products (including related services)
A00003	2	Forestry, logging and related services
A00003001	3	Industrial wood
A00003002	3	Softwood lumber
A00003003	3	Firewood
A00003004	3	Natural cork
A00003009	3	Other (including related services)
B05	1	Fishing, aquaculture
B05000	2	Fishing, aquaculture
B05000001	3	Sardines
B05000009	3	Other products (including related services)
C01	1	Mining of coal and lignite; extraction of peat
C01000	2	Extraction of coal, lignite, peat
C01000100	3	Coal, lignite and peat
C01000201	3	Crude oil
C01000202	3	Natural gas
C01000209	3	Other (including related services)
C02	1	Extraction of metal ore minerals

Product ID	Level	Product
C02000	2	Extraction of metal ore minerals
C02000001	3	Iron ore
C02000002	3	Lead, zinc and tin ore
C02000003	3	Copper ores
C02000009	3	Other metal ore minerals
C03	1	Other extractions of ore minerals
C03001	2	Natural phosphate extraction
C03001000	3	Natural phosphate
C03002	2	Other extractions of non-metallic minerals
C03002001	3	Stones, sands
C03002002	3	Salt
C03002009	3	Minerals n.e.c.
D15	1	Manufacture of food products and beverages
D15001	2	Production, processing and preservation of meat and meat products
D15001001	3	Red meats
D15001002	3	White meats
D15001003	3	Prepared and processed meats
D15001009	3	Other meats
D15002	2	Processing and preservation of fish and fish products
D15002001	3	Frozen fish
D15002009	3	Canned fish and others
D15003	2	Processing and preservation of fruits and vegetables
D15003001	3	Citrus products
D15003002	3	Tomato products
D15003003	3	Canned olives
D15003004	3	Other fruit and vegetable juices
D15003009	3	Products from other prepared and preserved fruits and vegetables
D15004	2	Manufacture of vegetable and animal oils and fats
D15004001	3	Olive oil
D15004002	3	Refined olive oil

Product ID	Level	Product
D15004003	3	Oils of raw seeds
D15004004	3	Refined seed oils
D15004009	3	Other products of the fat industry
D15005	2	Manufacture of dairy products
D15005001	3	Liquid milk
D15005002	3	Other types of milk
D15005009	3	Ice cream and other dairy products
D15006	2	Manufacture of cereals and starches
D15006001	3	Durum wheat flour
D15006002	3	Soft wheat flour
D15006003	3	Flour of other cereals
D15006004	3	Semolina (except vegetable semolina)
D15006005	3	Husked and transferred rice
D15006009	3	Other products
D15007	2	Manufacture of baking products
D15007001	3	Fresh bread
D15007002	3	Pasta and couscous
D15007003	3	Biscuit products
D15007009	3	Other
D15081	2	Manufacture of sugar
D15081001	3	Raw sugar
D15081002	3	Refined or conditioned sugar
D15081003	3	Other types of sugar
D15081009	3	Molasses, pulp and other residues
D15082	2	Manufacture of other products from the food industry
D15082001	3	Coffee and related products
D15082002	3	Tea and related products
D15082003	3	Yeast
D15082004	3	Confectionery and chocolate products
D15082009	3	Other food products

Product ID	Level	Product
D15009	2	Manufacture of beverages
D15009101	3	Beer
D15009109	3	Other alcoholic beverages
D15009201	3	Mineral waters (drinking water)
D15009202	3	Various non-alcoholic drinks
D16	1	Manufacture of tobacco products
D16000	2	Manufacture of tobacco products
D16000000	3	Tobacco
D17	1	Manufacture of textiles
D17001	2	Spinning
D17001000	3	Textile yarn
D17002	2	Weaving
D17002000	3	Fabrics
D17003	2	Textile finishing
D17003000	3	Textile finishing
D17004	2	Manufacture of textile items
D17004001	3	Blankets
D17004002	3	Linen
D17004003	3	Other items made out of textile
D17051	2	Manufacture of carpets and rugs
D17051000	3	Rugs and carpets
D17052	2	Manufacture of other textile items
D17052001	3	Twine, nets and ropes
D17052009	3	Other textile products
D17006	2	Manufacture of knitted fabrics and other items
D17006001	3	Knitted fabrics
D17006002	3	Other items
D18	1	Manufacture of wearing apparel and fur
D18000	2	Manufacture of wearing apparel and fur
D18000001	3	Leather and fur

Product ID	Level	Product
D18000002	3	Outerwear
D18000003	3	Underwear
D18000009	3	Other clothing items
D19	1	Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear
D19001	2	Primer and tanning of leather
D19001000	3	Tanned leather
D19002	2	Manufacture of luggage, handbags, saddlery, harness and footwear
D19002001	3	Travel and leather goods
D19002002	3	Shoes
D20	1	Manufacture of wood and wooden products
D20000	2	Manufacture of wood and wooden products
D20000001	3	Sawn, planed and impregnated wood
D20000002	3	Wood panels and similar items
D20000003	3	Carpentry and wooden carpentry
D20000004	3	Wooden packaging
D20000005	3	Cork or basketry
D20000006	3	Various wooden items
D21	1	Manufacture of paper and paper products
D21001	2	Manufacture of paper pulp, paper and cardboard
D21001001	3	Paper pulp
D21001002	3	Paper and cardboard
D21002	2	Manufacture of paper or cardboard items
D21002000	3	Paper or cardboard items
D22	1	Publishing, printing and reproduction of recorded media
D22000	2	Publishing, printing and reproduction of recorded media
D22000001	3	Paper edition
D22000002	3	Sound editing
D22000003	3	Printing house
D22000004	3	Reproduction and registration products

Product ID	Level	Product
D23	1	Refining oil and other energy products
D23000	2	Refining oil and other energy products
D23000001	3	Gasoline
D23000002	3	Diesel
D23000003	3	Fuel oil
D23000004	3	Jet fuel
D23000005	3	Other petroleum products
D23000009	3	Other energy products, except electricity and water
D24	1	Manufacture of chemicals and chemical products
D24001	2	Basic chemical industry
D24001001	3	Industrial gas
D24001002	3	Nitrogen products and fertilizers
D24001003	3	Basic plastics and synthetic rubber
D24001004	3	Phosphoric acid
D24001009	3	Other basic chemicals
D24002	2	Agrochemical manufacturing
D24002000	3	Agrochemicals
D24003	2	Manufacture of paints, varnishes and related products
D24003000	3	Paints, varnishes and related products
D24004	2	Pharmaceutical industry
D24004000	3	Basic pharmaceutical products and pharmaceutical preparations
D24005	2	Manufacture of soaps, perfumes and cleaning products
D24005001	3	Soaps
D24005002	3	Detergents and cleaning products
D24005003	3	Perfumes and toiletries
D24006	2	Other chemical industries
D24006001	3	Artificial or synthetic fibres
D24006009	3	Other chemicals
D25	1	Manufacture of rubber and plastics products
D25000	2	Manufacture of rubber and plastics products

Product ID	Level	Product
D25000101	3	Pneumatic
D25000102	3	Other rubber products and articles
D25000201	3	Plates, sheets, tubes, profiles and packaging made of plastics
D25000202	3	Plastic construction elements
D25000203	3	Other plastic items
D26	1	Manufacture of other non-metallic mineral products
D26001	2	Manufacture of glass and glass products
D26001000	3	Glass and glassware
D26002	2	Manufacture of ceramic products and tiles
D26002001	3	Ceramic products
D26002002	3	Ceramic tiles
D26003	2	Manufacture of terracotta tiles and bricks
D26003000	3	Terracotta tiles and bricks
D26004	2	Manufacture of cement, lime and plaster
D26004000	3	Cement, lime and plaster
D26005	2	Manufacture of cement, concrete or plaster items
D26005000	3	Cement, concrete or plaster items
D26006	2	Cutting, shaping and finishing of stone
D26006000	3	Marble and worked stones
D26007	2	Miscellaneous mineral product manufacturing
D26007001	3	Abrasive products
D26007002	3	Non-metallic mineral products
D27	1	Manufacture of basic metals
D27000	2	Manufacture of basic metals
D27000001	3	Hot wires, cast iron or steel pipes and other products
D27000002	3	Converted steel products
D27000003	3	Precious metals
D27000004	3	Alumina, aluminium and half aluminium products
D27000005	3	Lead, zinc, tin, semi-finished products and copper
D27000006	3	Other non-ferrous metals

Product ID	Level	Product
D27000007	3	Casting parts
D28	1	Manufacture of fabricated metal products, except machinery and equipment
D28000	2	Manufacture of fabricated metal products, except machinery and equipment
D28000001	3	Metal elements for construction
D28000002	3	Carpentry and metal closures
D28000003	3	Metal tanks and boilers for central heating
D28000004	3	Boiler products
D28000005	3	Forged, processed and coated metal parts
D28000009	3	Other metal items
D29	1	Manufacture of machinery and equipment
D29000	2	Manufacture of machinery and equipment
D29000101	3	Motors and turbines
D29000102	3	Pumps, compressors and hydraulic systems
D29000103	3	Valves
D29000104	3	Gears and mechanical transmission parts
D29000200	3	General purpose machines
D29000300	3	Agricultural machinery and equipment
D29000400	3	Machine tools
D29000500	3	Other special purpose machines
D29000600	3	Weapons and ammunition
D29000701	3	Appliances
D29000702	3	Other non-electric household appliances
D30	1	Manufacture of office, accounting and computing equipment
D30000	2	Manufacture of office, accounting and computing equipment
D30000001	3	Office equipment
D30000002	3	Hardware
D31	1	Manufacture of electrical machines and apparatus
D31001	2	Manufacture of electrical machines
D31001001	3	Electric motors, generators and transformers
D31001002	3	Distribution and electrical control equipment

Product ID	Level	Product
D31002	2	Manufacture of insulated wires and cables
D31002000	3	Insulated wires and cables
D31003	2	Manufacture of accumulators, electric cells
D31003001	3	Accumulators and batteries
D31003002	3	Lamps and light fixtures
D31003003	3	Other electrical equipment
D32	1	Manufacture of radio, television and communication equipment
D32000	2	Manufacture of radio, television and communication equipment
D32000001	3	Electronic components
D32000002	3	Transmitting and transmission apparatus
D32000003	3	Reception, recording or reproduction apparatus for sound and picture
D33	1	Manufacture of medical, precision and optical instruments, watches and clocks
D33000	2	Manufacture of medical, precision and optical instruments, watches and clocks
D33000001	3	Medico-surgical and orthopaedic equipment
D33000002	3	Measuring and control instruments and equipment
D33000003	3	Optical and photographic material
D33000004	3	Watchmaking
D34	1	Manufacture of motor vehicles, trailers and semi-trailers
D34001	2	Manufacture of motor vehicles
D34001001	3	Specific cars
D34001002	3	Commercial vehicles
D34001009	3	Other vehicles
D34002	2	Manufacture of bodywork for motor vehicles; manufacture of trailers
D34002000	3	Bodywork and trailers
D34003	2	Manufacture of parts and accessories for motor vehicles and their engines
D34003000	3	Automotive equipment
D35	1	Manufacture of other transport equipment
D35001	2	Building of ships, manufacture of aircraft and spacecraft
D35001001	3	Naval transport equipment

Product ID	Level	Product
D35001002	3	Railway transport equipment
D35001003	3	Aeronautic and space transport equipment
D35002	2	Manufacture of motorcycles and bicycles
D35002001	3	Motorcycles and bicycles
D35002002	3	Other transport equipment
D36	1	Manufacture of furniture; manufacturing n.e.c.
D36001	2	Manufacture of furniture
D36001001	3	Various furniture
D36001002	3	Mattresses and box springs
D36002	2	Jewellery
D36002000	3	Jewels and coins
D36003	2	Other miscellaneous industries
D36003001	3	Musical instruments
D36003002	3	Sports items
D36003009	3	Games, toys and other items
D37	1	Recycling
D37000	2	Recycling
D37000000	3	Recovery of recyclable metallic and non-metallic materials
E00	1	Electricity, gas and water supply
E00001	2	Production, collection and distribution of electricity and gas
E00001000	3	Electricity, gas and heat
E00002	2	Collection, purification and distribution of water
E00002000	3	Water
F45	1	Construction
F45001	2	Buildings
F45001001	3	Residential buildings
F45001002	3	Non-residential buildings
F45002	2	Other constructions
F45002001	3	Products of civil engineering works
F45002009	3	Other works

Product ID	Level	Product
F45003	2	Rental of construction or demolition equipment with operator
F45003000	3	Rental of construction equipment with operator
G00	1	Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods
G00001	2	Sale, maintenance and repair of motor vehicles
G00001001	3	Trade in vehicles and automotive equipment
G00001002	3	Maintenance and repair of motor vehicles
G00001003	3	Trade and repair of motorcycles
G00002	2	Retail sale of automotive fuel
G00002000	3	Retail trade of fuels
G00003	2	Wholesale Trade
G00003001	3	Wholesale of agricultural products
G00003009	3	Wholesale trade of other products (including intermediate services)
G00004	2	Retail trade and repair of household goods
G00004001	3	Retail business
G00004002	3	Repair of personal and household goods
H55	1	Hotels and restaurants
H55000	2	Hotels and restaurants
H55000001	3	Hotels and other short-term accommodation
H55000002	3	Restaurants and pubs
I01	1	Transport
I01001	2	Transport via railways
I01001001	3	Passenger transport
I01001002	3	Haulage
I01002	2	Other land transport
I01002001	3	Passenger transport
I01002002	3	Haulage
I01003	2	Sea and coastal water transport
I01003001	3	Passenger transport
I01003002	3	Haulage

Product ID	Level	Product
I01004	2	Air transport
I01004001	3	Passenger transport
I01004002	3	Haulage
I01005	2	Related transport services
I01005001	3	Travel agencies
I01005009	3	Other
I02	1	Post and telecommunications
I02001	2	Post and courier services
I02001000	3	Post
I02002	2	Telecommunications
I02002000	3	Telecommunications
J00	1	Financial activities and insurance
J00001	2	Financial intermediation
J00001000	3	Financial intermediation services
J00002	2	Insurance
J00002001	3	Life insurance and pension services
J00002002	3	Other insurance services
J00003	2	Services related to financial intermediation
J00003001	3	Related financial services
J00003002	3	Insurance services
K00	1	Real estate, renting and business activities
K00001	2	Real estate activities
K00001001	3	Real estate development
K00001002	3	Rent
K00001009	3	Other real estate activities
K00002	2	Renting of machinery and equipment without operator
K00002000	3	Rental services without operator
K00003	2	Computer and related services
K00003000	3	Computer business services
K00004	2	Services primarily provided to businesses

Product ID	Level	Product
K00004001	3	Research and development services
K00004002	3	Legal, accounting and management consulting services
K00004003	3	Architectural and engineering services
K00004004	3	Technical and other control services and analysis
L75	1	Public administration and defence; compulsory social security
L75001	2	General public administration
L75001001	3	Services related to the general skills of the administration
L75001002	3	Services related to the economic skills of the administration
L75001003	3	Services related to the social skills of the administration
L75001004	3	Sovereignty services
L75002	2	Compulsory social security
L75002000	3	Compulsory social security
MN0	1	Education, health and social work services
MN0801	2	Non-market education
MN0801000	3	Non-market educational services
MN0802	2	Market education
MN0802000	3	Market educational services
MN0803	2	Non-market health and non-market social work services
MN0803000	3	Non-market health services and social action
MN0804	2	Market health
MN0804001	3	Services for human health and market social action
MN0804002	3	Veterinary services
OP0	1	Other non-financial services
OP0001	2	Sewage and refuse disposal, sanitation and similar services
OP0001000	3	Sanitation, roads and waste management
OP0002	2	Public organizations services
OP0002001	3	Economic organizations
OP0002009	3	Other associations
OP0003	2	Recreational activities
OP0003001	3	Cinema, radio and television

Product ID	Level	Product
OP0003002	3	News agencies
OP0003009	3	Other recreational services
OP0004	2	Personal Services
OP0004000	3	Personal services
OP0005	2	Households Services
OP0005000	3	Domestic services
TR0	1	Territorial correction
TR0000	2	Territorial correction
TR0000000	3	Territorial Correction

Annex 5. Intermediate-level SNA/ISIC aggregation

A standard intermediate-level aggregation of 38 ISIC categories for internationally comparable SNA data reporting was agreed in the SNA updating process. These categories represent an aggregation level between the 21 ISIC sections and the 88 ISIC divisions.

A*38 code		Description	ISIC, Rev.4 code
1	A	Agriculture, forestry and fishing	01 to 03
2	B	Mining and quarrying	05 to 09
3	CA	Manufacture of food products, beverages and tobacco products	10 to 12
4	CB	Manufacture of textiles, wearing apparel, leather and related products	13 to 15
5	CC	Manufacture of wood and paper products; printing and reproduction of recorded media	16 to 18
6	CD	Manufacture of coke and refined petroleum products	19
7	CE	Manufacture of chemicals and chemical products	20
8	CF	Manufacture of basic pharmaceutical products and pharmaceutical preparations	21
9	CG	Manufacture of rubber and plastics products, and other non-metallic mineral products	22 + 23
10	CH	Manufacture of basic metals and fabricated metal products, except machinery and equipment	24 + 25
11	CI	Manufacture of computer, electronic and optical products	26
12	CJ	Manufacture of electrical equipment	27
13	CK	Manufacture of machinery and equipment n.e.c.	28
14	CL	Manufacture of transport equipment	29 + 30
15	CM	Other manufacturing; repair and installation of machinery and equipment	31 to 33
16	D	Electricity, gas, steam and air conditioning supply	35
17	E	Water supply; sewerage, waste management and remediation	36 to 39
18	F	Construction	41 to 43

A*38 code		Description	ISIC, Rev.4 code
19	G	Wholesale and retail trade; repair of motor vehicles and motorcycles	45 to 47
20	H	Transportation and storage	49 to 53
21	I	Accommodation and food service activities	55 + 56
22	JA	Publishing, audio-visual and broadcasting activities	58 to 60
23	JB	Telecommunications	61
24	JC	IT and other information services	62 + 63
25	K	Financial and insurance activities	64 to 66
26	L	Real estate activities[a]	68
27	MA	Legal, accounting, management, architecture, engineering, technical testing and analysis activities	69 to 71
28	MB	Scientific research and development	72
29	MC	Other professional, scientific and technical activities	73 to 75
30	N	Administrative and support service activities	77 to 82
31	O	Public administration and defence; compulsory social security	84
32	P	Education	85
33	QA	Human health activities	86
34	QB	Residential care and social work activities	87 + 88
35	R	Arts, entertainment and recreation	90 to 93
36	S	Other service activities	94 to 96
37	T[b]	Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use	97 + 98[b]
38	U[c]	Activities of extraterritorial organizations and bodies	99[c]

Source: United Nations (2008). International standard industrial classification of all economic activities (ISIC), Revision 4. New York.

Notes:

[a] Of which imputed rental services of owner-occupied dwellings.

[b] The services producing activities of households in division 98 are outside the SNA production boundary.

[c] The activities of these institutions are not included in the activities reported by the countries in which they are located.

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Supply and use tables (SUTs) are a powerful tool to compare data from different sources and improve the coherence of economic statistics, and the exhaustiveness and accuracy of the Gross Domestic Product (GDP) estimates in national accounts, through the balancing process which results in a single, reconciled estimate of GDP. They enable analyses of products and industries and allow productivity to be compiled at various levels of disaggregation to identify gaps, inconsistencies and evaluation issues in the data system and thus to improve the accuracy of the national accounts source data. SUTs also allow economists and other users to examine the internal workings of the economy, in particular detailing the contribution of specific industries and products to GDP. These statistics measure and analyse the production of products by industry, detailing the flows of products purchased by each industry, the distribution of sales for each product, and the incomes earned as an integral part of the compilation of GDP.

Most of ESCWA member countries are still lagging behind in constructing SUTs. The complexity of compiling data from various sources represents one of the main challenges to the countries in the region, and therefore this area is featured as a priority challenge to be tackled. Under the economic pillars of the United Nations Development Account on Statistics and Data, ESCWA's statistics sub-programme planned twinning of countries (Morocco and Palestine with Jordan and Qatar), and produced two studies on the Moroccan and Palestinian practical compilation of SUTs to share knowledge and learn from their experiences. This study provides an overview on the compilation of the SUTs and expands on the case of SUTs compilation in Morocco.

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