

**A Descriptive Study
The Concept of Gross Domestic Product**

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By

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The Concept of Gross Domestic Product*

Abstract

The paper attempts to give a brief history of gross domestic product (GDP) and explain the concept of GDP and other related concepts. Next, it proceeds to explain the significance of this concept and lists approaches of GDP calculation. It also discusses the Kingdom's GDP in terms of its sources and calculation approaches. Afterwards, it explains the difference between nominal and real GDP. It also discusses the difference between Gross National Product and GDP. This is followed by an explanation of the difference between GDP and net domestic product. Subsequently, it elaborates on the contribution of regulatory sectors to GDP in real and nominal terms. Finally, it reviews some of the production size determinants and some related problems.

Keywords: Gross Domestic Product (GDP), Gross National Product (GNP), Net Domestic Product (NDP), National Accounts.

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1- Introduction:

GDP, which measures total value of goods and services produced by a country, prevails a list of macroeconomic concepts since it is the most comprehensive criterion. GDP is considered a part of national accounts, which are an integral set of statistics that enable policy-makers to determine whether the economy is in a state of contraction or expansion. Moreover, it may also be used in evaluating economic activity and its efficiency, as well as in measuring the size of macro economy. The concept of GDP is often tainted by ambiguity and is intertwined with other related concepts. Therefore, this entails reviewing GDP to determine its components. In this context, the study also provides simplified explanatory examples, intended to directly explain such notions. The purpose of this study is to clarify the concept of gross domestic product rather than reviewing and analyzing figures. This is left to studies concerned with this subject.

2- An Overview of GDP

Daily transactions contain millions of deals/exchanges. For the purpose of counting and summarizing such transactions under their institutional units in accounts that reflect the nature of those economic transactions, we have to rely on national accounts to perform this task.

The idea of issuing a System of National Accounts (SNA), which has an international character, began in the 1940s when the Organization for European Economic Co-operation (OEEC) funded the National Accounts Research Unit at the University of Cambridge that has come out with the notion of

what is currently known as "System of National Accounts (SNA)." Following that, the Statistical Office at the United Nations issued the UN System of National Accounts in 1953.¹

Later on, in 1968, the system was developed with several amendments were made to this system. With the development of financial markets, sophistication of economic transactions and more attention to environmental considerations began to appear, where all committees of the United Nations started in the mid-eighties to hold meetings to develop the system. As a result of those meetings, the system was issued in its developed form in 1993.

Eventually, the latest version of this SNA manual was issued in 2008. This system is mainly ratified for two objectives: first, to facilitate handling of national accounts. Second, to make comparisons between countries logical and viable. However, we should take into account that the system cannot be applied uniformly. This is due to the difference in the structure and nature of the economic system from one country to another.

Regulatory Manuals Included in the System of National Accounts:

- Production Account (GDP components).
- Main Distribution Account of Income Accounts (income from production).
- Transfers Account (redistribution).
- Household Expenditure Account.
- Capital Account.
- Domestic Financial Transactions Account (money flow).

¹ For more information about the development of GDP, see :Vanoli, A. A History of National Accounting. 2005. IOS Press. Amsterdam.

- Change in Asset Values Account.
- Assets and Liabilities Account (Balance Sheet).
- Foreign Transactions Account (Balance of Payments).

The Most Prominent Changes from 1993 SNA Manual to 2008 SNA Manual:

- ❖ New registrations to pension systems.
- ❖ Incorporating capital services.
- ❖ Incorporating results of research and empirical development as fixed assets.
- ❖ Incorporating military weapons and their means of transportation as fixed assets.
- ❖ Developing a method for registering goods whose ownership is being changed.

The System Applied by the General Authority for Statistics:

The General Authority for Statistics implements the System of National Accounts, issued in 1993, to production account, through which GDP is calculated. This occurred after the meeting of national accounts managers, on the occasion of the 14th meeting of Arab Gulf Cooperation Council, to discuss substitution of the new system for 1993 SNA. The report, issued by the United Nations Economic and Social Commission for Western Asia (UN-ESCWA) in June 2013, entitled: "Support for Implementation Strategy for 1993 SNA in the Arab Region", indicated that only 50 percent of the Arab countries have implemented the first phase of the system. This phase is represented by the compilation and dissemination of current accounts and capital account. 25% of such countries are considered in the pilot phase and 25% still adopting the system issued in 1968.

² For more information about the two systems. See: Sharjabi, Hamid, "Comparing Updates and Changes between 1993 and 2008 System of National Accounts", Khwarizmi Conference, Qatar.

The Significance of GDP

- ❖ GDP summarizes economic activities carried out by a community during a certain period (often a year.)
- ❖ GDP summarizes returns earned by production factors as a result of their contribution to domestic production.
- ❖ GDP is considered an important economic indicator that can be used for economic analyses, making development plans and policies and identifying economy's current trends.
- ❖ The expenditure approach for calculating GDP helps in identifying consumption trends for key and targeted sectors.
- ❖ GDP time series are used to prepare important economic forecasts for decision makers.
- ❖ GDP per capita indicator can be used as an approximate measure of the living standard.
- ❖ GDP is used as an indicator to compare countries to measure the economic performance of a country.

❖ The Concept of Gross Domestic Product and Other Related Concepts

In the Output approach, GDP is defined as:

Total monetary values of finished goods and services produced within a domestic economy by production factors inside its geographic area during a certain period of time (usually a year.) Other terms for GDP in output approach are: added value GDP or real value GDP.

GDP in output approach can be explained in two ways: GDP by activity and GDP by regulatory sector.

GDP in income approach is defined as: gross incomes of the factors of production (labor, capital and land), existing within a geographical area, that has contributed to the production process (i.e. to GDP) during a certain period of time, usually a year. There are other terms for GDP in income approach:

Gross income from factors of production or the structure of GDP cost.

GDP in income approach can be explained in two methods: gross income of the factors of production by activity and structure of GDP cost.

GDP in expenditure approach is defined as:

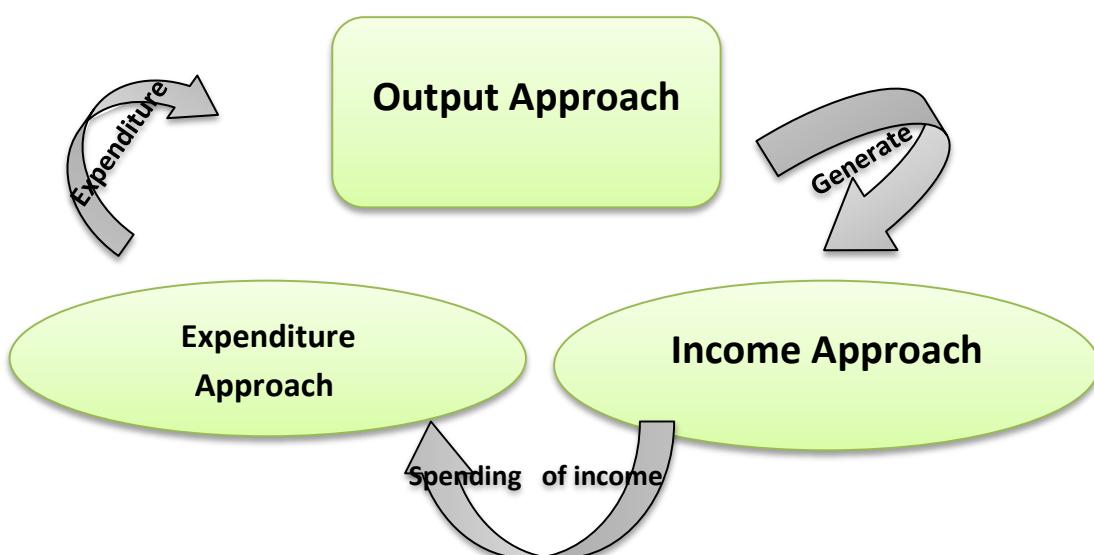
The gross value of goods directed to meet aggregate demand in a community (i.e. the sum of final expenditure). It includes private consumption expenditure, investment expenditure, government spending and net external transactions (exports minus imports) during a certain period of time (usually a year).

Other Terms of GDP in Expenditure Approach:

Expenditure on GDP or expenditure on GDP in buyers' values.

GDP in Expenditures Approach can be explained as follows:

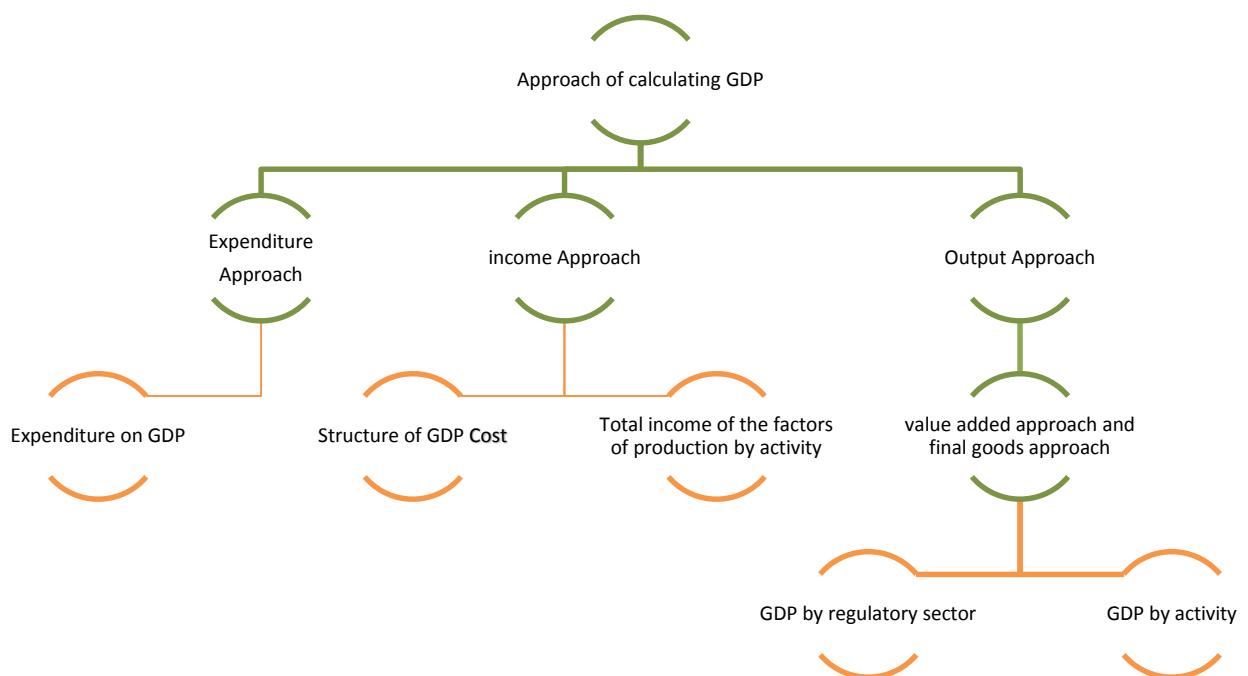
In one method; expenditure on GDP.



GDP in output approach = GDP in income approach = GDP in expenditure approach

This chart shows that GDP is obtained from production factors that receive most of income and then spend the gained income through expenditures. Therefore, we find that it is a circular flow chain, which means that the calculation result of the three concepts must be equal. Economists are accustomed to use the term "GDP" as a synonym for the above-mentioned notions since it is explanatory of the two other concepts. Thus, we will use the term "gross domestic product (GDP)" in the rest of the paper.

Approaches of Calculating GDP³



³ For more information about GDP Calculation Approaches, see :System of National Accounts, European Communities, International Monetary Fund, Organization for Economic Co-operation and Development, United Nations and World Bank, New York, 2009

There are three approaches used to calculate GDP: Output Approach, which uses two methods for estimation (1) added value and 2) final value), 3) Income Approach and Expenditure Approach. Although, those three approaches differ in how to estimate GDP, they will eventually yield the same exact result. Production estimation is to estimate the monetary values of what is being produced; income estimation is to estimate the income returns of producers; and expenditure estimation is to estimate the spending of income earnings by the factors of production.

Each calculation approach has certain items to be explained. Some approaches may include more than one method to explain. Output Approach is manifested in two ways; first, according to economic activity, second, according to regulatory sector. Income Approach also includes two methods, demonstrating its items; first: total income of the factors of production by activity, second, by the structure of GDP cost. Expenditure Approach includes one method, which is spending on GDP⁴ .

❖ **Output Approach**

1- Value Added Approach

In this approach, Saudi Arabia's GDP is calculated by the General Authority for Statistics through calculating increases added by each sector during the production process. Then, such additions in all economy sectors are summed to come up with the GDP. The added value is the difference between total production and cost of intermediate products during each stage of production.

⁴ It should be noted that the General Authority for Statistics provides GDP by Output Approach and Expenditure Approach in a separate location from income location. Both Approaches, first and second, are introduced under the National Accounts Branch of the Department of Economic Calculations, which enable dealing with these data. As for the income approach, it has not been presented with such indicators but has been published within an annual publication under the name of "National Accounts Bulletin for 2013," where it was mentioned in the middle of the publication.

Added value = gross production values - intermediate consumption + net taxes
 (taxes - subsidies)

Notes

- ❖ This approach differs from the finished goods approach since this approach may result in duplicated calculations that occur when calculating some goods whose production requires some intermediate goods. In finished goods approach, we calculate all in the final stage, but in this approach, we calculate the parts of that sum, which is accumulated throughout the stages of production. It is an important measure of productive activities because it measures each activity separately.

An Explanatory Example:

Assuming that a society produces one commodity, a thobe made of wool, where a shepherd sells the wool to a factory; and the factory spines and weaves it so as to be a new commodity (textile). The factory sells the textile to the tailor who tailors and knits it to form a new product (a thobe). The tailor, then, sells the final good to the final consumer.

Table 1

Production Stages	Seller	Buyer	Sale Value	Value Added
Wool	Shepherd	Fabric factory	15	15
Textile	Factory	Tailor	45	30
A thobe	Tailor	Consumer	70	25
Total Value Added				70

2-Finished Goods Value Approach⁵:

In this approach, the GDP is calculated by multiplying the quantity produced of each finished goods or services during a year by its price, and then summing the processes to come up with the GDP.

Notes

- ❖ This approach excludes intermediate goods and services (i.e. produced or purchased goods or services to be reused in the production process or for sale again) from production process and takes into account only finished goods and services. Goods or services are considered final products only if they were produced or purchased for final use, and not for reusing it in another production process.
- ❖ To avoid exaggerating calculation of production in this approach, the inventory of goods and services must be processed at the beginning and the end of the year because the inventory at the end of the year needs to be added to the value of final products, while the inventory of the beginning of the year is subtracted from the final products value. This is because the inventory constituents had already appeared as part of the final output of the previous year.
- ❖ To avoid exaggerating calculation of production in this approach, the value of imports of goods and services must be deducted from the value of the final products since those imports are part of the final output of other countries.

An Explanatory Example:

Assuming that a society produces one good, which is a thobe, made of wool, and the tailor sells the final product to the final consumer.

⁵ Frequently, the added value of the goods is used in the output approach since it is easier to implement in practice, as well as it limits duplication of calculations that might occur in the final goods approach.

Table 2

Production Stages	Seller	Buyer	Sale Value
A thobe	Tailor	Consumer	70

The table shows that the thobe is the final product; and it has been sold to the final consumer for a value of 70 riyals. This value is counted in GDP calculation without any mention of the value-added in the intermediate stages.

❖ Income Approach ⁶

In this approach, GDP is calculated through the income received by the factor of production. Then, using this approach, we get the income earned by the factors of production.

GDP according to Income Approach =

Employees Compensations (wages and salaries of the labor factor) + Total operating surplus (operating surplus + depreciation of fixed capital + net taxes (indirect taxes-production subsidies))

Notes

- ❖ Factors of production must contribute to the production of GDP in order to be counted within the income calculation approach. Therefore, social security payments, as an example, are not included within the income approach.
- ❖ Transferring assets ownership, such as houses, are not included in the income calculation approach.

⁶ Income Approach is issued late compared to the Output Approach and Expenditure Approach, because the income approach is based on some data from the Government Final Budget.

- ❖ Incomes, which are earned and not distributed to their beneficiaries, such as unpaid profits, are counted in the income approach.

An Explanatory Example:

Table 3

GDP calculated using Income Approach	Value
Salaries	3,000
Education allowance	500
House allowance	500
Operating Surplus	500
Indirect taxes	400
Depreciation of fixed capital	350
Production subsidy	-100
Total	5,150

❖ - Expenditure Approach

In this approach, GDP is calculated by calculating the total final expenditure at buyers' prices earned by the production factor in exchange of its contribution to the GDP. The number of factors of production that has contributed to the production process is almost hundreds of thousands in a single economy. In simple words, we determine expenditure parts in accordance with the spending of each productive sector, where each certain type of these sectors makes certain spending, the total of which constitutes the GDP.

GDP Using Expenditure Approach =

Private final consumption expenditure + investment expenditure (gross fixed capital formation + changes in inventori) + Government final consumption expenditure + net external expenditure (exports-imports)

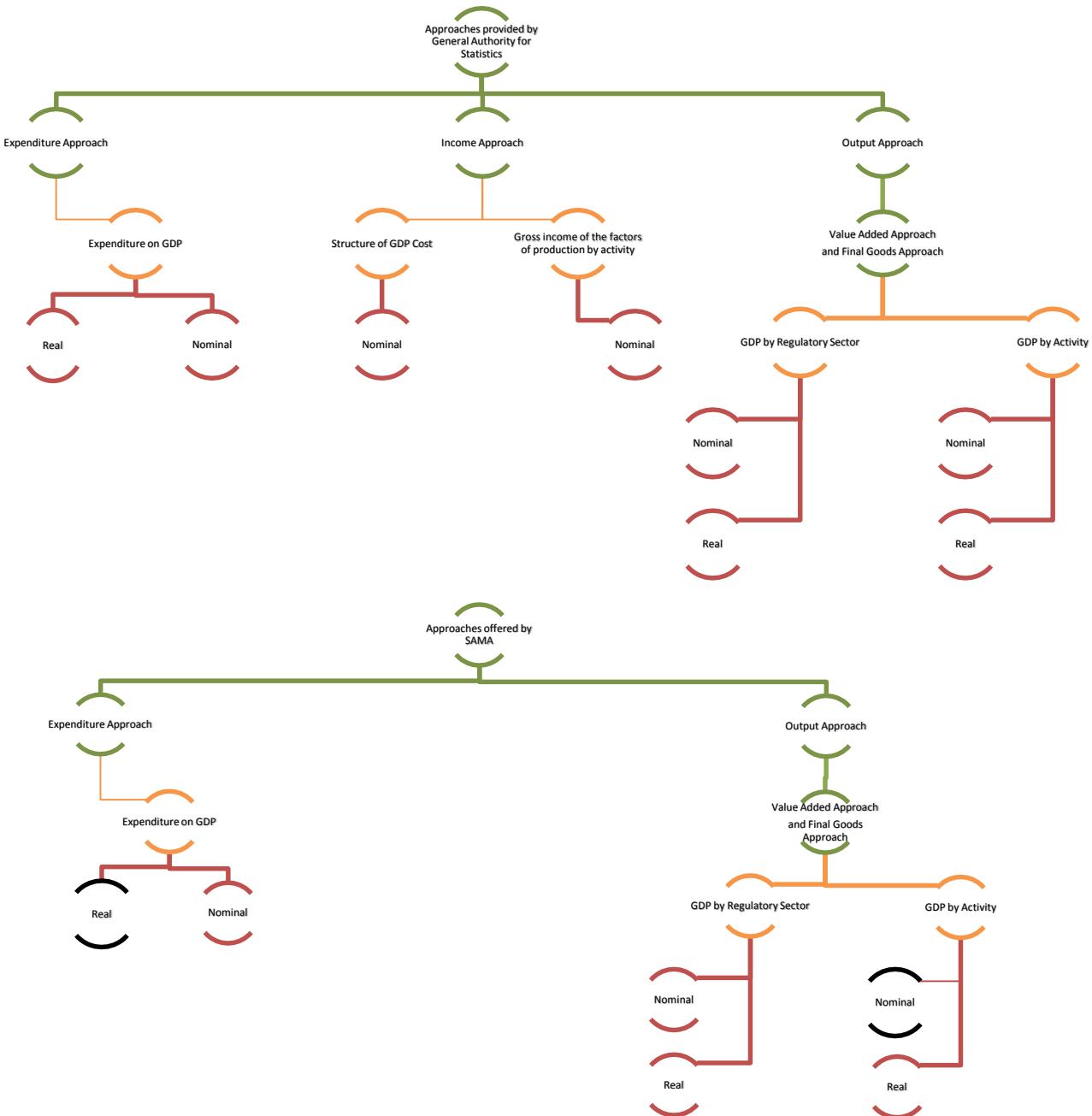
Notes

- ❖ Expenditure on imported goods and services is not included within the gross domestic product because it is calculated within the GDP of the exporting country.

Table 4

GDP Using Expenditure Approach	Value
Private final consumption expenditure	1,000
Government final consumption expenditure	6,400
Net external expenditure	500
Gross fixed capital formation	200
Changes in inventory	150
Total	8,250

- ❖ **Saudi Arabia's GDP:** statistics of the national accounts, which include GDP, are issued by the General Authority for Statistics since it is the official statistical reference for statistical data and information in the Kingdom. In addition, it is entrusted with several tasks and responsibilities that aim at providing accurate statistical data and information to be used in development plans.



It is the data source of national accounts upon which the Saudi Arabian Monetary Agency relies in its annual and quarterly publications and some other economic reports.

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❖ Output Approach

⁷ Black color in the "Approaches offered by SAMA" refers to that item presented only in the annual statistical bulletin.

The General Authority for Statistics uses two methods for calculating production. First, by economic activity; second, by regulatory sector.

Calculating Production By Economic Activity:⁸

Table 5

Nominal GDP by Economic Activity (Millions of Saudi Riyals)	2014*	Relative Contribution
Agriculture - forestry - Fisheries	53,625	1.9
Mining and quarrying	1,133,344	40.2
A- Crude oil and natural gas	1,122,803	39.8
B- Other mining and quarrying activities	10,541	0.4
Manufacturing Industries	303,860	10.8
A-Oil Refining	68,521	2.4
B-Other industries	235,339	8.3
Electricity, gas and water	32,758	1.2
Construction	152,367	5.4
Wholesale and retail trade, restaurants and hotels business	264,809	9.4
Transport, storage and communications	144,490	5.1
Finance, insurance, real estate and business services	292,541	10.4
A- House ownership	168,180	6.0
B-Others	124,361	4.4
Group, social and personal services	53,508	1.9
Calculated banking services	21,665	-0.8
Producers of government services	389,390	13.8
Import duties	22,696	0.8
GDP	2,821,722	100.0

⁸ Preliminary data, Source: General Authority for Statistics (Saudi Arabia)

Table (5) shows that nominal GDP by economic activity during 2014. Items are divided in accordance with economic activity, goods and services pertaining to each productive activity are added together, and all monetary values of all productive activities are added together. (Calculated banking services are, then, subtracted from GDP. GDP stood at 2,821,722 million.

❖ GDP by Regulatory Sectors:⁹

Table 6

Nominal GDP by regulatory sectors (Millions of Saudi Riyals)	2014*	Relative Contribution
Oil sector	1,198,255	42.5
Non-oil sector	1,600,772	56.7
private sector	1,137,298	40.3
Government sector	463,474	16.4
import duty	22,696	0.8
GDP	2,821,722	100.0

Table (6) shows that Nominal GDP by regulatory sectors in 2014, which includes a single item, consisted of a group of activities according to regulatory authority. We notice here that the nominal GDP by regulatory sector is equal to GDP by economic activity, which stood at 2,821,722 million riyals.

⁹ Preliminary data, Source: General Authority for Statistics (Saudi Arabia).

Definitions and Concepts Used

Agriculture, Forestry and Fisheries Include agricultural production, animal production, fishing, aquaculture, honey production and wood cutting.	Import Duty The customs duties that are imposed by the government on importers of goods and services.
Electricity, Gas and Water Include electricity, gas, steam, air conditioning, water storage, treatment and supply, as well as sewage activities, waste collection, recycling and disposal	Oil Sector Includes all public and private economic establishments whose main activities are oil and gas exploration, extraction or refining.
Non-Oil Sector Includes all public and private economic establishments whose main activities are not concentrated in the field of oil and gas. It consists of two items: a) Private sector includes all economic establishments owned by non-governmental entities. b) Public sector: includes all economic establishments that are owned by the government entirely or as majority holding and for which budgetary allocations are appropriated.	Government Services Producers Include all government departments, central and local administration units, defense, security, justice organs, units entrusted with planning of economic development, social welfare planning units, education, health, culture and social services that are provided free of charge or at a token price and social security organizations.
Wholesale and Retail, Hotels and Restaurants Business Wholesale and retail businesses include goods purchased to be sold as is. As for the hotels and restaurants, providing meals and accommodation is included.	Calculated Banking Services The amounts deposited in banks and lending institutions, and are re-lent again to other parties with interest. Therefore, this item is calculated as negative values subtracted from production because this process is an intermediary consumption.

Transport, Storage and Communications Land, water, air transport, transport by pipeline, storage, telegraph, mail and phone services, including publishing activities, film, television programs production, audio recordings activities, radio activities and information services activities	Finance, Insurance, Real Estate and Business Services Consist of two items: a) Home ownership: represented in real estate and includes estimating the rent value of housing units, whether paid (leased to others) or calculated (occupied by the owner). b) Others: represented in money services: including financial services activities. Insurance: includes insurance finance activities, re-insurance and pension funds. Business services: include activities auxiliary to the activities of financial services and insurance services.
Mining and Quarrying Consist of two items: a) crude oil and natural gas: crude oil and natural gas extraction. b) Mining and other quarrying activities: include coal, lignite and metal ores mining; quarrying activities; and mining support services activities.	Collective, Social and Personal Services Household services provided to families, including education, health, social work, care, activities, sport, entertainment and culture activities, as well as arts, shelters, libraries, museums and games activities.
Construction Includes all construction of residential and non-residential buildings: paving roads, constructing bridges, tunnels, railway, sewage and water projects, sanitation, electricity and	Manufacturing Industries Consist of two items: a) oil refining: includes chemicals, petroleum products and coal industry b) other industries: include food products, beverages, textiles, clothes

landlines projects, wells drilling, land, cultivation, installing air conditioning systems, linking buildings to sewerage and water network, installing sanitary ware, installing elevators, demolishing buildings and all civil engineering related activities	and leather, wood and cork, paper and paper products, printing and publishing, non-metallic ore mining products, core metal industries, machinery, rubber & plastics, pharmaceutical, basal metals products, formed metal products, electrical equipment, vehicles, furniture, machinery and equipment maintenance and installation.
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❖ Income Approach¹⁰

General Authority for Statistics suggests two methods; first, calculating the gross income based on factors of production by economic activity; second, by GDP cost structure.

Calculating Gross Income based on Factors of Production by Economic Activity:¹¹

Gross income based on factors of production by economic activity (Millions of Saudi Riyals)	2013		
	Total Domestic Income Factors	Staff Compensations	Gross Operating Surplus
Agriculture - forestry - Fisheries	51,636	5,607	46,029
Mining and quarrying	1,256,481	26,135	1,230,346
Crude oil and natural gas	1,246,557	25,058	1,221,499
Other mining and quarrying activities	9,925	1,077	8,848
Manufacturing Industries	283,261	44,042	239,219
Oil Refining	67,331	4,571	62,760

¹⁰ Data are available in the middle of the annual "National Accounts Bulletin for 2013". We would also like to note that the General Authority for Statistics did not mention the total GDP, but stopped at the producers of government services, so the researcher added and collected import duties to illustrate GDP value.

¹¹ Source: General Authority for Statistics.

Other industries	215,930	39,472	176,458
Electricity, gas and water	30,623	6,976	23,647
Construction	134,445	33,621	100,824
Wholesale and retail trade, restaurants and hotels business	241,586	45,513	196,073
Transport, storage and communications	135,357	20,297	115,060
Finance, insurance, real estate and business services	262,656	27,936	234,720
Collective, social and personal services	49,699	17,508	32,191
Calculated banking services	- 21191	0	- 21191
government services Producers	360,927	320,155	40,772
Import duties	21,205	0	21,205
Total	2,806,686	547,790	2,258,896
GDP	2,806,686		

Table (7) shows GDP in 2013, using the gross income of factors of production. Income of each activity is stated separately.

Cost structure of the GDP Method:¹²

Table 8

Cost structure of the GDP (Millions of Saudi Riyals)	2013
Staff Compensations	547,790
Gross Operating Surplus	2,258,896
Operating Surplus	2,005,370
Depreciation of fixed capital	229,998
Indirect taxes minus subsidies	23,528
GDP	2,806,686

¹² Source: General Authority for Statistics.

Table (8) shows gross domestic income in 2013, using structure of GDP cost method. It represents a summary of Table 7.

Definitions and Concepts Used

Total Domestic Income Factors Staff compensations added to gross operating surplus	Depreciation of Fixed Capital A decrease in the value of fixed assets used in the production during the accounting period due to their use.
Total Operating Surplus Includes Operating Surplus, the depreciation of fixed capital and net indirect taxes.	Operating Surplus Added values minus staff compensations, net indirect taxes and depreciation of fixed capital.
Staff Compensations Include all periodical money payable to employees in exchange for their work, whether in cash or in kind before deducting any deductions such as social insurance share.	Net Indirect Taxes (Indirect Taxes Minus Subsidies) : Taxes imposed on producers due to production, sale and purchase or use of goods and services. They include customs duties minus subsidy payable by the government, deducted from the current account of the private sector and the public sector, including subsidies paid to government projects to compensate for loss resulting from government policy to keep the price at a certain level.

❖ Expenditure Approach

General Authority for Statistics suggests one approach according to the entity that has made expenditure.

Using Expenditure Approach:¹³

Table 9

Expenditure on Nominal GDP (Millions of Saudi Riyals)	2014*
Government final consumption expenditure	741,590
Private final consumption expenditure	894,123
Inventory change	75,425
Gross fixed capital formation	677,251
Goods and services exports	1,363,323
Goods and services Imports	929,990
GDP	2,821,722

Table (9) shows the nominal gross domestic expenditure for 2014. Also, it should be indicated that GDP values, in both approaches, are equal to gross domestic expenditure.

Definitions and Concepts Used:

Private Final Consumption Expenditure Money spent by households on durable and non-durable goods and services, in addition money spent by private non-profit organizations that serve the household sector (which provides social services to families free of charge or at a token price that does not cover production costs, that are not mainly funded by the government).	Total Fixed Capital Formation Total values of fixed assets possessed by producers (productive assets used repeatedly in production processes for more than a year) during an accounting period, livestock raised for breeding and providing dairy products, and reforms made to non-productive assets such as land cultivation in addition to intangible assets used in the production (i.e. computer programs.)
Government Final Consumption Expenditure	Changes in Inventory

¹³ Preliminary data, Source: General Authority for Statistics.

The value of money spent by the government to produce self-consumed goods and services.	The market value of a change, occurring during an accounting period, in raw materials and products in process, finished products, livestock intended for slaughtering and goods purchased for resale.
Goods and Services Exports The value of goods and services whose ownership is transferred from residents to non-residents.	Imports of Goods and Services Value of goods and services whose ownership is transferred from non-residents to residents.

❖ Nominal GDP and Real GDP

Nominal GDP:

Gross monetary values at the current year prices of finished goods and services produced within the domestic economy by the factors of production in a geographic area during a certain period of time, usually a year. It is calculated by multiplying the quantities produced by current prices (i.e. by common market prices in the year the GDP is calculated).

Other Terms for Nominal GDP:

Monetary GDP, GDP at current prices.

Real GDP:

Gross monetary values at the base year prices of finished goods and services produced within the domestic economy by factors of production within a certain geographic area during a certain period of time, usually a year. It is calculated by multiplying the quantities produced by fixed prices (i.e. by fixed base year prices, which are relied upon for the following years.)

Other Terms for Real GDP:

GDP at fixed prices.

Real GDP =

$$\text{Implicit GDP Deflator for base year} \times \frac{\text{Nominal GDP for current year}}{\text{Implicit GDP Deflator for current year}}^{14}$$

GDP has already been defined as the gross monetary values of goods and services produced in an economy. To determine this monetary value, we use the measure of dominant current market prices during that year. Since prices are constantly changing due to price fluctuations, the nominal GDP will, in turn, change from year to another, even if production quantity is stable, as a result of a change in goods and services prices. So, nominal GDP is not preferred to be used to compare a country with another, or even to compare one year to another.

An Explanatory Example:

Suppose that the country (A) produces only one commodity (oil), (100 barrels of oil are produced per year during the first two years, which means that the quantity produced is fixed), and the price of a barrel in the first year is \$ 90 and increased to \$ 100 in the second year.

Please, calculate the nominal GDP for the two years and, then, explain if the economy grew?

Nominal GDP for year 1: quantity produced in the first year x price per barrel in the first year = \$ 9000

¹⁴ Deflators explains the change in GDP prices in the base year as compared to another year. It is an indicator provided by General Authority for Statistics and Information.

Nominal GDP for year 2: quantity produced in the second year x price per barrel in the second year = \$ 10,000

Although the quantity of oil produced has not changed in the two years, the nominal GDP yields different results due to changes in the prices without any real change in the quantities produced, which gives misleading results when comparing. Therefore, there is no real growth in production, but the growth is in prices.

For this reason, economists turn to use better measurement for monitoring the real economic activity, the so-called "real GDP", by adopting fixed prices and making it a base year when calculating the rest of the years, to avoid the impact of prices increase on GDP calculation.

For example,

In our previous example, suppose that the first year was adopted as a base year:

Real GDP for year 1: quantity produced for the first year x price per barrel in the base year = \$ 9000

Real GDP for year 2: quantity produced for the second year x price per barrel in the base year = \$ 9000

Note that the result is fixed in both years because the prices are unified, yielding real results.

Gross Domestic Product (GDP) and Gross National Product (GNP)

GDP:

Gross monetary values of finished goods and services produced within a domestic economy by the factors of production within a geographic area during a certain period of time, usually a year.

GNP:

Gross monetary values of finished goods and services produced by a country's citizens, whether they are resident in or outside the country, and excluding monetary values of goods and services produced by non-citizens during a certain period of time, usually a year.

GNP:

GDP + net revenues of foreign factors of production (what goes into the economy minus what comes out)

As illustrated above, the GDP reflects the sum of the values of finished goods and services produced by factors of production, residing within a geographical area, but a part of these factors may be owned by non-citizens, which leads to that part of the factors of production revenues owned by non-citizens is transferred outside. At the same time, there are some national factors of production work outside the geographical boundaries of the state, leading to transferring the revenues they get into their home country's economy. The difference between what goes into the economy and what comes out is called "net revenues of factors of production". Thus, the gross national product reflects more accurately the actual productivity of individuals at home. However, this does not mean that the country does not take advantage of the difference between GDP and GNP, as foreign workers, on the other hand, help in the economic development process.¹⁵

¹⁵ It should be noted that the United States has changed the concept of GNP as an essential scale to GDP officially in 1991. The reason for this is the fact that GDP is more effective in reversing reality due the fact that the assets inside the country and owned by foreign investors contribute to the growth and development of the economy, therefore, GNP excludes economic changes as a result of foreign investment.

An Explanatory Example:

Presuming that: Gross Domestic Product = 860 SR, the income of citizens working abroad = 200 SR and that of foreign workers residing in the country = 110 SR. Please, calculate GNP:

$$\text{GNP} = 860 + (200 - 110) = 950 \text{ riyals.}$$

❖ Gross Domestic Product and Net Domestic Product

Gross Domestic Product

The gross monetary value of finished goods and services produced within a domestic economy by the factors of production within a geographic area during a certain period of time, usually a year. Gross domestic product is calculated without excluding the depreciation of capital.

Net Domestic Product:

The gross monetary value of finished goods and services produced within a domestic economy by the factors of production within a geographic area during a certain period of time, usually a year. Net domestic product is calculated after excluding the depreciation of capital.

Net domestic product = Gross domestic product - depreciation of capital

It should be noted that GDP does not take into account the fact that the capital assets of a state, such as machinery, equipment and buildings are being consumed over time. These equipment are wearing out and become obsolete over time. So, we must take into account

their depreciated value as a result of usage, or even its life span when calculating GDP. Therefore, another economic measure can be used, which is the GDP after excluding capital consumption, resulting in a new concept that is more accurate and more credible: "Net domestic product" to reflect the real value of the economy and the value of the current real results not their previous values.¹⁶

An Explanatory Example:

Presuming that: GDP = 1000 SR and after using machines for a year, these machines were assessed and its depreciation of capital became = 90 SR. Please, calculate GDP and net domestic product for the current year:

Gross Domestic Product GDP = 1000 SR

Net Domestic Product = $1000 - 90 = 910$ SR

Regulatory Sectors Contribution to GDP in Real and Nominal Terms

GDP is very important for the development of an economy that is based on policies adopting the GDP value as a gross value. However, it is also important to know the contribution of each individual sector constituting the economy as a whole, as it is useful to know the nature of the economy and its future based on knowing the nature of the most important sector in GDP.

A Comparison of GDP in 1999 and 2013

¹⁶ Usually, the concept of GDP is dealt with because it is difficult to estimate the depreciation of fixed capital.

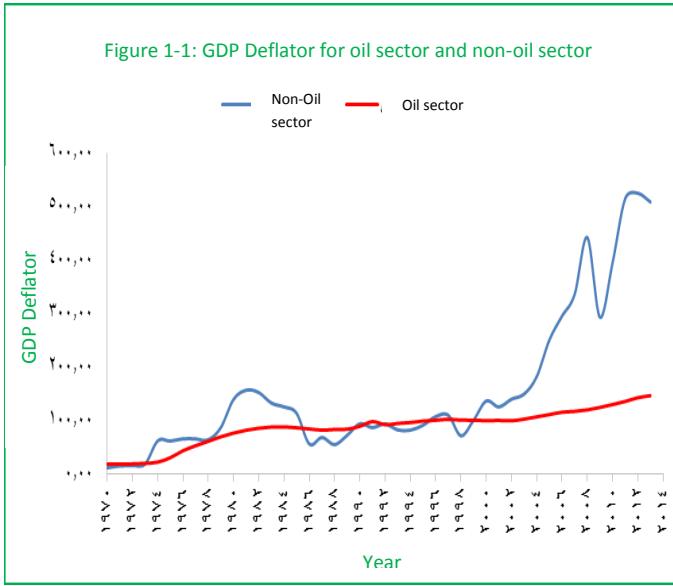
Table 10

GDP by Regulatory Sectors	Nominal		Nominal GDP growth between the two years	Real		Real GDP growth between the two years	GDP Deflator	
Year	1999	2013		1999	2013		1999	2013
Oil -sector	198,988	1,320,248	84.93	198,988	259,398	23.29	100	508.97
Non-oil sector	394,967	1,465,233	73.04	394,966	1,003,359	60.46	100	146.03
GDP	603,589	2,806,686	-	603,589	1,274,314	-	-	

To compare to GDP during two periods, we must control the difference in prices between both years. This will be made through using the real standard because it takes into account the change in the price level. But, if we use the nominal standard, we will get misleading results due to the difference in prices. By comparing the real standard with the nominal standard, we can know prices trend for each sector.

Real GDP of oil sector for 2013 grew by 23.2% as compared to 1999, while that of non-oil sector for 2013 grew by 60.6 % compared to 1999. Consequently, we can notice that real GDP tends to increase. As we see that the real GDP growth of the non-oil sector is high compared to the growth of the oil sector, denoting the quest to diversify the production base, which is one of the development plans objectives in Saudi Arabia.

As for nominal GDP of the oil sector for 2013, it grew by 84.9 % as compared to 1999, while that of the non-oil sector rose by 73% compared to 1999. Nominal GDP tends to increase as well.



By comparing between the real GDP growth of the oil sector in 2013, rising by 23.3%, and the nominal GDP growth of the oil sector for the same year, increasing by 84.9 %, we find that there is a significant increase in the nominal standard. This rise is because the real standard depends on GDP deflator, which is based on the base year 1999 in Saudi Arabia. Therefore, the

GDP in real term was lower as compared to GDP in nominal terms. This is clearly evident in (Figure 1-1) as the implicit GDP deflator for the oil sector in 2013 amounted to 508, 5 folds higher than that of 1999, leading to a significant rise in GDP in its nominal terms.

Regulatory Sectors Contribution to GDP between 1999 and 2013

Table 11

Relative Contribution to GDP by Regulatory Sectors	Nominal		Nominal Contribution growth between the two years	Real		Real Contribution growth between the two years	GDP Deflator 1999=100	
Year	1999	2013		1999	2013		1999	2013
Oil sector	32.97	47.04	29.92	33.0	20.36	-61.96	100	508.97
Non-oil sector	65.44	52.21	-25.34	65.4	78.74	16.89	100	146.03
GDP	100.00	100	-	100	100	-	-	

The nominal contribution of the oil sector to GDP in 2013 went up by 29.9 %, while the nominal contribution of non-oil sector to GDP declined in the same year by 25.3 %. What is the reason behind the low contribution of non-oil sector to nominal GDP in 2013, although the non-oil sector grew, in nominal terms, by 73% in 2013, as shown in (Table 10). This can be explained as: the production growth ratio of the oil sector amounted to 84.9 % in 2013, indicating that it grew rapidly in nominal terms as compared to the non-oil sector because of rapid increase in prices of the oil sector. Thus, the oil sector contribution to GDP increased, while that of non-oil sector decreased.

In real terms, we find that the oil sector real contribution to GDP dropped by 61.9 % in 2013, while that of non-oil sector increased by 16.8 % in the same year. So, what is the reason behind oil sector low contribution to real GDP in 2013, though, oil production sector increased by 23.2 % ,in real terms, in 2013, as shown in (Table 10). This can be elaborated as: non-oil sector amounted to 60.6 % in 2013, which means that the non-oil sector grew rapidly in real terms as compared to the oil sector because of vast quantities produced by the non-oil sector as compared to the oil sector. Unlike the oil sector contribution to GDP that has decreased, non-oil sector contribution to GDP increased.

The one-year comparison between nominal and real GDP may be beneficial in estimating price inflation and deflation. As oil sector contribution to nominal GDP amounted to 47.4 % in 2013, and that of the oil sector amounted to 20.3 % in 2013. So, what is the reason behind the oil sector low contribution to real GDP? This is because to the General Authority for Statistics still depends on the base year 1999 as a GDP Deflator, used in real GDP calculation. The average price of an oil barrel in 1999 was \$ 17.4, but, it was \$ 105.8 in 2013. This is reflected on the GDP deflator value in (Table 11). The GDP deflator of the sector amounted to 508.9 in 2013 while it amounted to 100 in 1999, denoting that a difference is almost five time-folds. Therefore, this is the reason behind the oil sector low contribution to real GDP. Officials, in General Authority for Statistics, say that the base year 2010 will be adopted to measure the GDP deflator soon. This will help in reducing the large decline rate when comparing the nominal and the real standards.

➤ **Determinants of GDP Size**

- ❖ Natural circumstances that man cannot control or predict, such as earthquakes, various weather and climate conditions.
- ❖ A country's political stability that affects the quantity and value of produced goods and services. For instance, wars have a devastating impact on GNP through destroying plants.
- ❖ Quantity and quality of economic resources that determine the quantity and quality of what is being produced and, hence, affecting the value of the GDP.
- ❖ Relationship of factors of production and the surrounding environment, and the extent of implementing the labor decomposition principle in production by the state and utilizing technological advances.

➤ **GDP Calculations Problems**

- ❖ It's difficult to calculate values for each income resulting from an economic activity, such as unannounced properties inhabited by owners, particularly in countries characterized by weak tax accounting departments.
- ❖ It's difficult to calculate monetary values of GDP for some goods and services, such as products that are not traded in the market (i.e. products consumed by their producers), services of a housewife at home, physician, electrician, plumber and carpenter services for the his\her family. Consequently, GDP value appears to be less than the real value.
- ❖ It's difficult to estimate the commodity inventory size and the depreciation of capital for each factor of production as well.
- ❖ The problem of constant change in the general price structures and standard prices, significantly affect, GDP both in its nominal and real terms.

- ❖ The problem of different currency values among countries and the existence of more than one (formal and real) rate for each national currency that may make the comparison between national income of counties inaccurate.
- ❖ Illegal activities (economically known as shadow economy) are not counted in GDP because these activities are carried out using cash or exchanging to evade state control, making them impossible to be calculated.
- ❖ GDP does not reflect negative effects on the environment (i.e. the factories negative effects) as it is very difficult to estimate and subtract from GDP.

Conclusion

The study reviewed the Gross Domestic Product (GDP) concept and other related concepts. Then, it explained (GDP) notion using output approach, expenditure approach and income approach and indicated that those approaches are only different calculation methods that yield the same results. GDP is produced by factors of production, and, hence, they earn income in return for their work and spend that income, money, to consume produced goods and services, which represents the expenditure process. GDP indicator is significant since it summarizes the economic activities carried out by the community during a certain period of time, usually a year. Also, it can be used in economic analyses and the development of plans and policies. Moreover, identifying the incomes of the factors of production may facilitate developing a policy that mange the distribution of income; and by identifying GDP, using expenditure approach, will enable us to pinpoint the main consuming sectors in the economy. Also, GDP indicator may be used as an indicator to compare countries when measuring the economic performance of a country. The study also explained SNA source and the system applied by General Authority for Statistics. In addition, it reviewed approaches for GDP calculation.

Afterwards, the study touched upon the difference between nominal GDP and real GDP. The real GDP is calculated, taking into account the change in prices since the base year,

while the nominal GDP is calculated at current prices for the same year. Therefore, the nominal GDP becomes an inaccurate indicator for comparison between countries or even between different two periods of time for a single country. So, it would be preferable to depend on the real GDP. Also, the difference between GDP and GNP was clarified, as the GNP takes into account adding returns of national factors of production who are outside the country and subtract the returns of foreign factors of production inside the country. Hence, it is better to use GNP to express the real productivity of citizens.

It is known that the value of capital assets, such as machinery, depreciate over time. Thus, the value of such equipment is decreasing and it may become unusable over time. So, a decrease in its value as a result of usage when calculating GDP should be taken into account. Therefore, another economic measure may be used (GDP after excluding capital depreciation), resulting into a new concept that is more accurate and more credible, namely: "net domestic product". This study recommends that the base year for the GDP Deflator should be updated. The base year for GDP deflator, adopted during the study duration is 1999, so that real GDP can reflect an appropriate value for the current price structures. The study also recommends diversifying the production base of the Kingdom to ensure a continued development process that is not affected by fluctuations in oil prices.

References:

Arabic

Sharjabi, Hamid, "Comparing Updates and Changes between 1993 and 2008 System of National Accounts", Khwarizmi Conference, Qatar.

Comprehensive Economic Census, General Authority for Statistics, Saudi Arabia, 2010.

National Accounts, General Authority for Statistics, National Income Statistics, Saudi Arabia, 2013.

Al Habib, Fayez, "Principles of Macroeconomics", Al-Farazdaq Printing Press, Riyadh sixth edition, 2011.

National Accounts: A Practical Introduction, Methods Guide, the Department of Economic and Social Affairs, Series F, No. 85, United Nations, 2005.

National Accounts Statistics, United Nations System of National Accounts for 1993, Central Administration of Statistics, Kuwait, 2012.

Salem, Kotb, "Support for Implementation Strategy for 1993 SNA in the Arab Region", Western Asia (UN-ESCWA) Jordan, 2013.

The Use of National Accounts in Policy Analysis, Approaches Guide, the Department of Economic and Social Affairs, Series F, No. 81, United Nations, 2005.

English

Vanoli, A. A History of National Accounting. IOS Press. Amsterdam. 2005.

System of National Accounts, European Communities, International Monetary Fund, Organization for Economic Co-operation and Development, United Nations and World Bank, New York, 2009

System of National Accounts, European Communities, International Monetary Fund, Organization for Economic Co-operation and Development, United Nations and World Bank, New York, 1993

Michael R. Macroeconomics: Theory and Policy. Prentice-Hall. Third Revised edition. 1987.