الهيئة العامة للإحصاء
General Authority for Statistics

Statistical Methodology

Comprehensive Revision of Gross Domestic Product (GDP)

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Contents

First: Introduction

1. COMPREHENSIVE REVISION OF GROSS DOMESTIC PRODUCT (GDP)

A Comprehensive Revision of Gross Domestic Product (GDP) serves as a reference point for recalibrating the time series of GDP ensuring all components of GDP across all sectors are measured for a specific year. This is in line with the recommendations of the System of National Accounts and the best international practices. A comprehensive revision year provides an updated and comprehensive measurement Saudi Arabia's economy, reflecting its size and structure in addition to ensuring more up-to-date coverage of all aspects to arrive at an accurate measurement of the economy at current prices in a Comprehensive Revision year.

2. THE IMPORTANCE OF A COMPREHENSIVE REVISION OF GROSS DOMESTIC PRODUCT (GDP)

The Comprehensive Revision of Gross Domestic Product (GDP) is essential to reflect the significant structural transformations in the Saudi's economy, especially with the implementation of Saudi Vision 2030 initiatives, the growth of the non-oil private sector, and the expansion of new economic activities. The comprehensive revision of GDP is a fundamental and critical process that ensures the accurate measurement of Saudi Arabia's economy and its alignment with better policymaking and more precise economic analysis. It also provides a more reliable basis for tracking progress toward national economic goals, supporting policy decisions, and facilitating investment and international cooperation.

3. A HISTORICAL OVERVIEW OF THE COMPREHENSIVE REVISION OF GDP IN SAUDI ARABIA

The Comprehensive Revision of Gross Domestic Product (GDP) holds particular importance for the Kingdom of Saudi Arabia in light of the rapid pace of economic transformation and various fundamental changes, including the development of new economic cities, the rapid growth of emerging sectors such as the entertainment sector, the expansion of tourism activities, and the emergence of digital economy services.

The comprehensive revision of GDP better reflects these structural changes, ensuring a more accurate measurement of the Saudi's economy. It also enhances the precision of GDP estimation by updating the shares of activities and components within GDP. Moreover, it improves the international comparability of Saudi Arabia's economic statistics. Given Kingdom's prominent and growing role in the global economy — particularly through its G20 membership and international investments — having internationally comparable economic statistics is more important than ever.

Additionally, the comprehensive revision of GDP provides more accurate inputs that assist decision-makers and policymakers in analyzing and evaluating the economic impact of current policies, conducting more precise

comparisons with other major economies, and helping international investors better understand the structure and potential of the Saudi's economy. It also lays the foundation for formulating and enhancing economic policies based on more accurate and up-to-date GDP figures, supporting Kingdom's efforts to diversify its economic base and move forward in achieving the goals of Saudi Vision 2030.

3.1 The Comprehensive Revision Year 1970

In 1968, the Authority released a preliminary series of Gross Domestic Product (GDP) estimates by economic activity, based on the data available at the time and supported by direct and indirect indicators derived from studies conducted by the Authority since mid-1966. Later, in 1973, the Authority issued the fourth report on national income accounts, benefiting from the availability of new data. This report presented a set of national income estimates for Kingdom of Saudi Arabia, which were prepared — as much as possible — in accordance with the recommendations of the 1968 United Nations System of National Accounts (SNA).

The year 1970 was selected as the base year for this Comprehensive Revision due to the availability of significant statistical data during that year, such as the results of the General Population and Housing Census, the Housing Census, and the Agricultural Census. This made 1970 a suitable year for constructing accurate and updated estimates.

3.2 The Comprehensive Revision Year 1990

The year 1990 was initially considered as a potential alternative base year to 1970, due to the presence of several important factors. These included preparations for conducting the General Population and Housing Census and plans to carry out economic and social surveys that would support the national accounts. Additionally, the year was economically stable prior to regional events, making it statistically suitable in line with the recommendations of the International Monetary Fund (IMF). However, due to the postponement of the census and the economic disruptions that followed those events, along with the unavailability of research results in a timely manner, the year 1990 was excluded. The focus later shifted to selecting a more stable reference year.

3.3 The Comprehensive Revision Year 1999

This year was selected as the new Comprehensive Revision year for Kingdom of Saudi Arabia for several fundamental reasons. First, it marked the implementation of the 1993 System of National Accounts (SNA), which enabled improvements in the accuracy and reliability of economic data. Second, the start of Kingdom's Seventh Development Plan coincided with this year, providing strategic alignment between economic planning and performance evaluation. Lastly, the year 1999 was economically and socially stable, making it a reliable reference point for economic measurements.

The comprehensive revision of GDP for the year 1999 was thus adopted, during which the General Authority for Statistics initiated a number of economic and social surveys following the completion of the General Population and Housing Census in 1992 and the Economic Census in 1993. One of the most significant developments

introduced during the 1999 Comprehensive Revision was the application of revised statistical and economic classifications and systems, such as the classification of economic activities based on the International Standard Industrial Classification (ISIC Rev. 3).

3.4 The Comprehensive Revision Year 2010

This year was selected for the Comprehensive Revision of Gross Domestic Product (GDP) in Kingdom of Saudi Arabia for several fundamental reasons. One of the key reasons was the availability of recent and comprehensive statistical data resulting from the economic census and statistical surveys. This enabled the reclassification and separation of previously aggregated economic activities. For example, the petrochemical industry was separated from other manufacturing industries, resulting in the division of manufacturing into three main categories: petroleum refining, petrochemicals, and other manufacturing industries. This level of detail provided a more accurate picture of the national economic structure.

Additionally, the transport and storage activity were separated from the communications and information technology activity, based on the results of research and economic censuses, leading to more precise classification of these sectors. Furthermore, banking, insurance, ownership of dwellings, and other financial services were also separated to better reflect the developments and changes in the Kingdom's economic structure.

Moreover, the year 2010 witnessed the implementation of updated international statistical classifications and standards, such as the International Standard Industrial Classification (ISIC) Rev. 4, which contributed to improving the quality and accuracy of statistical data.

In summary, the selection of 2010 as the year for the Comprehensive Revision of GDP was driven by the availability of updated data, economic stability, and the application of modern statistical standards, making it a suitable reference point for measuring and evaluating the Kingdom's economic performance.

3.5 The Comprehensive Revision Year 2023

The General Authority for Statistics' decision to conduct a comprehensive revision in 2023 to update the computation and level of nominal in Saudi Arabia is a strategic one, driven by several critical factors. The previously adopted base year, 2010, no longer adequately reflects the significant structural changes that have reshaped the Saudi's economy over the past decade—particularly following the launch of Saudi Vision 2030 and the accelerated economic diversification efforts, the General Authority for Statistics selected 2023 as a comprehensive revision year due both economic and statistical considerations. Specifically, the year 2023 represents a period of economic stability following the recovery from the COVID-19 pandemic, making it an ideal and up-to-date reference point for future economic comparisons. This period aligns with the implementation of significant statistical enhancements and new data availability, including Saudi Census 2022 and comprehensive economic surveys. It also aligns with the updating of classification systems and enhancements in data collection methodologies, which improve the accuracy of representing economic activities in Saudi Arabia. From a technical perspective, the year 2023 provides the General Authority for Statistics with richer data sources than were

previously available, through the execution of statistical surveys, the integration of administrative data, and the availability of new data sources such as point-of-sale transactions and digital platform activities. This enables an improved data system that offers more comprehensive coverage of both established and emerging economic sectors in Saudi Arabia.

4. ENSURING THE QUALITY OF GDP MEASUREMENT IN THE COMPREHENSIVE REVISION

Quality procedures included:

- Automatic verifications in data processing systems.

- Manual review of significant changes or unusual patterns.

- Expert review of applied methodologies.

- Documentation of all methodologies.

GASTAT also promotes transparency in quality assurance by:

- Regular dissemination of methodological updates.

- Clear documentation of statistical procedures.

- Open communication on data updates.

- Regular stakeholder consultations.

- Continuous professional development of statistical staff.

5. ALIGNMENT WITH INTERNATIONAL PRACTICES AND RECOMMENDATIONS

GASTAT has approached the International Monetary Fund (IMF), reviewed countries' experiences, and reviewed international recommendations and SNA2008 manual to ensure the highest standards of harmonization:

- Application of the recommendations of SNA2008.

- Regular consultation with international statistical organizations and request for IMF technical counsel to review the comprehensive revision methodology.

- Benchmarking comparisons with similar economies.

- Application of international best practices and recommendations.

Second: Statistical Definitions and Concepts

1. Gross Domestic Product (GDP)

- **GDP at market prices (Production approach):**

Total value added of resident producers at basic prices plus net taxes on products, or the sum of outputs at basic prices minus intermediate consumption at purchasers' prices plus net taxes on products, which equals (taxes on products - subsidies on products).

- **GDP at market prices (Expenditure approach):**

Total final expenditure at purchasers' prices on goods and services including exports minus imports.

- **GDP (Income approach):**

The sum of compensation of employees, net taxes on production and imports, gross operating surplus, and consumption of fixed capital.

2. SUPPLY AND USE TABLES (SUTS)

Supply and Use Tables represent a comprehensive framework for resources and uses, in accordance with the System of National Accounts 2008 (SNA). These tables provide a detailed analysis of products based on data sources. The Supply Table shows whether products come from domestic production or imports, while the Use Table illustrates how these resources are utilized—whether as intermediate consumption, final consumption, capital formation, or exports.

Terms and Concepts Related to Supply and Use Tables:

- **Institutional unit:**

The unit of economic activity, has the freedom to dispose of its resources from buying, selling, consuming, investing, lending, borrowing and has independent accounting lists. This concept includes legal and social entities

such as enterprises of business, non-profit and government sectors, as well as any individual or group of individuals representing a one family.

- **Economic territory:**

The geographical area under central administration in which people, goods and capital move freely.

It includes:

- Airspace, territorial waters, and continental shelf located in international waters over which the country has rights.
- Regional areas in the rest of the world such as the country's embassies abroad.
- All free trade zones or warehouses subject to customs control. On the other hand, foreign embassies, and the areas of international bodies inside the country are outside the economic territory.

- **Residence:**

An institutional unit is defined as a resident when it has a center of economic interest in the economic territory of a country or group of countries. Residence is a feature of particular importance to an institutional unit from a balance of payments perspective because the system is based on it in determining transactions between residents and non-residents.

- **Price systems:**

The System of National Accounts 2008 clarifies the different bases for the evaluation of supply and use table items, the timing of recording transactions and the mechanisms for moving from one price basis to another, in relation to both the supply table and the domestic production and imports, and the use table, such as intermediate consumption and final consumption of goods and services.

There are three types of prices involved in supply and use table that can be detailed as follows:

- **Basic price:**

The price that the producer receives from the buyer for a unit of a good or service produced as an output minus any taxes paid, plus any subsidies received by the producer on that unit as a result of its production or sale. It does not include any transportation costs charged separately by the product on the invoice.

— **Producer price:**

It is the base price plus taxes on products excluding value-added tax, minus subsidies on products. This price does not include the transportation cost, which appears separately on the purchase invoice, nor trade margins.

— **Purchaser price:**

It is the price paid by the purchaser in exchange for one unit of goods or services of the product, and it is equal to the Producer price plus the value-added tax not deducted from the purchaser and the transportation cost that appears in the invoice separately and the trade margins.

- **Production:**

The value of goods and services produced by the production activity of resident institutional units that use production inputs during the accounting period, including finished, unfinished products, and products for self-use. The valuation is usually based on the producer price, which is the market value.

The production of goods and services includes the following points:

- Production of goods and services with the intention of selling, and in the absence of selling goods, this part is counted within the change in inventory.
- Production of goods and services with the intention of using them in self-intermediate consumption (production in terms of supply and intermediate consumption in terms of use).
- Production of goods and services with the intention of using them for own final consumption (production in terms of supply and final consumption in terms of use).
- Production of goods and services with the intention of using them in the formation of own capital (production in terms of supply and capital formation in terms of use).
- Production of goods and services that are given free of charge to employees within the scope of incentives (production in terms of supply and compensation of employees in terms of initial income distribution and final consumption of families in terms of use).
- Research and development production as an investment (production in terms of supply and capital formation in terms of use).
- Housing services occupied by its owners (calculated via estimated rent).

❖ **Note: Goods that are lost or damaged during production or distribution are not counted in production.**

- Market and non-market production:

The System of National Accounts considers all goods to be market, and therefore the concept of non-market production applies only to the production of services. Production is considered market production if the products are sold at prices of economic significance, that is means, if the selling price covers at least half the cost of production, but if the products are provided free of charge or at prices that have no economic significance, this production is considered non-market.

- Market Goods and Services:

The value of goods and services that are sold in the market or that are mainly prepared for sale in the market at a price aimed at covering the cost of production and making a profit, includes all goods and services domestically produced and those imported.

- Non- Market Goods and Services:

The value of goods and services provided at a price that does not normally cover the cost of their production (Free or at a nominal price) and consists mostly of the production of government activities, non-profit organizations serving families, and domestic work in the household sector. For government and non-profit institutions, production is calculated by the total cost of production (intermediate consumption + compensation of employee + Consumption of fixed capital). This production is considered the final consumption of these sectors.

- Financial intermediation services indirectly measured (FISIM):

The value of financial intermediation services provided by banks and other depository institutions is estimated by the value of loans multiplied by the difference between the lending interest rate and the reference rate plus the value of deposits multiplied by the difference between the discount rate and the deposit interest rate. The SNA recommends distributing this production to the economic activities benefiting from the service (intermediate consumption, final consumption, imports, and exports).

- Insurance services:

The production of insurance institutions is calculated from the difference between the contributions earned plus the returns on shares and investment and the compensation paid.

- Trade Margin:

Trade margins pertain only to goods and represent the difference between the selling price of goods and the purchase price of the goods in the same condition. In some cases, we find produced goods that were not sold, so they constitute an additional inventory of goods, as well as we find selling goods that are taken from the inventory, and therefore the trade margin is calculated in the following way: Sales - purchases + change in inventory (end inventory - beginning inventory). Gross trade margins are considered the production of trade activity.

- Transport margins:

The activity of transporting the goods purchased to the place of delivery; the buyer bears these costs by adding them to the purchase invoice or placing a separate invoice for them.

- Intermediate consumption:

The value of goods and services that are used as inputs to the production process, except for fixed assets whose consumption is considered Consumption of fixed capital. These goods and services are used or consumed entirely in the production process. Some inputs may reappear after they have been transformed and incorporated into outputs while other inputs that may be consumed entirely, such as electricity and similar services.

Intermediate consumption contains:

- Consumable purchases of raw materials (not all purchases because some of them remain in inventory or intermediate consumption is taken from inventory).
- Goods and services produced by the units with the intention of using them for intermediate consumption.
- Maintenance within the limits of operating expenses because major maintenance can be considered as fixed capital formation.

— The cost of electricity, water, fuel, telephone and internet, office supplies (paper, pens, newspapers, magazines...), transportation costs, rent, advisory and research services (studies, accounting, law, advertising...), assignments and costs of seminars, banking services.

- Consumption of Fixed Capital:

The decline, during the course of the accounting period, in the current value of the stock of fixed assets owned and used by a producer as a result of physical deterioration, normal obsolescence or normal accidental damage.

- Government Final Consumption Expenditure:

The value of what the general government spends on individual and collective goods and services. It equals the total production value of the government minus the sum of market sales, taking into account that the total value of government production equals the sum of intermediate consumption of goods and services, compensation of employees, and Consumption of fixed capital.

- Household Final Consumption Expenditure:

The value of spending by resident households on goods (durable and non-durable) and services excluding the purchase of housing and self-building.

- Final consumption expenditures of nonprofit institutions serving households:

It is the value of what these organizations spend on goods and services to provide services to households for free or at nominal prices, it is equivalent to the cost of production minus market sales.

- Gross Fixed Capital Formation:

It is the addition of fixed assets to the stock of assets that producers hold, minus the value of fixed assets disposed by the producers (additions - disposals) during the accounting period, which are used in production for more than one year. Among these assets are housing, buildings and other structures, machinery and equipment, intellectual property products, and productive plants and animals. Gross fixed capital formation also includes spending on services that are added to the value of non-productive assets, such as land improvement, forest development, tree planting and orchards and expenditures on research and

development. The costs incurred when purchasing and disposing of assets (ownership transfer costs) are also considered as part of gross fixed capital formation.

- Change in Inventory:

The market value of change that occurs during the accounting period of inventories including raw materials, goods in progress, finished products, animals for slaughtering, and goods purchased for resale. This represents the difference in the stock value between the beginning and the end of the accounting period.

- Gross Capital Formation:

It is the value of gross fixed capital formation plus the change in inventory.

- Exports of Goods and Services:

The value of goods and services whose ownership is transferred from residents of the country to non-residents and includes exports of goods abroad and goods purchased in local ports by non-resident carriers. Service exports include all services provided to non-residents such as transportation and communications services, insurance, financial services, franchise rights, licensing fees, and personal, cultural and government services.

- Imports of Goods and Services:

The value of goods whose ownership has been transferred or the value of services provided from non-residents to residents and includes goods that cross borders and goods that are purchased in foreign ports by local carriers. It also includes those services provided to residents, including transportation, communications, insurance, financial services, and property rights. Franchise, license fees, personal and cultural services, and government services.

- CIF Price (Cost, Insurance and Freight):

The prices paid by the importer for goods delivered within the country's borders, including any costs related to insurance and shipping or the prices of services provided to a resident prior to the payment of import taxes or any other taxes on imports or on the margins of trade and transport in the country.

- FOB Price (Free On Board):

The price of the buyer paid by the importer to receive a commodity within the borders of the exporting country after loading it on the means of transport and after paying any export taxes or receiving any tax deductions.

- CIF/FOB adjustments:

The price of FOB equal to the price of CIF minus the costs of transport and insurance between the customs borders of the exporting country and the customs borders of the importing country.

- Purchases by residents abroad:

The value of what residents spend outside the borders of the economic region on goods and services.

- Purchases by non-residents inside:

The value of what non-residents spend within the borders of the economic region on goods and services.

- Compensation of Employees:

Includes all amounts owed to employees in return for their work, whether in cash or in kind, before deducting any deductions from them, such as the share of social insurance, taxes and the like.

- Wages and salaries:

The sum of wages and salaries in cash and wages and salaries in kind, before deductions.

- Employer's Social contributions:

The amounts paid by employers on behalf of their employees into social security funds, for insurance, retirement pension funds, or other institutional units responsible for managing social insurance plans.

- Taxes on Products:

These are taxes due on goods and services upon their delivery, sale, transfer, or other disposition by producers, in addition to import taxes, which become due upon entry of goods into the economic territory and crossing borders, or upon provision of services by non-resident units.

- Subsidies on Products:

Includes grants payable by the government to the private and public sector, and subsidies paid by public authorities to government projects to offset the loss caused by the government's policy of keeping the price at a certain level, and it can also be calculated as the difference between the target price and the actual market price paid by the purchaser. This difference will be covered by the government.

- Net taxes on products and imports:

It is the value of taxes on products and imports minus the value of subsidies on products.

- Other Taxes on Production

Other taxes on production include all taxes borne by resident units as a result of their productive activities, regardless of the quantity or value of goods and services produced or sold.

- Other Subsidies on Production:

Subsidies that resident units may receive as a result of their production (excluding subsidies on products), such as wage or labor subsidies, subsidies to reduce pollution rates or the use of certain types of workers.

Third: Data Sources

1. DATA QUALITY

GASTAT uses a comprehensive quality assurance framework to achieve accurately updated GDP figures by implementing multiple review stages and cross-verification procedures for various data sources and methodologies. This approach combines statistical accuracy and economic logic to produce reliable and internationally comparable national accounts statistics.

In general, GASTAT ensures accuracy through comprehensive data collection and verification, beginning with the primary economic surveys, which form the backbone of regular statistics and the comprehensive revision process.

1.1 Economic surveys implemented by GASTAT

a. Comprehensive economic survey (CES)

b. Comprehensive agriculture survey

c. Household income and expenditure survey (HIES)

d. Individuals' producers survey (IPS)

e. Saudi Census 2022

f. Labour force survey (LFS)

g. Annual international trade survey (ITS)

h. Consumer price index (CPI)

i. Wholesale price index (WPI)

2.2 Administration records

Administrative records play a vital role in the estimation methodologies, providing primary measurements and validation tools for survey-based data. Government financial records from the Ministry of Finance provide comprehensive data on public sector activities, including detailed spending patterns, revenue flows, and information on programs.

Central bank administrative data serve multiple purposes, providing crucial information on financial flows, monetary aggregates, and international transactions. These data are particularly important for measuring financial intermediation services and understanding cross-border financial flows.

Labor market administrative records are used to validate and supplement employment data from surveys. These records are particularly valuable for understanding employment patterns in the formal sector and help measure activity in the informal sector through comparison with survey-based employment figures.

Tax administration records provide important information about business activity and help validate survey-based measurements of economic output. These records are particularly valuable for understanding the distribution of economic activity across sectors and regions.

Customs data provide detailed information on international trade flows, supporting the measurement of imports and exports. These data are integrated with survey-based information on local production and consumption to ensure comprehensive coverage of product flows across the economy.

Each administrative data source undergoes careful quality assessment before being integrated into the national accounts' framework. This includes evaluating coverage, classification systems, and timing patterns to ensure compatibility with other data sources and alignment with national accounting concepts.

Among the most important administrative records used in the National Accounts and compilation of Gross Domestic Product (GDP) are:

a. Saudi Central bank:
   - Balance of payment
   - Point of sales
   - GDP forms for financial sector enterprises

b. Ministry of finance:
   - Final budget account
   - Budget of extrabudgetary entities

c. Ministry of energy:
   - GDP forms for oil companies
   - GDP forms for electricity companies

d. ZATCA:
   - Sales and revenues of by economic activities

e. Capital market authority:
   - Financial reports of capital market companies
   - GDP forms for capital market authority

f. General organization for social insurance:
   - The annual report for GOSI
   - Number of contributors by economic activity

g. Ministry of Human Resources and social development:
   - Number of employees by economic activity

h. Specialized development funds:
   - GDP forms for the specialized development funds

2. DATA CONSISTENCY

Data consistency is maintained through a comprehensive validation framework that operates on multiple levels. At the source level, each dataset undergoes strict quality checks before being integrated into the national accounts' framework. This includes checking historical patterns, cross-validation with relevant indicators, and validating data according to international standards.

Consistency between sources is ensured through systematic comparison of overlapping measurements. When the same economic phenomenon is included from multiple sources, such as employment figures from labor force

surveys and establishment surveys, GASTAT applies reconciliation procedures to resolve discrepancies. This often involves a detailed investigation of methodological differences and careful adjustment for coverage standards.

3. DATA GAPS

GASTAT adopts a systematic approach to address data gaps. When primary data sources do not provide complete coverage, multiple strategies are implemented to ensure comprehensive economic measurement.

Supply and use tables help to detect gaps between different data sources and rely on productivity measures, historical indicators and commodity flow methodology to detect and address gaps. This includes tracking products across the economy from production or import to end-use, helping to identify and value lost economic activities especially when some economic activities lacking recorded revenues, such as construction projects in progress.

The informal sector faces specific challenges regarding data coverage. GASTAT addresses these challenges through multiple estimation methods, comparing labor force survey data with employment records in the formal sector, integrating data from delivery apps, and incorporating information from freelance work licenses. This multi-source approach helps ensure comprehensive coverage of informal economic activities.

4. MAIN CLASSIFICATIONS

Several statistical classifications have been used as follows:
1. The International Standard Industrial Classification for the Economic Activities (ISIC4)
2. Classification of Individual Consumption According to Purpose (COICOP)
3. Classification of the functions of government (COFOG)
4. Central Product Classification (CPC2.1)
5. Harmonized System of Foreign Trade Classification (HS)
6. Balance of Payments Manual according to the sixth edition (PBM6).

Fourth: Methodology for Measuring the GDP of the Main Sectors

1. KEY IMPROVEMENTS IN THE METHODOLOGY FOR MEASURING THE GDP

GASTAT implemented significant methodological improvements in the comprehensive revision year 2023, enhancing the accuracy and comprehensiveness of measuring the GDP of Kingdom of Saudi Arabia. These improvements extend to data collection, classification systems, measurement techniques, and sector coverage, creating a more robust framework for measuring economic activity in the Kingdom.

2. GOVERNMENT SECTOR

There were several major updates to the measurement of the government sector incorporated as part of the comprehensive revision. GASTAT established a clear framework for government activities using detailed final account data from the Ministry of Finance for 2023. These activities were classified according to the Classification of Functions of Government (COFOG) and linked to the International Standard Industrial Classification for the Economic Activities (ISIC4) providing an accurate measurement of the value added by government activities.

In the sector, one of the key improvements was the reclassification of development funds and the Capital Market Authority from government activities to the financial sector, in line with international standards in both the SNA 2008 and the Government Finance Statistics 2014 (GFS) Manual. This change provides a clearer framework for both the government sector and the financial sector. Government sector measurement now includes the sector's share of (FISIM) in intermediate consumption, calculated based on the allocation of loans and deposits by the central bank. This impacts both the measurement of government activity output and the results of final government consumption expenditure.

The methodology for calculating final government consumption expenditure was also enhanced to include services provided by the central bank on behalf of the government, measured using a cost-based approach supported by statistical forms from the central bank.

CLASSIFICATION AND TREATMENT OF DIFFERENT TYPES OF TAXES

An improved tax classification in line with international standards and reflecting the tax structure of the Kingdom of Saudi Arabia has been applied. An important change in the treatment is the reclassification of some types of taxes, such as the real estate transaction tax and the taxes on the transfer of ownership of foreign real estate, from other taxes on production to taxes on products, which affects the net taxes on products and thus GDP by production approach. This update is in line with international standards and guides, such as the GFS Manual and the SNA 2008, as the tax classifications follow the Government Finance Statistics standards approved and used by the Ministry of Finance to record transactions in the final budget account for each year. This treatment ensures consistency between the national accounts and government finance statistics while maintaining international comparability. The estimation of real net taxes has also been updated to better align with international recommendations.

3. FINANCIAL SECTOR

The estimates of the financial sector have witnessed significant improvements, particularly in the measurement of Financial Intermediation Services Indirectly Measured (FISIM) and the allocation of these services to institutional sectors and economic activities.

MEASUREMENT OF OUTPUT OF FINANCIAL SECTOR

The financial sector's measurements have been comprehensively updated to reflect the evolving financial system in Saudi Arabia. The new methodology addresses different types of institutions through tailored approaches:

- For the central bank, both cost-based and revenue-based approaches are now used. The cost-based approach includes operational expenses, employee compensation, and capital consumption, while the revenue-based approach covers fee-based services and financial intermediation services.
- Commercial banks' measurements now include both direct production (fees, foreign exchange income) and FISIM, which were allocated across institutional sectors based on loan and deposit patterns.
- Development funds have been integrated into the financial sector, improving the overall coverage of the sector.

FISIM CALCULATION METHODOLOGY

FISIM represents implicit financial services provided by banks, but for which they do not charge explicit fees. FISIM was calculated using the reference interest rate method based on the Saudi Interbank Offered Rate (SAIBOR), where the calculation is made according to the following structure:

FISIM loans= Loan balances ×(interest on lending - reference rate)

FISIM deposits= Deposit balances ×(reference rate - interest on deposit)

Total FISIM= FISIM loans + FISIM deposits

Where the distribution across sectors depends on the sectoral loan and deposit data provided by the Central Bank data, and financial intermediation services are allocated to each sector based on its share of the total of those loans and deposits, then they are added to the intermediate consumption of the productive sectors while they are added as final consumption for the household sector.

This improved methodology ensures that financial services are correctly reflected in the production and consumption accounts of each sector, providing a more accurate picture of financial intermediation in the economy.

4. NON-FINANCIAL SECTOR

The measurement of the non-financial sector has been updated through an improved structure from supply and use tables. Detailed comprehensive economic survey data have been used at the level of the

fourth digit of the International Standard Industrial Classification for the Economic Activities (ISIC4) and the third digit of the Central Product Classification (CPC 2.1). Major updates include:

- Improved estimates of wholesale and retail trade margins
- Improved allocation of FISIM on the basis of sectoral deposits and loans
- Improved measurement of construction projects in progress
- Improved measurement of Research and Development services
- More accurate measurement of intermediate consumption through detailed technical coefficients.

5. HOUSEHOLD SECTOR

The estimates of household final consumption expenditure have been updated through the Household Income and Expenditure Survey (HIES), integrating data from point-of-sale transactions, imports, electronic payment systems, and measures of consumption and expenditure for the year 2023. The new methodology better clarifies international transactions, including the spending of residents abroad and the spending of non-residents within Kingdom of Saudi Arabia. Consumption from self-production, especially in agriculture, is now measured more accurately through improved survey methods.

MEASUREMENT OF HOUSEHOLD EXPENDITURE AND RELATED ACTIVITIES

The measurement of household activities and consumption has been updated with several key improvements. The 2023 Household Income and Expenditure Survey (HIES) data has been comprehensively revised and updated, with the updated 2023 expenditure classifications being linked to the 2018 survey version with the Central Product Classification (CPC 2.1). Key improvements include:

- Integration of point of sale and electronic payment system data
- Better measurement of own account consumption
- Improved measurement of international transactions (residents abroad and non-residents locally)
- Improved measurement of financial services used by households
- Better coverage of digital consumption patterns

The methodology also distinguishes between cash and non-cash expenditures, providing a more comprehensive view of household consumption patterns and living standards.

6. NON-PROFIT INSTITUTIONS SERVING HOUSEHOLDS (NPISH) SECTOR

The measurement of activities within the non-profit sector has been updated through several key improvements. Statistics on non-profit organizations have become the primary source of data for this sector, providing essential financial, operational, and employment information that accurately documents the activities of these entities.

In addition, other supporting data sources are used, including:

- The Comprehensive Economic Survey, which provides technical coefficients that contribute to estimating input requirements and cost structures.
- Administrative Records, where government databases help validate and support the results by providing additional reliable data.

7. AGRICULTURAL SECTOR

The measurement of agricultural activities has been enhanced by integrating multiple data sources to improve coverage. Primary data come from two main sources: The Comprehensive Agricultural Survey and the Survey of Individual Producers, which provide comprehensive coverage of agricultural activities.

MEASUREMENT OF AGRICULTURAL ACTIVITIES

The estimates of different agricultural activities have been improved and are divided as follows:
- Crop production: divided by type (cereals, fodder crops, vegetables, etc.)
- Livestock production: including livestock on and off-holdings as well as production for capital formation.
- Fisheries production: including aquaculture and marine fishing
- Honey and wild truffle production activities

The estimates include the value of sold production and total production, with estimates of intermediate consumption for each type of activity. The updated methodology also better considers production for own consumption.

8. INFORMAL SECTOR

The Individuals Producers Survey played a key role in enabling more comprehensive measurement of the informal sector through multiple estimation methods. These included leveraging data from the Labor Force Survey, delivery application platforms, and freelance work permits.

The Comprehensive Economic Survey was utilized to integrate various methodologies for estimating the informal sector's contribution to GDP, such as the residual approach that compares administrative records with survey data. Other sources were used, including data on domestic workers working in non-recruitment occupations.

In addition, data from the Household Income and Expenditure Survey was used to estimate the number of individuals working independently outside establishments in an informal manner.

9. EXTERNAL SECTOR

The measurement of this sector in the Gross Domestic Product (GDP) has been improved through the integration of various classifications, notably the Harmonized System (HS) and the Central Product Classification (CPC).

Data from the Saudi Central Bank's report on service exports and imports served as a primary source, particularly for aggregated categories such as construction, financial services, travel, telecommunications, and others. Each category was further broken down according to the CPC classification.

Additionally, expenditures by residents abroad and non-residents within the country were allocated based on product types, and the commodity and service basket representing the household expenditure structure was identified accordingly.

Fifth: Supply and Use Tables Sectors

The Supply and Use Tables provide a comprehensive and consistent view of the economy in terms of economic activities and products. The Supply Table illustrates the sources of product supply within the national economy whether domestically produced or imported. In contrast, the Use Table details the uses of these products, including intermediate consumption by economic activities, final consumption expenditure by households, government, and non-profit institutions serving households (NPISH), gross fixed capital formation, changes in inventories, and exports, all at the product level.

1. STRUCTURE OF SUPPLY AND USE TABLES

The Supply and Use Tables consist of harmonized matrices that require accurate and comprehensive data. Depending on the precision and level of detail of the available information, a specific level of activity and product classification is selected. Accordingly, the International Standard Industrial Classification of the Economic Activities (ISIC4) is used for classifying activities, while the Central Product Classification (CPC 2.1) is applied for products. These classifications are chosen to match the level of statistical detail available while ensuring consistency and alignment with international standards.

1.1 COMPONENTS OF THE SUPPLY TABLE

The supply table consists of three matrices:

- **Domestic production matrix:** This matrix is the intersection between activities and products (goods and services) which itemizes what products each activity produces (vertically) and what products are produced by different activities (horizontally). The sum of the columns represents the

production of each activity separately, while the horizontal sum represents the economy's production of a product.

- **Import matrix:** This matrix includes goods imports, services imports, and CIF/FOB adjustments for each product.
- **Price matrix (margins and taxes matrix on products):** This matrix includes trade margins, transportation margins, and net taxes on products for each product.

1.2 COMPONENTS OF THE USE TABLE

The use table consists of three matrices:

- **Intermediate consumption matrix:** This matrix consists of columns (activities) and rows (products). It shows vertically the details of intermediate consumption (products) for each activity and horizontally it shows the intermediate consumption of each product by different activities in the economy.
- **Final consumption expenditure matrix:** It consists of columns for each of; household final consumption expenditure, government final consumption expenditure, non-profit institutions serving household final consumption expenditure, fixed capital formation, change in inventory and exports for each product (rows).
- **Value-added matrix:** This matrix consists of rows for value-added, compensation of employees, net other taxes on production, consumption of fixed capital formation, and gross and net operating surplus for each economic activity (columns).

2. FRAMEWORK OF THE SUPPLY AND USE TABLES

The new framework of the Supply and Use Tables offers a detailed view of the inter-relationships of all economic activities and product flows within the Saudi economy. The Supply and Use Tables 2023 have been utilized in estimating the Gross Domestic Product (GDP) at current prices using all three approaches: production, expenditure, and income.

These tables integrate a wide range of data sources and data gaps and inconsistencies, providing a comprehensive and coherent picture of the national economy. They deliver a substantial volume of information that can be used to analyze GDP results from various perspectives, serving the needs of decision-makers, policymakers, and development program planners. This includes identifying leading economic activities and directing investments and incentives accordingly.

The methodology for constructing the SUTs components follows a commodity flow approach, which helps bridge gaps in the Supply and Use framework and ensure balanced and comprehensive sectoral coverage. This leads to a more accurate depiction of inter-industry relationships and the contribution of each sector to GDP.

Sixth: Historical Data of Gross Domestic Product (GDP)

1. HISTORICAL TIME SERIES DATA FOLLOWING THE COMPREHENSIVE REVISION 2023

Historical GDP estimates were updated through a back-casting model that considered the new comprehensive revision 2023 levels computed and historical data to ensure time series consistency. The model used advanced statistical techniques to maintain the integrity of historical trends while incorporating methodological changes and improved classifications. This ensured that historical comparisons remained valid with the updated series.

1.1 THE CONCEPT OF BACK-CASTING

Back-casting is a statistical process that was used by GASTAT to revise historical GDP data after implementing the comprehensive revision 2023. The process ensured that the economic time series remained consistent and comparable across time periods. Data revisions implemented by GASTAT include both mathematical back-casting as well as updates to estimates resulting from methodological improvements, additional data sources and structural changes in the economy. Without revising the historical time series and back-casting, there would be a break in the GDP series in 2023, making it impossible to properly analyze economic trends or calculate growth rates.

To understand how back-casting works through a practical example, suppose that the new methodology and estimates produce a value for 2023 that differs significantly from the previous estimate of that period. Adopting this new value for 2023 while leaving historical data unchanged would create an artificial increase or decrease in the series. Instead, the difference in the new value versus the old value is distributed backward over time in an economically sound manner known as the "exponential adjustment model."

Quarterly data adds further challenges. Once annual figures were computed, they were reconciled with quarterly values using the IMF-approved quarterly distribution function while maintaining reasonable seasonal patterns in quarterly series.

1.2 THE IMPORTANCE OF BACK-CASTING

The importance of back-casting of results goes beyond mere statistical consistency. They are necessary to/for:

- Economic policy analysis that requires a long time series
- Investment decisions based on historical trends
- International Comparison of economic performance
- Research into structural economic changes
- Understanding the real path of economic development

The process requires comprehensive verification to ensure that:

- Results provide economically logical growth trends
- Sectoral relationships are respected while maintaining logical trends
- Quarterly trends correspond to annual totals
- Maintaining international comparability
- Maintaining the analytical usefulness of the data

The General Authority for Statistics updated the historical GDP estimates from 2011 to 2023 to reflect both the enhanced methodologies and structural changes in the economy. The effects of the back-casting process vary across sectors, depending on the nature and characteristics of each activity and industry.

Seventh: Real GDP

Most economic statistics are presented in monetary values (e.g., Saudi Riyals in the Kingdom of Saudi Arabia), derived from accounting records, transactions, surveys, or other data sources. These are referred to as nominal values because they are not adjusted for inflation or price changes over time. Changes in nominal values over time result either from a change in the quantity of goods or services or from a change in their prices. The General Authority for Statistics (GASTAT) has several statistical surveys that produce nominal value estimates, along with corresponding price data. By combining this information (or through other methods), real estimates can be calculated. Real economic statistics adjust nominal values to account for the effects of price changes, ensuring that changes in real values are not distorted by inflation or deflation.

1. REAL GDP BACKGROUND AT GASTAT

Real economic statistics — such as real GDP — reflect changes in the volume of the variable, thereby providing meaningful insight into the actual economic reality. They are vital tools for decision-making and policy formulation. It's important to note that real measures are not a replacement for nominal estimates, but rather complementary to them. Real estimates are used alongside nominal values and price data, each serving different analytical purposes.

1.1   REAL GDP BY CONSTANT PRICES (2010)

Real GDP was initially calculated using a fixed base year (constant prices) methodology. In this approach, estimates are presented as real values. The original base year used was 2010, meaning that the structure of the real estimates

was derived from the nominal values of that year. The relative importance (weight or share) of each sector or economic activity reflected its 2010 significance.

While the fixed base methodology has been long used and widely accepted, it comes with key limitations. As an economy's structure evolves, a fixed base becomes less representative. The further the time moves from the base year, the less relevant the base structure becomes. recommendations previously advised frequent rebasing (at least every 5 years) to address this issue.

1.2   REAL GDP BY CHAIN LINKING (2018)

In March 2024, coinciding with the release of Q4 2023 results, GASTAT updated the methodology for measuring real GDP. The approach shifted from fixed base (2010 prices) to chain linking. At that time, real GDP estimates were revised for the entire historical series — annual data from 1970 onward and quarterly data from Q1 2010 onward. The reference year for indices and real values in Riyals was also updated to 2018.

2.   CHAIN LINKING METHODOLOGY

As previously discussed, fixed-base volume measures can lose accuracy over time as relative component weights change. For instance, in household final consumption, consumers tend to purchase more of the goods whose prices fall and less of those whose prices rise. This substitution behavior causes substitution bias in fixed-base estimates because updated consumer preferences are not captured. Chain linking addresses this issue by updating the base weights every year. It essentially rebases the series annually. Estimates for year Y-1 use the structure of Y-0, estimates for Y-2 use Y-1, and so on. The results are combined (or "chained") by compounding each year's indices. Chain linking is internationally recommended for real GDP estimation. Although it results in non-additivity (i.e., components may not sum to their aggregate), its benefits outweigh this limitation.

2.1 THE IMPORTANCE OF CHAIN LINKING

- Reducing the bias of an old base year: The fixed-base year method did not effectively account for changes in consumer preferences and spending patterns over time, whereas the chain-linking methodology incorporates periodic updates to weights and measures, ensuring that our GDP calculations reflect current economic realities and consumer choices.

- Reflecting recent price changes: Previously, the Authority relied on outdated weights that did not reflect the changing relative prices over time, whereas the chain-linking methodology allows for annual updates. This means that price changes are more accurately represented in GDP estimates, ensuring a more precise reflection of the economic reality.

- Better reflecting structural changes: The economy of the Kingdom of Saudi Arabia has become more dynamic than ever, with continuous changes in the quality and types of goods and services produced—changes that the fixed-base year method was not able to adequately capture. However,

the chain-linking methodology accommodates these changes, providing a clearer picture of the economic contribution of different sectors.

2.2 INDEX AND VOLUME MEASURES

Real GDP presented as real values or indices. The index method is widely used, where a specific year is selected as the reference year and given a value of 100. The index is computed by dividing each value in the original series by the value in the base year and then multiplying by 100. For quarterly or sub-annual estimates in the reference year, the average will be equal to 100. This applies to all index series.

The difference between the two formats is that in the reference year, each component equals 100 in the index format or equals its nominal value in real value format. In either case, the level of the series itself is not meaningful, as the reference year can be any point in the series. The focus is on growth and change over time, not absolute values. Real GDP is also presented in chained 2023 Riyals, which mirrors the index approach. Both formats are intended to show rate of change, not the value level itself. It should be noted that the current reference year for real GDP indicators became 2023 = 100, previously 2018 = 100.

Outside the reference year, real values can offer insight into the relative size of components within aggregates, though not their precise weights (due to non-additivity). In the reference year, however, real values are additive and match the nominal values, thus accurately reflecting component shares in the total.

3. SEASONAL ADJUSTMENT METHODOLOGY

Seasonal adjustment is the process of separating a time series into its components to reveal underlying economic trends and irregular movements in the series that may be hidden by the usual ups and downs of an unadjusted time series. This process is widely used in statistics as a technique to enable proper interpretation of time series data. Seasonal adjustment is thus a mathematical process of estimating and removing regularly recurring seasonal and calendar effects, commonly referred to as seasonality. Once removed, the remaining seasonally adjusted series represents the trend cycle and irregular components, allowing for easier analysis and identification of underlying long-term trends and short-term movements in a consistent time series.

3.1 USE OF SEASONALLY ADJUSTED DATA

Seasonally adjusted data can be used as supplementary data to the original time series, allowing users to compare data across periods (quarters) without the influence of seasonal and calendar effects. Seasonally adjusted data are not intended to replace unadjusted data, but rather to be used alongside unadjusted data, as they allow users to identify underlying trends and short-term movements more easily in a series that may be hidden or difficult to observe in the original unadjusted series.

3.2 APPLICATION OF SEASONAL ADJUSTMENTS

The core adjustment process utilizes the TRAMO-SEATS in JDemetra+, which utilizes ARIMA model-based seasonal adjustment method to separate seasonal components from trends and irregular movements.

For key economic indicators, GASTAT applies these adjustments at detailed levels before aggregation. For example, in retail trade, individual components are seasonally adjusted before being combined into total retail figures. This approach, known as indirect seasonal adjustment, preserves the inherent seasonal patterns of various economic activities while ensuring that the adjusted series retain their additional characteristics.

This process pays special attention to the seasonal patterns specific to Saudi Arabia, such as the effects of Ramadan and the Hajj season, which may occur at different times in the Gregorian calendar. The effects of these moving holidays are addressed through specialized regression techniques within the seasonal adjustment framework.