GHANA STATISTICAL SERVICE

Monthly Indicator of Economic Growth (MIEG)

Technical Manual

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1.0 Introduction

1.1 Overview

In today's climate of heightened uncertainty and economic volatility, timely and frequent data on economic activity is more critical than ever. To meet this growing demand, the Ghana Statistical Service (GSS) has introduced the Monthly Indicator of Economic Growth (MIEG). The MIEG is an innovative new statistic that provides up-to-date insights into Ghana's economic performance on a monthly basis.

The MIEG represents a major advancement in economic reporting, offering an index that tracks short-term changes in economic activity. As one of the first official monthly indicators of economic performance in Africa, it positions the GSS at the forefront of statistical innovation on the continent and reaffirms its status as a globally respected national statistical agency.

This high-frequency indicator will serve a broad spectrum of users including policymakers, central bankers, business leaders, investors, researchers, development partners, and civil society organizations.

It delivers several key benefits to these users:

- Timely insights to support swift and evidence-based policy responses;
- Frequent updates to monitor the effectiveness of policy interventions;
- More frequent information to support the forecasting of activity ahead of quarterly and annual GDP estimates;
- Monthly information about the drivers of the changes in economic activity;
- A deeper understanding of how business cycles and external shocks impact the Ghanaian economy.

The introduction of the MIEG marks a significant milestone in Ghana's data ecosystem. It reflects the GSS's commitment to empowering decision-makers with reliable, high-quality statistics that drive sustainable national development.

1.2 About this technical manual

The technical manual presents the methodology used to compile the MIEG, which is grounded in the System of National Accounts (SNA 2008). This approach was developed with the support of international partners, including the International Monetary Fund (IMF) and the Office for National Statistics (ONS). By adhering to the SNA 2008 framework, the methodology ensures both consistency and comparability across countries. It also aligns the MIEG closely with Ghana's existing National

Accounts publications, namely the Quarterly National Accounts (QNA) and the Annual National Accounts (ANA).

Adopting an internationally recognized framework for producing economic statistics offers several key advantages. First, it enhances transparency and accountability by providing a clear, reviewable methodology. Second, it establishes a standardized process that ensures consistency in data collection, processing, and analysis, both over time and across countries. This enables users of the MIEG to track trends effectively and apply the data to evidence-based policymaking. Finally, it strengthens the quality and reliability of the statistics, reinforcing stakeholder confidence at both the domestic and international levels. Reliable measures of economic activity are essential to fostering economic stability, attracting investment, and supporting international cooperation.

1.3 The National Accounting Framework

Gross Domestic Product (GDP) is one of the key economic indicators produced by the Ghana Statistical Service (GSS). Both the Quarterly National Accounts (QNA) and the Annual National Accounts (ANA) are compiled using the national accounting framework recommended in the System of National Accounts (SNA 2008). The MIEG is also developed within this framework, ensuring consistency with the macroeconomic statistics already published by the GSS.

The SNA 2008 methodology for measuring high-frequency indicators of GDP follows a bottom-up approach, requiring estimates of all components of the aggregate (IMF, 2020). In practice, this means that detailed source data must be collected for each area of economic activity, which can then be aggregated to produce the overall MIEG. However, high-frequency granular data may not always be available or of sufficient quality. In such cases, statistical technique and informed assumptions are applied to enhance data quality or to impute missing values.

The MIEG is designed to provide a timely signal of changes in economic activity within the quarter, balancing reliability and accuracy with frequency and speed of release. By adhering to the national accounting framework, it serves as a robust macroeconomic indicator of output and a valuable early approximation of QNA growth trends.

1.4 Contents of the technical manual

Chapter 1 established the role of the MIEG in Ghana's economic development and highlighted the Ghana Statistical Service's commitment to producing high-quality data. Chapter 2 examines the MIEG's data sources and scope, detailing where the source data originates and defining its boundaries. Chapter 4 focuses on data processing, with particular attention to the use of value-added tax data.

Chapter 5 discusses seasonal adjustment, followed by Chapter 6, which addresses data dissemination and reporting, emphasizing how the MIEG integrates into the existing National Accounts release calendar. Chapter 7 outlines the revisions policy,

and Chapter's 8 and 9 conclude with acknowledgments and contact information, respectively.

Together, these chapters offer a comprehensive overview of the MIEG methodology and provide clear guidance on how the data should be interpreted and applied. We also recommend users to read the *MIEG User Guide*. This document provides concise and simple instructions on how to interpret the MIEG, as well as key information on the release schedule.

All of the MIEG publications and documents are available on our website.

2.0 Data sources and scope

2.1 Introduction

This chapter explores the data sources we use for the compilation of the MIEG. The activity classification used for presentation of the QNA estimates is based on the ISIC Rev.4. The main sector groupings for the QNA and ANA are given below and are discussed in detail in subsequent sections.

1. Crops
2. Livestock
3. Forestry and logging
4. Fishing and aquaculture
5. Mining and quarrying
6. Manufacturing
7. Electricity, gas, steam and air conditioning supply
8. Water supply, sewerage, waste management and remediation activities
9. Construction
10. Wholesale and retail trade; repair of motor vehicles and motorcycles
11. Transportation and storage
12. Accommodation and food service activities
13. Information and communication
14. Financial and insurance activities
15. Real estate activities
16. Professional, Administrative, and Support Service Activities
17. Public administration and defence; compulsory social security
18. Education
19. Human health and social work activities
20. Other service activities

The MIEG uses covers all the sectors in the economy. However, it is not published at the sector disaggregation shown above. The publication aggregates to the broad sector groupings of agriculture, industry, and services. Agriculture includes crops, livestock, forestry and logging, and fisheries. Industry includes mining and quarrying, manufacturing, electricity, water and sewerage, and construction. Services include all the remaining sectors covered in the list above, from wholesale and retail trade to other service activities.

Despite being published at broad industry group level, the MIEG uses source data covering most of the sub-sectors. See Annex 1 for a full list of what sectors are included in the MIEG. For each sector we use at least one source of data as an indicator for economic growth. As far as possible we have selected an indicator which is used in the QNA. This ensures that growth in the MIEG will be an accurate predictor of growth in the quarterly GDP.

The scope, coverage, source, and methodology for each sector and sub-sector for the MIEG is explained below. However, before that we outline some key concepts to help with interpreting the data.

2.2 Real and Nominal changes in economic activity

Over time, the current values of transactions involving goods, services, and assets can be decomposed into two components: changes in prices and changes in quantities. The MIEG is expressed in real terms, meaning it isolates changes in economic activity by holding prices constant. This allows growth in the MIEG to be interpreted as an indicator of real growth measured in volumes.

While the Quarterly National Accounts (QNA) are published in both real and nominal terms, the MIEG focuses exclusively on real activity. Current prices are not collected for its compilation due to data limitations and the need for timely reporting.

Many indicators used in the MIEG are already available in volume terms. For example, the volume of fish caught (metric tonnes), crude oil production (barrels), and mobile data consumption (megabytes) can be directly incorporated, as they reflect changes in quantity. However, not all flows and stocks can be measured this way. In the manufacturing sub-sector, for instance, business turnover reported in value-added tax (VAT) returns is expressed in current Ghana cedis. As such, the figures reflect both price and volume changes, which must be separated.

To address this, current-price values are deflated using relevant price indices. Depending on the sector, this may involve applying the monthly Consumer Price Index (CPI), the monthly Producer Price Index (PPI), or activity-specific sub-indices. Both CPI and PPI are produced by the GSS and are indispensable inputs into the compilation of the MIEG, ensuring that nominal values are accurately converted into real measures of activity.

2.3 Gross Value Output and Gross Value Added

The data sources used in compiling the MIEG primarily measure changes in output. Accordingly, the indicators driving the MIEG serve as proxies for changes in the Gross Value of Output (GVO) of their respective sub-sectors.[1]

By contrast, the Quarterly National Accounts (QNA) and Annual National Accounts (ANA) are measured in terms of Gross Value Added (GVA). GVA represents the contribution of labour and capital to production, capturing value creation by deducting the intermediate costs of goods and services consumed in the production process. At the economy-wide level, the System of National Accounts (SNA 2008) defines gross domestic product (GDP) as the sum of gross value added across all activities plus taxes and less subsidies.

To estimate GVA at the quarterly and annual level, data on intermediate production costs is required. These are collected through detailed, nationally representative surveys of businesses and other institutional units. However, such data are resource-intensive to compile. The most recent collection was conducted during the 2013 base year. New surveys, including IBIS II and GLSSS, are currently underway to establish a 2023 base year, which will provide updated intermediate cost ratios reflecting current macroeconomic conditions. Until then, estimates continue to rely on the 2013 data.

The 2013 survey results are used to calculate intermediate cost ratios for each economic activity. These ratios represent the share of intermediate consumption in total output at base year prices. Held constant over time, they are applied to current estimates of GVO to derive corresponding estimates of GVA. Equation 1 illustrates this calculation for activity *i* at time *t*.

EQUATION 1: GVA FORMULA

$$GVA_{i,t} = GVO_{i,t} - (GVO_{i,t} \times IC\ ratio_{i,2013})$$

In the QNA, GVA for each sub-sector is calculated using a formula that incorporates intermediate costs. By contrast, the MIEG relies primarily on changes in output without applying intermediate costs. This approach is appropriate because the MIEG is designed as a volume indicator of economic growth. With intermediate cost (IC) ratios held constant over time, the growth rate of output is identical to the growth rate of GVA. As a result, measuring changes in output provides an accurate and reliable predictor of value-added growth, without the need to explicitly account for intermediate costs.

However, in certain cases, monthly GVA estimates are computed. This is necessary when sub-sector indicators combine activities with differing IC ratios. For example, in manufacturing, turnover data from multiple activities are aggregated into a single indicator, but each activity has its own intermediate cost structure. In such cases, the

[1] In some instances, we use monthly GVA as an indicator to ensure a more accurate indication of the QNA growth. See Appendix 1 to identity sectors which use GVA indicators.

identity between output growth and GVA growth does not hold for the aggregate series. To address this, activity-specific IC ratios are applied, and monthly GVA is estimated directly.

Whether output or GVA is used, the MIEG is designed to align as closely as possible with QNA growth estimates. It can therefore be interpreted as a reliable early indicator of GVA growth.

2.4 Crops

2.4.1 Scope and coverage

This sector covers the cultivation of crops and animal natural resources, comprising the activities of growing crops, raising and breeding of animals, harvesting of timber, and other plants, animals or animals' products from a farm or their natural habitats. Food crop estimates cover twenty-seven different crops categorized into cereals, root tubers and starchy, leguminous, vegetables and fruits.

The crops covered include maize, rice, millet and guinea corn/sorghum, cassava, cocoyam, yam and plantain, groundnuts, soya beans, oil palm, shea nut, okra, tomatoes, garden egg, onion, shallot, pepper, and other fruits.

2.4.2 Source of Data

Statistics Research and Information Directory (SRID) at the Ministry of Food and Agriculture (MOFA) provides information on crop production and a crop budget obtained from an extensive annual sample survey of farming in all sixteen regions. They use crop cutting and field measurement approaches to obtain crop yield, area under cultivation for each crop in the year, cost of production and wholesale price of the various crops grown in Ghana.

Ghana Cocoa Boars (COCOBOD) provides data on major season and minor season output of cocoa production based on cocoa purchased during the seasons and the annual purchasing price of cocoa as announced in the crop year.

2.4.3 Methodology

The indicator for crops is the sum of the monthly production of all crops in Ghana. This is a volume-based indicator measures in tonnes.

To obtain monthly output of crops, the crop budget supplied by SRID is used to derive monthly ratios, which in turn are used to determine the output of each crop in each month of the year using the annual production estimate. We calculate this by multiplying the monthly ratio, which serves as a proxy for the share of output attributed to that month, by the annual estimate of output. Hence, we arrive at monthly

estimates of output which sum to the total annual estimate. The ratios are determined based on the total input cost of producing a particular crop each month after adjusting for rent of land which is a non-produced asset. This is done for all the crops including cocoa.

2.5 Livestock

Livestock is not included in the MIEG as the compilation of livestock in the QNA depends on a livestock model. The livestock model parameters cannot be adjusted to produce monthly output. In future improvements to the MIEG we hope to include livestock. The exclusion of livestock should not harm the overall reliability of the MIEG growth rate as this sector accounts for less than 10 percent of agriculture GDP.

2.6 Forestry and Logging

2.6.1 Scope and coverage

The activities covered under forestry include timber tracts; planting, replanting and conservation of forests; gathering of uncultivated materials, such as gum and resins, wild rubber, saps, barks, herbs, wild fruits, and flowers, leaves, reeds, needles, firewood cutting and charcoal burning carried out in the forests.

Logging comprises: the felling and rough cutting of trees; hewing or rough shaping of poles, blocks, bolts and other wood materials; and transportation of logs up to permanent lines of transportation from where these can be transported by rail or road.

2.6.2 Data sources

The Forestry Commission of the Ministry of Lands and Natural Resources is the principal source of forest statistics in Ghana. We collect monthly data from the Forestry Commission covering three activities:

1. Volume in cubic meters of wood products for export;
2. Volume in cubic meters of logs processed into wood products for export; and
3. Volume in cubic meters of logs processed into wood products for the domestic market

2.6.3 Methodology

The MIEG indicator for forestry and logging is the total volume in cubic metres of logs and wood products produced for the domestic and export market. This is computed

using the monthly data received from the Forestry Commission. No deflation is required as the data is provided in cubic meters.

2.4 Fishing and Aquaculture

2.4.1 Scope and coverage

Natural stocks of fish with an economic value are assets and the same considerations apply to them as to other natural resources. Fishing is commonly used to describe the various activities involved in the harvest of aquatic resources. The scope of the fishing sub sector includes:

1. Marine fishing: commercial fishing in ocean, coastal and offshore waters;
2. Freshwater or inland fishing: catching, taking and gathering of freshwater fish from rivers, lakes, dams, ponds etc.; and
3. Aquaculture.

2.4.2 Source of data

The principal source of information is the Fisheries Commission. The Fisheries Commission provide us with monthly fish catch data which covers the following areas:

1. Marine Fishing (Artisanal)
2. Marine Fishing (Inshore)
3. Marine Fishing (Tuna)
4. Marine Fishing (Industrial)
5. Inland fishing
6. Aquaculture

2.4.3 Methodology

The fish catch data are provided in metric tonnes. We combine the data to arrive at a total fish catch estimate in metric tonnes for each month. This is the indicator used for the MIEG. Since the data is in volume terms it's not necessary to apply a deflator.

2.5 Mining and Quarrying

2.5.1 Scope and coverage

The mining and quarrying sub sector includes the extraction of minerals that occur in nature as solids, liquids or gases. It covers underground and surface mines and quarries

with all supplemental operations for dressing and the beneficiation of ores and other crude minerals such as breaking, milling, washing, cleaning, grading, etc and other preparations needed to render the material marketable by the establishment. All these activities are covered to the extent that they are carried out at the mine site or up to the first point of sale. Salt production by solar evaporation of sea water is considered under the mining sector. Large expenditures on preparing mining sites, prospecting and drilling activities are not included here as they are included under the 'construction' sector.

Extraction and production of hydrocarbons; crude petroleum and natural gas includes the extraction and production of bituminous or oil shale and tar sand to obtain crude oils; and extraction of condensate by draining and separation of liquid hydrocarbon fractions, gas desulphurization and mining of hydrocarbon liquids.

The sub sector is divided into the following components:

1. Minerals: gold, diamonds, bauxite and manganese;
2. Quarrying and salt mining;
3. Crude oil and gas production.
4. Mining support services (core ore, crude and gas)

2.5.2 Source of data

The principal source of information is the Minerals Commission and the Ghana National Petroleum Corporation (GNPC).

The Minerals Commission provides monthly production estimates for gold, diamond, manganese, and bauxite. The GNPC provides monthly data on the production of crude oil in barrels and gas in million standard cubic feet. We collect monthly VAT business turnover from the Ghana Revenue Authority (GRA) to compile monthly estimates on growth in output of Quarrying and salt mining and Mining Support Services.

2.5.3 Methodology

The data from the Minerals Commission and GNPC is compiled into separate GVA indicators for gold, diamond, manganese, bauxite, crude oil, and gas. This is completed by multiplying the monthly output by the base year price of the product to find a monthly GVO estimate in constant US dollar prices. Secondly, an intermediate cost ratio is applied and the process outlined in Equation 1 is followed to find a monthly estimate of GVA in constant US dollars. These GVA indicators are summed together into a mining and quarrying indicator which is used for the MIEG indicator for this sector.

The GRA data for quarrying and mining support services is currently not used in the compilation of the MIEG for mining and quarrying. We do not include these activities because the monthly minerals and oil and gas data account for 93 percent of the sector and achieve 97.7 percent correlation with the QNA.

2.6 Manufacturing

2.6.1 Scope and coverage

Manufacturing is defined as the mechanical or chemical transformation of inorganic or organic substance into new products, whether the work is performed by power-driven machines or by hand, whether it is done in a factory or in the workers' home, and whether the products are sold through wholesale or retail outlets. The economic activity relating to assembly of components and repair work as well as the installation of machinery is also included under manufacturing. Manufacturing is captured under the Major Division C of ISIC Rev 4 and in Ghana it includes the following activities:

1. Manufacture of food products
2. Manufacture of beverages
3. Manufacture of textiles
4. Manufacture of wearing apparel
5. Manufacture of leather and related products
6. Manufacture of wood, except furniture
7. Manufacture of paper and paper products
8. Printing and reproduction of recorded media
9. Manufacture of coke and refined petroleum products
10. Manufacture of chemicals and chemical products
11. Manufacture of basic pharmaceutical products
12. Manufacture of rubber and plastic products
13. Manufacture of other non-metallic mineral products
14. Manufacture of basic metals
15. Manufacture of fabricated metal products, except machinery and equipment
16. Manufacture of computer, electronic and optical products
17. Manufacture of electrical equipment
18. Manufacture of machinery and equipment n.e.c.
19. Manufacture of motor vehicles, trailers and semi-trailers
20. Manufacture of other transport equipment
21. Manufacture of furniture
22. Other manufacturing
23. Repair and installation of machinery and equipment

2.6.2 Source of data

The principal source of information is the Ghana Revenue Authority (GRA). The GRA provides monthly VAT business turnover for all the registered VAT paying firms in Ghana. Activity specific producer price indices (PPI) are provided by the GSS prices unit. Intermediate cost ratios are obtained from the 2013 base year Integrated Business Establishment Survey (IBES II).

2.6.3 Methodology

The business return data from the GRA is processed using the data cleaning methodology described in detail in chapter four. This is called data pruning. It treats gaps and in the VAT data to produce consistent, reliable, and accurate estimates for the monthly growth in business turnover by activity. This allows us to obtain a business turnover series for each of the manufacturing activities measured in current Ghana Cedis.

To find the growth in volume terms we deflate the business turnover using an appropriate PPI deflator. The deflators we use for each activity are in included in Table 1 below.

TABLE 1: MANUFACTURING DEFLATORS

Activity No.	ISIC Division	ISIC Division Label	Deflator
1.	10	Manufacture of food products	Food PPI
2.	11	Manufacture of beverages	Beverage PPI
2.	13	Manufacture of textiles	Textile PPI
4.	14	Manufacture of wearing apparel	Textile PPI
5.	15	Manufacture of leather and related products	Leather PPI
6.	16	Manufacture of wood and of products of wood and cork, except furniture;	Wood PPI
7.	17	Manufacture of paper and paper products	Paper PPI
8.	18	Printing and reproduction of recorded media	Print and Rec. Media PPI
9.	19	Manufacture of coke and refined petroleum products	Coke and Petro. PPI
10.	20	Manufacture of chemicals and chemical products	Chemicals PPI
11.	21	Manufacture of pharmaceuticals, medicinal chemical and botanical products	Basic Chemicals PPI
12.	22	Manufacture of rubber and plastics products	Rubber PPI
12.	23	Manufacture of other non-metallic mineral products	Non-metallic minerals PPI
14.	24	Manufacture of basic metals	Basic Metals PPI
15.	25	Manufacture of fabricated metal products, except machinery and equipment	Fabricated Metal Products PPI
16.	26	Manufacture of computer, electronic and optical products	Fabricated Metal Products PPI
17.	27	Manufacture of electrical equipment	Electric equipment PPI
18.	28	Manufacture of machinery and equipment N.E.C.	Machinery and Equipment PPI
19.	29	Manufacture of motor vehicles, trailers and semi-trailers	Total PPI
20.	30	Manufacture of other transport equipment	Total PPI
21.	31	Manufacture of furniture	Total PPI
22.	32	Other manufacturing	Total PPI
22.	33	Repair and installation of machinery and equipment	Total PPI

The deflated business turnover is used to calculate monthly constant GVA by subtracting intermediate cost (IC). The ICs are computed by multiplying the monthly business turnover by the relevant IC ratio obtained using the 2013 IBES II survey (see equation 1 at the beginning of this chapter). The monthly GVA series are then summed together to find a total manufacturing GVA in constant prices. This series is used as the indicator for manufacturing in the MIEG compilation.

2.7 Electricity, Gas, Steam and Air Conditioning Supply

2.7.1 Scope and coverage

This sub sector includes the activity of providing electric power, natural gas, steam, hot water and the like through a permanent infrastructure (network) of lines, mains and pipes. The dimension of the network is not decisive. Also included are the distribution of electricity, gas, steam, hot water and the like in industrial parks or residential buildings.

The activities covered in this sub sector are those that take place in the Ghanaian economy, including electric power generation, transmission and distribution.

2.7.2 Source of data

There are four (4) main sources of data for this sub sector.

1. Volta River Authority (VRA): Akosombo Hydro, Kpong Hydro, Takoradi Thermal, Takoradi International Company, Tema Thermal Plant, Siemens Power Plant, and Takoradi Extension (T3).
2. Independent power generators. These are Sunon Asogli, Bui Power Plant, and Cenit Power Plant.
3. The Grid Company of Ghana, GRiDCo: Data on transmission of electric power

The Electricity Company of Ghana (ECG) and Northern Electricity Distribution Company (NEDCO) provides data on distribution of electricity to households, industrial and commercial users.

2.7.3 Methodology

The MIEG indicator for Electricity, Gas, Steam and Air Conditioning Supply is compiled using data from the VRA on the monthly volume of electricity produced in KWh. The other sources of data are used in the QNA but are not covered in the MIEG. The monthly volume of electricity produced from the VRA is a key indicator for the QNA in this sector and therefore the MIEG growth aligns closely with the QNA growth without an indicator which covers the other activities.

2.8 Water Supply, Waste and Sewerage Management and Remediation Activities

2.8.1 Scope and coverage

The activities in the scope of this sub sector are water collection treatment and supply, sewerage, waste collection treatment and disposal activity, material recovery, remediation activities and other waste management services.

i. Water collection, treatment and supply.

This includes the following:

1. Collection of water from rivers, lakes, wells etc.
2. Collection of rainwater
3. Purification of water for water supply purposes
4. Treatment of water for industrial and other purposes
5. Desalting of sea or ground water to produce water as the principal product of interest
6. Distribution of water through mains, by trucks or other means
7. Operation of irrigation canals

ii. Sewerage

This includes the following:

1. Operation of sewer systems or sewer treatment facilities
2. Collecting and transporting human or industrial wastewater from one or several users, as well as rainwater by means of sewerage networks, collectors, tanks and other means of transport (sewage vehicles etc.)
3. Emptying and cleaning of cesspools and septic tanks, sinks and pits from sewerage, servicing chemical toilets
4. Treatment of wastewater (including human and industrial wastewater, water from swimming pools etc.) by means of physical, chemical and biological processes like dilution, screening, filtering, sedimentation etc.
5. Maintenance and cleaning of sewers and drains, including sewer rodding

iii. Waste Management

The coverage of activities under Waste Management are as follows:

1. Collection, treatment, and disposal of waste materials
2. Local hauling of waste materials and the operation of materials recovery facilities (i.e., those that sort recoverable materials from a waste stream).

2.8.2 Data sources

The principal data source for water activity is Ghana Water Company Limited (GWCL). The company provides data on the quantity of water produced and supplied in millions of cubic metres, and average price per cubic metres. The data is provided in volumes so no additional data is required for deflation.

2.8.3 Methodology

The MIEG indicator for Water Supply, Waste and Sewerage Management and Remediation Activities is a single indicator of the volume of water produced supplied by GWC. Growth in this indicator is the principal driver of GVA growth in the QNA for this sub-sector and therefore is a suitable and reliable indicator to use for the MIEG compilation.

2.9 Construction

2.9.1 Scope and coverage

The construction sector includes general construction and specialized construction activities for buildings and civil engineering works. It includes new work, repair, additions and alterations, the erection of prefabricated buildings or structures on the site and construction of a temporary nature. This work can be conducted on an own account or on a fee or contract basis. Portions of the work and sometimes even the whole practical work can be subcontracted out.

The activities of the construction sub sector are:

1. Construction of buildings;
2. Civil engineering (roads, railways, water and electricity mains, harbours, airports, dams, drainage, hydro-electric plants);
3. Specialized construction activities (demolition, site preparation, electrical, plumbing and other construction installation activities);
4. All own-account construction activities by households and firms.

2.9.2 Data sources

The primary sources of data for the construction sub-sector are the volume of cement production from the three largest cement producers in Ghana: Ghacem, Greenview, and Dagonte. We also compile business turnover data from the VAT records supplied by the GRA for the cement producing companies. This provides an additional source of information on the growth of the cement producing companies which we use in the absence of timely cement production data.

2.9.3 Methodology

The MIEG for construction follows the same methodology as the QNA for construction. We combine domestic cement production from the three biggest firms to compute an indicator for construction for each month. The monthly indicator of cement production is used as the indicator for the MIEG. If we do not receive monthly data in time for the release of the MIEG, we rely on the growth rate of the VAT returns of cement producing firms as the indicator. Once cement data becomes available, we revise the MIEG following our revision policy process.

2.10 Wholesale and Retail Trade

2.10.1 Scope and coverage

The sub sector wholesale and retail trade covers resale (sale without transformation) of new and used goods to retailers, industrial, commercial, institutional or professional users, or to other wholesalers, as well as the selling of merchandise to institutions and the general public for consumption.

This sub sector covers the following divisions:

1. Wholesale and retail trade and repair of motor vehicles and motorcycles (WRTRM);
2. Wholesale trade, except of motor vehicles and motorcycles (WT);
3. Retail trade, except of motor vehicles and motorcycles (RT);
4. Retail sale of automotive fuel in specialized stores (RSF).

5.10.2 Data sources

Business turnover from VAT records received from the GRA are the primary source of data used in compiling the MIEG for wholesale and retail trade. To compute volume growth in constant prices we use CPI and exchange rate deflators, from the GSS prices unit and Bank of Ghana (BoG), respectively.

2.10.3 Methodology

Business turnover data are first cleaned using the VAT pruning methodology described in Chapter 4. This process removes outliers and produces a growth index for each division which is applied to the VAT returns. The resulting series are then deflated using the appropriate deflators, as outlined in Table 2.

Next, monthly GVA is computed for each division. Business turnover serves as a proxy for GVO, from which intermediate consumption (IC) is subtracted. IC is derived by applying the 2013 base year IC ratios to the business turnover. The resulting estimates

of monthly GVA for each division are then aggregated to produce an overall volume index for Wholesale and Retail Trade.

TABLE 2: WHOLESALE AND RETAIL TRADE DEFLATORS

Activity No.	ISIC Division	ISIC Division Label	Deflator
1.	45	Wholesale and retail trade and repair of motor vehicles and motorcycles	CPI Transport
2.	46	Wholesale trade, except of motor vehicles and motorcycles	CPI Goods
2.	4730	Retail Sale of Fuel	Exchange Rate Deflator
4.	47	Retail trade, except of motor vehicles and motorcycles (excl retail sale of fuel)	CPI Goods

2.11 Accommodation and Food Services

5.11.1 Scope and coverage

This sub-sector includes the provision of short-stay accommodation for visitors and other travellers and the provision of complete meals and drinks fit for immediate consumption. The amount and type of supplementary services provided within this section can vary widely. The sector excludes the provision of long-term accommodation as primary residences, which is classified as real estate activities.

This sub sector comprises accommodation and food services. Accommodation services include:

1. Short term accommodation activities
2. Camping grounds, recreational vehicle parks and trailer parks
3. Other accommodation

Food and beverage services include:

4. Food and beverage service activities
5. Restaurants and mobile food activities
6. Events catering and other food service activities
7. Beverage serving activities

5.11.2 Data sources

Business turnover from VAT records received from the GRA are the primary source of data used in compiling the MIEG for Accommodation and Food Service Activities. To compute volume growth in constant prices we use monthly CPI for Hotels Café and Restaurants.

Activity No.	ISIC Division	ISIC Division Label	Deflator
1.	55	Accommodation	CPI Hotels Café and Restaurants
2.	56	Food and beverage service activities	CPI Hotels Café and Restaurants

2.11.3 Methodology

The business turnover data are cleaned using our VAT pruning methodology explained in chapter four. This deals with gaps and outliers in the source data to produce a growth index for each division. The IC ratios in the 2013 base year are the same for both accommodation and food services divisions. Therefore, we can combine the business turnover estimate to compute an aggregate MIEG indicator for the Accommodation and Food Services sector

2.12 Transport and Storage

2.12.1 Scope and coverage

This sub-sector is categorized under ISIC section H – Transportation and Storage. The sub sector includes the provision of passenger or freight transport, whether scheduled or not, by road, water or air and associated activities such as terminal and parking facilities, cargo handling, storage etc.

For the compilation of the MIEG, the sub sector is further divided into the following divisions:

1. Land transport
2. Water transport
3. Air transport
4. Warehousing and support activities for transportation
5. Postal and courier activities

2.12.2 Data sources

Business turnover from VAT records received from the GRA are the primary source of data used in compiling the MIEG for Wholesale and Retail Trade. To compute volume growth in constant prices we use CPI for Transport.

2.12.3 Methodology

Business turnover data are first cleaned using the VAT pruning methodology outlined in Chapter Four, which removes outliers and produces a growth index for each division. The divisions are then deflated using the Consumer Price Index (CPI) for transport.

Monthly GVA is calculated by treating business turnover as a proxy for GVO and subtracting intermediate consumption (IC). IC is derived by applying the 2013 base year IC ratios to the turnover data. The resulting GVA estimates for each division are then aggregated to construct an overall volume index for Transport and Storage.

2.13 Information and Communication

2.13.1 Scope and coverage

This sub-sector includes the production and distribution of information and cultural products; and the provision of the means to transmit or distribute these products; as well as data or communications, information technology activities and the processing of data and other information service activities.

The sub sector is divided into information activities and telecommunications activities, including:

Information activities include:

1. Publishing activities including software publishing;
2. Motion picture and sound recording activities;
3. Information technology activities; and
4. Other information service activities

Telecommunication activities include:

5. The services provided by telecommunication enterprises;
6. Radio and TV broadcasting and programming activities.

2.13.2 Data sources

The primary source of data for the telecommunications component of this sub-sector comes from the National Communications Authority (NCA). We collect monthly data on Mega Byte (Mb) usage from the NCA to compile a monthly volume indicator for communications.

We use business turnover from VAT records received from the GRA as the primary source of data for the Information component of this sub-sector. We use CPI collected from the GSS prices unit for deflation.

2.13.3 Methodology

The MIEG indicator for information and communication is the volume series collected from the NCA on megabyte (Mb) usage. This indicator is highly correlated with the quarterly GVA growth of this sub-sector and therefore we can use it as a single indicator for the sub-sector. However, in recent years the Mb usage has grown rapidly, which has reduced the reliability of this indicator. Hence, in months where the year-on-year growth rate of Mb usage is not reliable we use the growth in the business turnover derived from the VAT returns of telecommunications firms as an alternative indicator for this sub-sector.

2.14 Finance and Insurance

2.14.1 Scope and coverage

This sub sector includes financial service activities, insurance, reinsurance and pension funding activities and activities to support financial services. The sub sector is categorized under ISIC rev.4, section K - Monetary Intermediation, division 64 financial service activities, except insurance and pension funding. The sub sector includes financial service activities of obtaining and redistributing funds other than for the purpose of insurance or pension funding. These institutional units are all corporations and quasi corporations which are principally engaged in: Monetary intermediation (ISIC rev.4, Division 64) and; Insurance companies and pension funds (ISIC rev.4, Division 65).

The sub-sector includes the following financial intermediaries.

1. Central Bank of Ghana
2. Universal Banks
3. Savings and Loans Companies
4. Rural and Community Banks
5. Finance House

2.14.2 Data sources

We collect data from the Bank of Ghana (BoG) on the stock of loans and deposits held in Ghana. We download the data monthly from the BoG data portal (Bank of Ghana Database Portal). Under the heading 'Monetary Sector' we use the sum of 'Commercial Bank Assets: claims on the private sector' and 'Commercial Bank Assets: Claims on Government' as an indicator for universal banks stock of loans. We use the sum of 'Commercial Bank Liabilities: Private Sector Deposits' and 'Commercial Bank Liabilities: Government deposits' as an indicator for the stock of deposits.

To find volume growth we use the monthly CPI deflator sourced from the GSS prices unit to deflate the stock of loans and deposits.

2.14.3 Methodology

The series downloaded from the BoG data portal are combined and deflated to produce an indicator for the sub-sector. While the coverage of these data is less comprehensive than that of the QNA, the resulting volume growth indicator closely tracks growth in the more detailed QNA. This makes it a reliable and timely measure of sub-sector performance.

By simplifying data requirements, the MIEG balance's reliability with timeliness, ensuring that compilation remains efficient without compromising accuracy. As a result, the MIEG serves as a robust early estimate of quarterly GDP. However, we aim to improve the methodology this sector to more closely align with the QNA.

2.15 Real Estate

2.15.1 Scope and coverage

This sub-sector includes activities such as acting as lessors, agents, and/or brokers in one or more of the following: selling or buying real estate, renting real estate, providing other real estate services such as appraising real estate, or acting as real estate escrow agents.

Activities in this section are as follows:

1. The sub-sector covers real estate activities and imputed rent.
2. The real estate activities include the following: Buying, selling, renting and operating of self-owned or leased real estate, such as apartment buildings and dwellings, non-residential buildings, including exhibition halls, self-storage facilities, malls and shopping centers and land.
3. Provision of homes and furnished or unfurnished flats or apartments for more permanent use, typically on a monthly or annual basis. This includes development of building projects for own operation, i.e. for renting space in these buildings, subdividing real estate into lots, without land improvement operation of residential mobile home sites
4. The provision of real estate service activities on a fee or contract basis including activities of real estate agents and brokers; intermediation in buying, selling and renting of real estate on a fee or contract basis; management of real estate on a fee or contract basis; appraisal services for real estate, and activities of real estate escrow agents.

2.15.2 Data sources

High frequency data on real estate activity is not readily available. Therefore, we use population growth as a proxy for real estate growth as the growth in population indirectly determines the amount real estate activity due to demand for new homes and rental units.

2.15.3 Methodology

We use the population census with plausible assumption of 5 percent population growth per year.

2.16 Professional, Administrative, and Support Service Activities

5.16.1 Scope and coverage

This sub-sector is a combination of professional, scientific, technical, administration and support services activities. Specialised professional, scientific, and technical activities require a high degree of training. On the other hand, the administration and support service activities include a variety of activities that support general business operations. These activities differ from those in professional, scientific, and technical activities since their primary purpose is not the transfer of specialised knowledge.

This sub-sector comprises:

1. Legal and accounting activities;
2. Activities of head offices; management consultancy activities;
3. Architectural and engineering activities; technical testing and analysis;
4. Scientific research and development;
5. Advertising and market research;
6. Other professional, scientific, and technical activities;
7. Rental and leasing activities;
8. Employment activities;
9. Travel agency, tour operator, reservation service and related activities;
10. Security and investigation activities;
11. Services to buildings and landscape activities;
12. Office administrative, office support and other business support activities.

2.16.2 Data sources

Business turnover from VAT records received from the GRA are the primary source of data used in compiling the MIEG for Professional, Administrative, and Support Service Activities. To compute volume growth in constant prices we use monthly CPI deflators from the GSS prices unit.

2.16.3 Methodology

The business turnover data are cleaned using our VAT pruning methodology explained in chapter four. This removes outliers from the data to produce a growth index for each division. The growth index is applied to the January 2023 reference year to growth the series. The series are deflated using the Non-food CPI deflators collected from the GSS prices unit. Finally, the component business turnover estimates for each division are summed together to find an overall volume index for the sub-sector. The IC ratios re the same for all activities in this sector so it is not necessary to compute monthly GVA by activity.

2.17 Public Administration and Defence; Education; and Health

2.17.1 Scope and coverage

This sub-sector covers the activities of government carried out through public administration. These include the administration of programmes, legislative functions, taxation, national defence, public order and safety, immigration services, foreign affairs, and the delivery of compulsory social security.

Government units typically engage in non-market production, either to address market failures or as a matter of deliberate economic and social policy. Such output is recorded at the time of production, which, in the case of non-market services, is also the time of delivery.

Unlike goods and services sold on the market, non-market services cannot generally be valued using market prices. There are no markets for collective services such as public administration and defence, and even for individual services such as non-market education or healthcare, suitable prices may not be available. While similar services are sometimes produced and sold on a market basis, important differences in type and quality mean that market prices cannot be reliably applied to value the non-market equivalents—particularly when provided in large quantities.

For these reasons, and to ensure consistency across all non-market services, government output is valued using the cost approach. This method calculates output as the sum of intermediate consumption and compensation of employees. The resulting non-market output is provided to households free of charge and financed through taxation and other government revenues.

5.9.2 Data sources

Payroll data collected from the Ministry of Finance (MoF) on the compensation of employees working in government institutions whose main activity is public administration, health services provision, and education service provision. We also

compile a monthly wage index from the data using the number of employees and the compensation of employees.

2.9.3 Methodology

We compile a monthly series for Public Administration, Education, and Health from the payroll data. We then apply the wage deflator to ensure that we capture volume changes in compensation of employees.

2.18 Other Service Activities

2.18.1 Scope and coverage

It also includes the activities of membership organisations; the repair of computers and personal and household goods and a variety of personal service activities not covered elsewhere in the classification.

1. Activities of membership organizations
2. Activities of business, employers and professional membership organizations
3. Activities of trade unions
4. Activities of other membership organizations
5. Repair of computers and personal and household goods:
6. Repair of computers and communication equipment
7. Repair of personal and household goods
8. Other personal service activities:
9. Washing and (dry-) cleaning of textile and fur products
10. Hairdressing and other beauty treatment
11. Funeral and related activities.
12. Other personal service activities n.e.c.

2.18.2 Data sources

Business turnover from VAT records received from the GRA are the primary source of data used in compiling the MIEG for Professional, Administrative, and Support Service Activities. To compute volume growth in constant prices we use monthly CPI deflators from the GSS prices unit.

2.18.3 Methodology

The business turnover data are cleaned using our VAT pruning methodology explained in chapter 4. This removes outliers from the data to produce a growth index for each division. The growth index is applied to the January 2023 reference year to growth the series. The series are deflated using Non-food CPI. Finally, the

component business turnover estimates for each division are summed together to find an overall volume index for the sub-sector.

2.19 Net Indirect Taxes

2.19.1 Scope and coverage

Net Indirect Taxes are the difference between indirect taxes and subsidies. They cover taxes on domestic goods, taxes on international trade and subsidies.

2.19.2 Data sources

We compute net indirect taxes using an assumption based on the indicator growth rates for the main economic activities.

2.19.3 Methodology

The indicator for Net Indirect Taxes is computed by taking the average indicator growth rare for Manufacturing, Wholesale and Retail Trade, Accommodation and Food, Transport and Storage, Information and Communication, Real Estate, Professional, Administrative, and Support Services, and Other Services.

3.0 Business Turnover Data (VAT) Processing Methodology

3.1 Introduction

One of the main data sources for compiling both the MIEG and the QNA is monthly business turnover from value-added tax (VAT) returns, received from the Ghana Revenue Authority (GRA). These records include a business identification number, an ISIC Rev.4 classification code, and reported turnover. The data are aggregated by ISIC Rev.4 divisions and used as growth indicators for activities and sub-sectors of the Ghanaian economy.

Sectors that rely on VAT data account for 36 percent of the economy, based on 2013 base year GVA weights. As a result, the cleaning and processing of VAT data are critical to the accurate compilation of the MIEG, the QNA, and the preliminary estimate of the ANA.

3.2 VAT Pruning Methodology

We apply an internationally recognised methodology developed by the IMF Real Sector Division specifically for compiling high-frequency indicators of economic activity using VAT data. This method, known as the *Matched Pairs Pruning Tool*, identifies businesses that report in two consecutive periods (e.g., January and February) and calculates growth by dividing the total reported turnover in the later period by the equivalent total for the same businesses in the earlier period. The method also removes outliers—either individual units or extreme sales values—to minimise volatility in the MIEG and quarterly GDP growth rates.

By applying this approach, we ensure that sectoral growth rates in the MIEG and QNA, which rely heavily on VAT data, are not distorted by missing returns or outlier values.

To illustrate how the methodology works, Table 3 presents an example of VAT business turnover data by enterprise (E) from January to July 2024. The raw data include both missing returns and extreme fluctuations. For instance, enterprise E10 reports a turnover of 48,398 in January 2024 but only 15,310 in February 2024, remaining constant at that lower level through July. Similarly, enterprise E8 records a jump from 19,604 in April 2024 to 84,378 in May 2024—a month-on-month growth rate of 330 percent.

To address large fluctuations between periods and gaps caused by missing returns, we apply a *matched pairs* approach. This involves identifying businesses that appear in two consecutive months and forming a matched pair. Only pairs with growth rates falling within a reasonable bound are retained. This ensures that missing returns are accounted for and extreme changes in turnover, which would otherwise be treated as outliers, are excluded from the calculation.

TABLE 3: EXAMPLE VAT DATA

Date	Jan-24	Feb-24	Mar-24	Apr-24	May-24	Jun-24	Jul-24
E1	8,022.6	8,098.8	8,983.7	8,882.2	9,298.3	9,284.0	10,361.8
E2	3,315.0	3,819.8	3,912.2	3,524.4	13,942.2	3,988.0	4,049.8
E3	-	7,883.3	8,442.5	-	8,640.8	9,310.8	21,773.6
E4	7,019.4	7,033.0	-	-	7,925.2	8,212.5	-
E5	4,355.2	4,341.1	4,797.6	4,808.7	4,867.7	4,954.3	5,370.9
E6	14,960.2	-	-	17,365.5	17,004.9	17,835.1	77,051.2
E7	22,659.4	23,843.1	24,342.1	25,488.7	27,159.3	28,470.2	28,729.2
E8	15,853.1	17,103.3	18,745.7	19,603.7	84,377.7	45,474.1	47,260.2
E9	6,331.1	5,803.1	6,286.0	6,113.5	6,719.0	6,490.1	6,835.7
E10	48,398.0	15,309.6	16,494.1	17,089.8	17,179.4	17,454.2	18,736.8
Total	130,914.1	93,235.1	92,003.9	102,876.5	197,114.4	151,473.3	220,169.1

TABLE 4: TIME SERIES INDEX ON DIRECT SUM AND ON PRUNED SUM

Date	Jan-24	Feb-24
E1	8,022.6	8,098.8
E2	3,315.0	3,819.8
E3		
E4	7,019.4	7,033.0
E5	4,355.2	4,341.1
E6		
E7	22,659.4	23,843.1
E8	15,853.1	17,103.3
E9	6,331.1	5,803.1
E10		
Total	67,555.9	70,042.2
Index (py)		103.7

Date	Feb-24	Mar-24
E1	8,098.8	8,983.7
E2	3,819.8	3,912.2
E3	7,883.3	8,442.5
E4		
E5	4,341.1	4,797.6
E6		
E7	23,843.1	24,342.1
E8	17,103.3	18,745.7
E9	5,803.1	6,286.0
E10	15,309.6	16,494.1
Total	86,202.1	92,003.9
Index (py)		106.7

Table 4 illustrates the creation of matched pairs of enterprises. Enterprises E3 and E6 are excluded due to missing returns in either January or February, while E10 is excluded because its return was identified as an outlier. The final row shows the sum of sales in January and February, from which a growth index is calculated to capture month-on-month growth using only the matched pairs. The same procedure is then applied to form matched pairs between February and March.

FIGURE 1: THE DIRECT SUM SERIES VS PRUNED SERIES

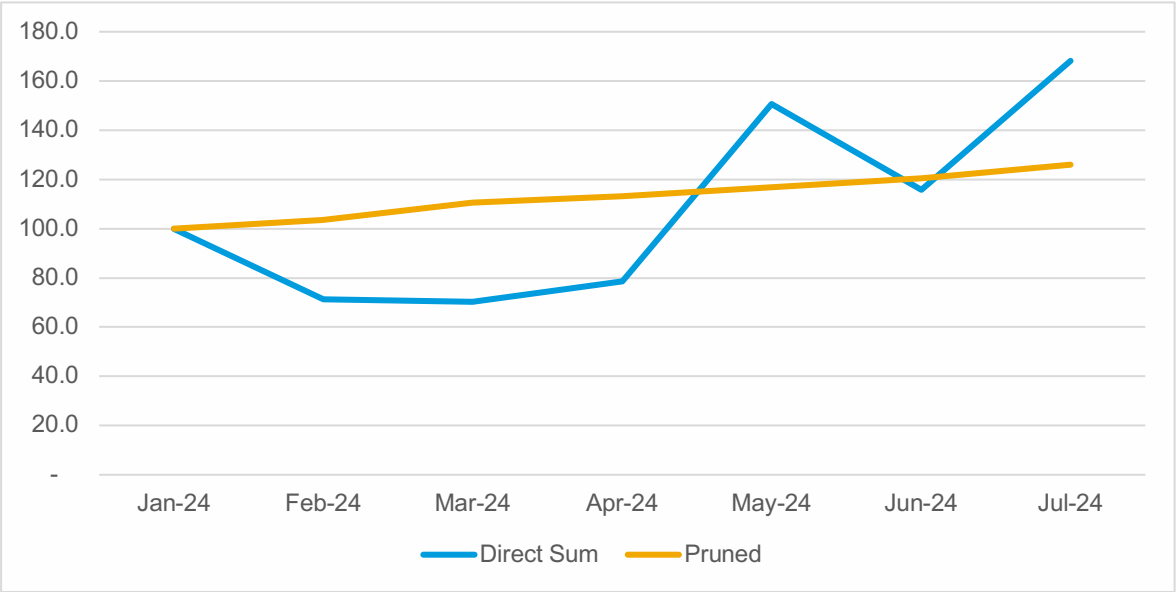


Figure 1 shows the results of using the pruned series against the direct sum series. If you directly sum the returns of all enterprises, you find that there are large movements in the series being caused by outliers and missing values. However, using the index growth calculated from matched pairs you find a smooth underlying trend in growth.

TABLE 5: PRUNED SERIES GROWTH

	Jan-24	Feb-24	Mar-24	Apr-24	May-24	Jun-24	Jul-24
Direct Sum	100.0	71.2	70.3	78.6	150.6	115.7	168.2
Month on Month	100.0	103.7	106.7	102.3	103.1	103.3	104.5
Pruned Chained index	100.0	103.7	110.7	113.2	116.8	120.6	126.0

Table 5 demonstrates how the reference year is fixed in January 2024 by summing all business turnover for that month. Using matched pairs, month-on-month growth rates are then calculated and applied to the pruned chained index. This produces a series that is more stable and better reflects the underlying pattern in the raw data.

The same methodology is applied to business turnover data from VAT returns at scale, using over 30,000 business records each month. The pruning method is applied separately to each ISIC Rev.4 division, based on the assumption that enterprises within a division operate in the same industry and under comparable market conditions. When assessing whether to exclude or retain enterprise pairs based on their month-on-month growth rates, we assess them against the distribution of growth rates within their division. Specifically, the median growth rate is used as the reference point.

Equation 2 presents the formula applied to determine the acceptable growth range for division *i* in month *t*. Here, *X* represents the lower-bound growth rate and *Y* the upper-bound growth rate. These bounds are defined by the median growth rate of division *i* in month *t*, the fixed parameter PTA (Pruning Tool Assumption), and the standard deviation of growth rates within division *i* in month *t*.

EQUATION 2: OUTLIER DETECTION FORMULA

$$Growth\ Range\ [X, Y]\ , where\ X = Median_{i,t} - PTA * SD_{i,t}\ and\ Y = Median_{i,t} + PTA * SD_{i,t}$$

Table 3 presents the PTA variables used to calculate the pruned series for each sector that relies on business turnover data. By design, pruning outliers and applying the matched pairs approach means that not all returns are used in calculating month-on-month growth indices..

The PTA variable is held constant to ensure consistency in pruning across periods. At the same time, we remain committed to reviewing these assumptions and working with the Ghana Revenue Authority to improve data quality, with the aim of incorporating a greater share of returns in the future. For now, the pruning tool provides the most effective means of producing a timely, reliable, and accurate indicator of changes in economic activity.

TABLE 6: PRUNING TOOL ASSUMPTIONS

Sector	Pruning Tool Assumption (PTA)
Wholesale and Retail Trade	0.247
Manufacturing	0.2
Transport and Storage	0.25
Accommodation and Food	0.5
Communication	0.5
Professional, Administrative and Support Service Activities	0.4
Other Services	0.13

4.0 Seasonal Adjustment

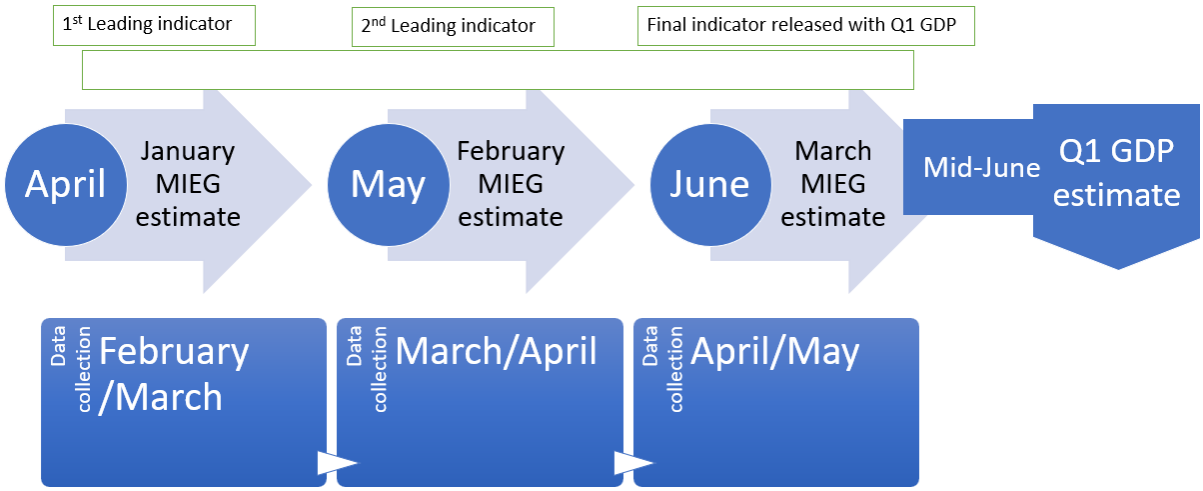
The current MIEG is presented in non-seasonally adjusted (NSA) series. As such only annual changes are calculated from the volumes index. The current NSA does not facilitate month on month growth rates. Monthly time series suffers from seasonal and trading day effects. Therefore, once the time series is long enough (at least five years) the GSS staff will start seasonal adjustment using JDemetra+.

5.0 Revision Policy

The MIEG will adopt the same revision policy as the Quarterly National Accounts (QNA) and Annual National Accounts (ANA), remaining open to revisions for up to two years. Revisions are a normal and necessary part of producing accurate and reliable statistics. Users should expect quarterly revisions to the MIEG as new data becomes available for the more comprehensive quarterly GDP releases. Again, each March, when the annual GDP estimate is published, both the quarterly and monthly figures that comprise the year are revised as part of the standard benchmarking procedure.

6.0 Publication timeline

FIGURE 2: MIEG RELEASE SCHEDULE Q1 EXAMPLE



The MIEG was developed to meet the growing demand for more timely macroeconomic statistics. *Timeliness* refers to the interval between the period a statistic measures and the date it is published. One of the key advantages of the MIEG is that it is released earlier than quarterly GDP estimates.

Currently, quarterly GDP figures are published with a 75-day lag after the end of the reference quarter. By contrast, the MIEG is released 75 days after the end of each reference month, significantly shortening the delay in accessing economic activity data within the quarter.[2] For example, while Q1 GDP is typically published in mid-June, MIEG data for January will be available by early April. By early May, users will already have access to two-thirds of Q1 growth information, providing earlier insights into emerging economic trends.

Figure 2 illustrates the release schedule for Q1. The initial MIEG, published in early April, presents year-on-year growth for January and three-month-on-three-month growth for November through January. The second release, in early May, incorporates February data and serves as a leading indicator of Q1 GDP. The final release, covering March, is published alongside the official Q1 GDP estimate and is treated as a benchmarked indicator, as it is fully aligned with the quarterly results.

[2] The initial release of the MIEG will lean towards 85 days, with improved iterations coming with less delay from the end of the reference month.

7.0 Acknowledgments

The GSS would like to acknowledge the contributions made by our data providers in adopting to the demands introduced by the development of this new statistic. We commend the efforts made by the Ministry of Agriculture, Forestry Commission, Fisheries Commission, Minerals Commission, Ghana National Petroleum Corporation, Ghana Revenue Authority, Bank of Ghana, National Communications Authority, Ghana Water Company, Volta River Authority, and the Ministry of Finance.

We also thank our international partners for providing technical assistance, specifically the national statistical authority of the UK (ONS), the International Monetary Fund (IMF), and the ODI Fellowship Scheme.

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Annex 1: MIEG Indicators

Broad Grouping	Sector	Sub-sector	MIEG Source	Indicator
Agriculture	Agriculture, Forestry and Fishing	Crops	Ministry of Agriculture	Output
		Livestock	Not included	
		Forestry	Forestry Commission	Output
		Fishing	Fisheries Commission	Output
Industry	Mining and Quarrying	Minerals (Gold, Diamond, Manganese, Bauxite)	Minerals Commission	Output
		Oil and Gas	Ghana National Petroleum Corporation (GNPC)	Output
		Quarrying	Not included	
		Mining Support Services	Not included	
	Manufacturing	-	Ghana Revenue Authority	GVA

	Electricity generation, transmission, and distribution	-	Volta River Authority	Output
	Water Supply, Sewerage and Waste	Water	Ghana Water Company	Output
		Sewerage	Not included	
	Construction	-	Cement Producers/Ghana Revenue Authority	Output
Services	Wholesale and Retail Trade; Repair of Vehicles	-	Ghana Revenue Authority	GVA
	Transportation and Storage	-	Ghana Revenue Authority	GVA
	Accommodation and Food Services	-	Ghana Revenue Authority	Output
	Information and Communication	Information	Not included	
		Communication	National Communications Authority/Ghana Revenue Authority	Output
	Finance and Insurance	Finance	Bank of Ghana	Output
		Insurance	Not included	

	Real Estate	**-**	**GSS Population Census**	**Output**
	Professional, Administrative, and Support Service Activities	**-**	**Ghana Revenue Authority**	**Output**
	Public Administration	**-**	**Ministry of Finance**	**Output**
	Education	**-**	**Ministry of Finance**	**Output**
	Health	**-**	**Ministry of Finance**	**Output**
	Other Services	**-**	**Ghana Revenue Authority**	**Output**


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