

ESTIMATION OF PRODUCTION



AGRICULTURE SECTOR

METHODOLOGY

Census data and Supply & Use Tables for year 2015 is incorporated in the estimation of output at the current prices. For the year where census data is unavailable, quantity of production and relevant prices information have been used. **Output** also includes estimation of fixed capital formation arising from:

- new plantings (for Rubber, Oil Palm and Other Agriculture);
- breeds (for Livestock); and
- planted logs but has not attained the maturity to be cut (for Forestry and Logging).

Estimation of **intermediate consumption** at constant prices are using the input-output ratio which is updated based on the latest data obtained.

Value added at current prices is obtained by inflating both output and intermediate consumption. For the year where census data is unavailable, estimates of production are based on the monthly production statistics.

DATA SOURCES

RUBBER

- Monthly Rubber Statistics, Malaysia
- Annual Rubber Statistics, Malaysia
- Malaysian Rubber Board
- Monthly External Trade Statistics

OIL PALM

- Malaysian Palm Oil Board
- Annual Report from the Main Oil Palm Plantation Companies
- Monthly External Trade Statistics

LIVESTOCK

- Department of Veterinary Services, Peninsular Malaysia
- Department of Veterinary Services, Sabah
- Department of Veterinary Services, Sarawak
- Monthly External Trade Statistics
- Ministry of Agriculture and Agro-Based Industry, Malaysia

OTHER AGRICULTURE

- Ministry of Plantation Industries and Commodities
- Ministry of Agriculture and Agro-Based Industry, Malaysia
- Malaysian Pineapple Industry Board
- National Kenaf and Tobacco Board, Malaysia
- Malaysia Pepper Board
- Federal Agriculture Marketing Authority

FORESTRY AND LOGGING

- *Department of Forestry, Peninsular Malaysia*
- *Department of Forestry, Sabah*
- *Department of Forestry, Sarawak*
- *Monthly External Trade Statistics*
- *National Timber Industry Policy (NATIP)*

FISHING

- *Department of Fisheries, Malaysia*
- *Monthly External Trade Statistics*



MINING AND QUARRYING SECTOR

METHODOLOGY

Output and intermediate consumption estimation at current prices is based on census/ annual surveys data. For the year where census/ annual surveys data is unavailable, the quantity of production and prices information of crude petroleum, condensate, natural gas and other mining have been used. For other mining & quarrying and support services activities, latest available census/ annual surveys data is being used to derive an input-output ratio.

Value added at constant prices is obtained by deflating both output and intermediate consumption. For the year where census/ annual surveys data is unavailable, estimates of other mining & quarrying production are used based on the production statistics from Minerals and Geoscience Department.

DATA SOURCES

PETROLEUM AND NATURAL GAS

- *Economic Census of Petroleum and Natural Gas*
- *SUT 2015*
- *Petroleum Nasional Berhad (PETRONAS)*
- *Annual Economic Statistics Mining of Petroleum and Natural Gas*

OTHER MINING & QUARRYING AND SUPPORTING SERVICES

- *Economic Census of Mining and Quarrying*
- *SUT 2015*
- *Annual Economic Statistics Mining of Petroleum and Natural Gas*
- *Quarterly National Accounts Survey*
- *Minerals and Geoscience Department*



MANUFACTURING SECTOR

METHODOLOGY

Output is realigned with the Supply & Use Tables for year 2015. Census/ annual surveys data are used in the estimation. The government accounts data provide information on taxes levied on the commodities of Manufacturing industries. This is to allow the estimates of output at producers' prices.

For the assembly of motor vehicles, electronics, fabricated metal and palm oil processing, adjustments have been made to output for assembling/ processing done on contract/ fee by others.

Estimation of **intermediate consumption** at constant prices are using the input-output ratio of census/ annual surveys. **Value added** at constant prices is obtained by deflating both output and input. For the year where census/ annual surveys data is unavailable, estimates of production are based on the value from Monthly Manufacturing Survey and Index of Industrial Production with the assumption that changes of input move at the same rate as the changes of output at constant prices.

DATA SOURCES

- Economic Census of Manufacturing
- SUT 2015
- Annual Economic Survey
- Index of Industrial Production
- Monthly Manufacturing Survey
- Monthly External Trade Statistics
- Accountant General's Department of Malaysia (JANM)



CONSTRUCTION SECTOR

METHODOLOGY

Output is realigned with the Supply & Use Tables for year 2010. The census/ annual surveys are used in the estimation of **output** for this sector. For the year where census/ annual surveys data is unavailable, Quarterly Construction Statistics data has been used in estimating output at current prices. In addition, secondary information on construction associated with the upstream activity of the oil and gas industry is also included. Estimation of **intermediate consumption** is using input-output ratio of latest available census/ annual surveys data.

Value added at constant prices is obtained by deflating both output and input. For the years where census/ annual surveys data are unavailable, estimation are based on Quarterly Construction Statistics with the assumption that changes of intermediate consumption move at the same rate as the changes of output at constant prices.

DATA SOURCES

- Economic Census of Construction
- SUT 2015
- Annual Economic Survey of Construction
- Quarterly Construction Statistics



SERVICES SECTOR

METHODOLOGY

A) PRIVATE SERVICES

Output for Private Services sector is estimated at current prices based on the census/ annual surveys, financial statement and administrative data from various agencies which applies to the following sub-sectors:

UTILITIES

For the year where census/ annual surveys data is unavailable, consumption data is used as a mover to estimate the annual output.

WHOLESALE & RETAIL TRADE

Census of Distributive Trade 2014, Wholesale & Retail Trade Census 2019 and estimation of Annual Economic Survey are used as a benchmark. For the years where census/ annual surveys data is unavailable, Monthly Survey of Distributive Trade data and Index of Distributive Trade are used as a mover to estimate the annual output.

FOOD & BEVERAGE, ACCOMMODATION, TRANSPORTATION & STORAGE, INFORMATION AND COMMUNICATION, REAL ESTATE, BUSINESS SERVICES, PRIVATE EDUCATION, PRIVATE HEALTH AND OTHER PRIVATE SERVICES

For the year where census/ annual surveys data is unavailable, Quarterly Survey of Services and Index of Services data are used as a mover to estimate the annual output.

FINANCE

Main output consists of explicit service charges and FISIM. FISIM is calculated based on reference rate method as recommended in 2008 SNA. Allocation of FISIM is made according to the composition of stock of loans and deposits in the banking system.

INSURANCE

Output at current prices is derived by adding premium income and net investment income minus claims paid.

OWNER OCCUPIED DWELLINGS

The number of owner occupied houses from Population and Housing Census and information on average rental by types of dwelling from Household Expenditure Survey are used as a benchmark to estimate output at constant prices. For the subsequent years, output at constant prices is extrapolated based on changes in housing stock which includes the increased proportion factor of home ownership population in Malaysia.

METHODOLOGY AND DATA SOURCES

NON-PROFIT INSTITUTION SERVING HOUSEHOLDS (NPISHs)

For the year where census/ annual surveys data is unavailable, total population data is used as a mover to estimate the annual output at constant prices.

DOMESTIC SERVICES TO HOUSEHOLDS

Total population data is used as a mover to estimate the annual output at constant prices.

Relevant price indices are used to deflate output to arrive at constant prices. Estimation of **intermediate consumption** at constant prices are using input-output ratio which is updated based on the latest data available. **Value added** is derived as residuals by subtracting intermediate consumption from output.

B) GOVERNMENT SERVICES

This industry is categorised as non-market producer, thus the value added is obtained from compensation of employees, pension allocated to the current employees and Consumption of Fixed Capital (COFC). Compilation is based on the data of Federal Government, State Government, Statutory Bodies and Local Authorities. Constant value added estimation has been elaborated in Government Final Consumption Expenditure.

DATA SOURCES

Data Sources	Sub-sectors														
	Utilities	Wholesale & retail trade	Food & beverage	Accommodation	Transportation & storage	Information & communication	Finance	Insurance	Real estate	Business services	Private education	Private health	Other services	Owner occupied dwellings	Non-profit institution serving households (NPISHs)
1 Economic Census	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
2 Supply & Use Tables 2015	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
3 Census of Distributive Trade		✓													
4 Annual Economic Statistics	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
5 Monthly Survey of Distributive Trade		✓													
6 Quarterly Survey of Services			✓	✓	✓	✓			✓	✓	✓	✓			
7 Population and Housing Census													✓	✓	✓
8 Household Income, Expenditure and Basic Amenities Survey													✓		
9 Labour Force Survey															✓
10 Central Bank of Malaysia							✓	✓							
11 Accountant General's Department of Malaysia (AGD)															✓
12 Financial statements of the State Government, Local Authorities and Statutory Bodies															✓
13 Public Services Department															✓
14 Retirement Fund Incorporated															✓
15 National Property Information Centre (NAPIC)									✓				✓		
16 Companies Financial Statements	✓						✓	✓							



IMPORT DUTIES

METHODOLOGY

The final value is obtained from the annual report of the Accountant General. For the recent year, monthly accounts which obtained from Royal Malaysian Customs Department has been used in the estimation.

The current prices import duties are deflated by the relevant prices to arrive import duties at constant prices.

DATA SOURCES

- *Accountant General's Department of Malaysia (AGD)*
- *Royal Malaysian Customs Department*

ESTIMATION OF EXPENDITURE



PRIVATE FINAL CONSUMPTION EXPENDITURE

METHODOLOGY

Private Final Consumption Expenditure consists of Household Final Consumption Expenditure and Final Consumption Expenditure of Non-Profit Institution Serving Households (NPISHs).

Household Final Consumption Expenditure is analysed according to the commodity and services group based on the Classification of Individual Consumption by Purposes (COICOP) which is divided into four categories: durable goods, non-durable goods, semi-durable goods and services.

To calculate the relevant services consumption expenditure, part of output at current and constant prices for the respective services is taken as a mover to obtain the consumption at current prices.

FISIM is also included in Household Final Consumption Expenditure estimation.

Household Income, Expenditure and Basic Amenities Survey has been used as a benchmark to derive annual expenditure estimate at current prices and distribution of expenditure by type of goods and services.

The expenditure at constant prices is obtained by deflating the estimates at current prices of each item using relevant price indices.

Final consumption expenditure of NPISHs is obtained by summing up intermediate consumption and compensation of employees and deducting receipts from sales.

Actual Final Consumption of Households

$$\begin{aligned} &= \text{Household final consumption expenditure} \\ &+ \text{Final consumption expenditure of NPISHs} \\ &+ \text{Individual consumption expenditure of general government} \\ &\quad (\text{health, education and social security and welfare}) \end{aligned}$$

DATA SOURCES

- Household Income, Expenditure and Basic Amenities Survey
- SUT 2015
- Economic Census
- Annual Economic Survey
- Quarterly Balance of Payments
- Monthly Survey of Distributive Trade
- Quarterly Survey of Services
- Monthly External Trade Statistics
- Central Bank of Malaysia
- Malaysia Tourism Promotion Board



GOVERNMENT FINAL CONSUMPTION EXPENDITURE

METHODOLOGY

Government Final Consumption Expenditure is equal to the output of government less value of sales plus FISIM. Output is equal to value added plus intermediate consumption.

The constant price estimates of value added is obtained by deflating salaries and wages with an index of Federal Government starting wage rate. In constructing the wages index, salary revisions and bonus payments have been treated as price increases while the annual civil service increment has been treated as an increase in productivity. Meanwhile, the constant price for intermediate consumption is obtained by deflating the intermediate consumption using relevant price indices. Consumption of Fixed Capital (COFC) at constant prices is derived using an integrated Perpetual Inventory Method (PIM) and the current price is estimated by inflating the COFC for the respective assets using appropriate price indices. This methodology is consistent with the recommendations by 2008 SNA.

Government Final Consumption Expenditure can be categorised into individual consumption of general government (also known as social transfers in kind) and collective consumption of general government.

Collective consumption of general government is part of government consumption expenditure acquired by the general government such as general public services, defence, public order and safety and economic affairs. These expenditures are provided by general government simultaneously to all members of the community or to all members of a particular sector of the community. There is no mechanism of redistributing such resources among individual household.

Individual consumption of general government is expenditures incurred by general government but actually acquired by households such as education, health, social protection.

DATA SOURCES

- Accountant General's Department of Malaysia (AGD)
- Financial statements of the State Government, Local Authorities and Statutory Bodies



GROSS FIXED CAPITAL FORMATION

METHODOLOGY

Estimation of Gross Fixed Capital Formation (GFCF) by type of assets is divided into three type of assets i.e. Structure, Machinery & Equipment and Other Assets. GFCF of structure is calculated based on the value of output from construction activities coupled with information of oil & gas investment. The costs of ownership transfer for structure are estimated and appended; to obtain the value at purchasers' prices.

GFCF of Machinery & Equipment are estimated by applying the SUT 2015 ratio on the output which was obtained from census/ annual surveys and imports of capital goods. For Other Assets, the estimation are based on Annual Economic Statistics Mining of Petroleum and Natural Gas, exploration expenditure of oil & natural gas and various data from government agencies.

METHODOLOGY AND DATA SOURCES

GFCF by sector is classified into Public and Private sectors. The value of Public GFCF is obtained from the Capital Expenditure for General Government Accounts and Survey of Capital Expenditure for Public Establishments. Meanwhile, the estimates of Private GFCF is derived from information of census/surveys on the private establishment and various related administrative data.

GFCF at constant prices is obtained by deflating the GFCF at current prices with the relevant price indices.

DATA SOURCES

- SUT 2015
- Economic Census
- Annual Economic Surveys
- Annual Economic Statistics Mining of Petroleum and Natural Gas
- Ministry of Agriculture & Agro-Based Industry and related agencies
- Quarterly Construction Statistics
- Monthly Manufacturing Survey
- Monthly External Trade Statistics
- Quarterly Balance of Payments
- National Film Development Corporation Malaysia (FINAS)
- Recording Industry Association of Malaysia (RIM)
- National Research and Development Survey, MASTIC
- National Property Information Centre (NAPIC)
- Financial Statement of Federal Government, State Government, Local Authorities and Statutory Bodies
- Survey of Capital Expenditure for Public Establishments
- Financial Statements from Companies



CHANGES IN INVENTORIES

METHODOLOGY

Changes in inventories is defined as the difference between additions to and withdrawals from inventories. In principle, it is derived by subtracting opening inventories from closing inventories.

Generally, inventories generate holding gains or losses as the market prices of the goods held in stock rise or fall. These gains or losses are not the result of production process and thus cannot contribute to GDP compilation.

Opening inventories at current prices need to be deflated by using prices at prevalent time of entry to arrive at constant prices. Then the opening inventories at constant prices are inflated by using prices ruling at the time of closing inventories to arrive at current prices. Subsequently, the subtraction of closing inventories against opening inventories will give the changes in inventories without holding gain or losses effect.

DATA SOURCES

- Monthly Manufacturing Survey
- Annual Rubber Statistics, Malaysia
- Monthly Survey of Distributive Trade
- Malaysian Palm Oil Board
- Department of Veterinary Services
- Federal Government Accounts



VALUABLES

METHODOLOGY

Valuables is defined as products bought for the purpose of investment where the purchase is made with the assumption that the value of the products will increase in the future. Examples of valuables are precious metals and stones, antiques, works of art and etc. Value at current prices is obtained from various indicators and data sources such as imports data, manufacturing survey and distributive trade. These data is then deflated by the relevant price indices to arrive the value at constant prices.

DATA SOURCES

- *Monthly Survey of Distributive Trade*
- *Monthly Manufacturing Survey*



EXPORTS AND IMPORTS

METHODOLOGY

Exports and Imports data consist of goods and services. Nevertheless, the value of exports and imports do not include borrowing and lending, interest and other transfers between Malaysians and the rest of the world.

Values on merchandise trade are compiled from the Customs Declarations processed by the Department while value of services is obtained from various sources including national carriers, Bank Negara Malaysia, Immigration Department and various surveys such as the Quarterly Survey of International Investment and Services, Survey of Foreign Airlines Companies in Malaysia and Census of Shipping Companies in Malaysia.

The merchandise trade records are adjusted for transactions that are not otherwise covered (e.g. exports of water) or which are not transacted between Malaysia and the rest of the world (e.g. goods in transit through Malaysia and goods received for repairs and re-export). Measures of travel receipts and payments are obtained from various sources including surveys carried out by the Tourist Development Corporation.

The value of exports and imports are recorded on a change of ownership principle which is the flow of goods between the country owning the goods and the country providing the processing services should not be recorded as imports and exports of goods.

DATA SOURCES

- *Monthly External Trade Statistics*
- *Quarterly Balance of Payments*
- *Central Bank of Malaysia*
- *Malaysia Tourism Promotion Board*
- *Immigration Department of Malaysia*



RECONCILIATION

The estimates of production and expenditure should be the same theoretically. However, this does not happen practically. Differences occur because the information used for GDP by Production and Expenditure approach comes from different sources and often there are gaps in the information available. Timing differences between information sources also contribute to the imbalance. The SUT 2015 identify transactions between industries and final demand in considerable detail. Working at this very detailed level within a matrix presentation allows the national accountants to bring the system into balance.

In this publication adjustments have been made to equate the supply and use of goods and services. This practice makes the best use of the information available and of the knowledge that the national accountants have of each item contributing to the GDP by Production and Expenditure approach.



FUTURE DEVELOPMENTS

The information which is provided in this publication describes the methods used to date. However, as new data sources or new methodology recommendations from SNA become available, the data will be incorporated in the compilation and further research will be made to improve the current methods. Hence, it is expected that the changes in data and methods will be made on a continuous basis. Such changes will be introduced so as to maintain the continuity of the time series.