

MEASURING GROSS DOMESTIC PRODUCT – USING INCOME APPROACH

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Abstract

This article elaborates on the fundamentals of developing the estimation of Gross Domestic Product (GDP) by income approach in Malaysia in accordance with the Malaysia Standard Industrial Classification 2000 (MSIC 2000) and the application of the income approach in economic analysis. This paper highlights the methodology, components of the income approach, scope and coverage, sources of data and the analysis that could be generated. The compilation of GDP using the income approach is to complement the production and expenditure approaches and seen as essential in providing a holistic picture of the economic performance of a country as well as in assisting policy makers.

Keywords: GDP by Income approach

Historical background

The Department of Statistics Malaysia (DOSM) has a long history in the compilation of GDP using the production and expenditure approaches. Prior to 1955, the estimation of GDP was undertaken by the Economic Advisor to the Commissioner-General led by Dr. Frederic Benham for the period 1947 to 1949. The compilation of GDP encompassed the Malayan Union/Federation of Malaya and Singapore. For the period 1949 to 1953, the International Bank of Reconstruction and Development did the compilation. Miss Dorothy Walters, the United Nations National Income Adviser to the Government of the former Federation of Malaya prepared estimates for the years 1955 to 1959 using the income approach.

The income approach realised by DOSM indirectly through the compilation of the “Distribution and Use of Income Accounts and Capital Account”² using the System of National Accounts 1993 (SNA 1993). It was done with the technical assistance from the United Nations Statistics Division (UNSD). This compilation is made independently based on the final data obtained from the economic surveys or censuses. Estimation of GDP by income approach is compiled by institutional sectors based on sequence of accounts in current prices. Similarly in the compilation of National Accounts for every benchmark base year, GDP by income approach is estimated by economic activity. In view of the demand of factors of income by economic activities, the income approach in the measurement of GDP is being developed to complement the production and expenditure approaches.

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² The income approach is derived from the Generation of Income Account. The Generation of Income Account is part of the sequence of accounts under the Distribution and Use of Income Accounts and Capital Account.

The latest and comprehensive data on GDP using the three approaches are sought after by DOSM's stakeholders for policy making purposes. This barometer of economy serves as an input for the implementation of short, medium and long term plans. The contribution of specific industries at detailed levels provides a holistic picture of the economy especially in ascertaining the performance by economic sectors.

In responding to stakeholders' needs, DOSM initiated the detailing of the estimation of GDP by income approach since 2007 by looking into various sources of available data. Besides using existing data sources, DOSM embarked on the efforts of data tapping as practiced by most developed countries. References were made by doing comparative studies of other countries which have successfully developed GDP by income approach.

Methodology

The three approaches on the estimation of GDP are the production approach³ GDP(P), expenditure approach⁴ GDP(E) and income approach GDP(I). The latter will be elaborated in the following segment. Utilizing all three approaches will enable GDP to be viewed from different perspectives as well as providing an avenue for cross validation.

The income approach

GDP(I) provides estimates of GDP by adding up the total income i.e. operating surplus and remuneration received by factors of production namely households and firms engaged in the process of production plus taxes less subsidies during a certain period, usually one year.

The formulae for GDP(I):

$$\begin{aligned} \text{GDP(I)} = & \\ & \text{Compensation of employees (CE)} \\ & + \text{Gross operating surplus (GOS) and Gross mixed income (GMI)} \\ & + \text{Taxes on production and imports} \\ & - \text{Subsidies on production and imports} \end{aligned}$$

Compensation of employees

Compensation of employees is defined as "*the total remuneration, in cash or in kind, payable by an enterprise to an employee in return for work done by the latter during the accounting period*" (SNA 1993, page 164). It is also seen as return to labour input.

³ A method of computing GDP by taking the value of good and services produced by an industry and deducting the cost of goods and services used up by the industry in the production process.

⁴ A method of computing GDP that measures the total amount spent on all final goods during a given period.

It is essential to clarify the nature of the employment relationship in order to fix the boundary between compensation of employees and other kind of receipts. This is so as compensation of employees excludes self-employed workers who are classified as receiving mixed income instead of receiving compensation of employees.

Components of compensation of employees

Wages and salaries is defined as *“Wages and salaries include the values of any social contributions, income taxes, etc., payable by the employee even if they are actually withheld by the employer for administrative convenience or other reasons and paid directly to social insurance schemes, tax authorities, etc., on behalf of the employee. Wages and salaries may be paid in various ways, including goods or services provided to employees as remuneration in kind instead of, or in addition to, remuneration in cash” (SNA 1993, page 166).*

Wages and salaries is one of the two main components of compensation of employees, which may be payable in cash or in kind. The other component of compensation of employees is the value of the social contribution payable by employers.

Wages and salaries in cash includes remuneration in the form of wages and salaries payable at regular weekly, monthly or other intervals, payment made to employees away from work for short period, supplementary allowance, bonuses and performance-based incentives, commission, gratuities and tips received by employees. Reimbursements by employers for expenses incurred by employees by enabling them to carry out their work and unfunded employee social benefits⁵ are excluded from wages and salaries in cash.

Employees can also be remunerated in kind. It consists of goods and services, or other benefits, which are provided by employers at reduced price or free of charge. Those goods and services, or other benefits, are not necessary for the employers' production process. For the employees, those wages and salaries in kind represent an additional income: they would have been paid at market price if they had bought these goods or services by themselves.

Employers' social contributions are payments made by the employers to safeguard the employees' entitlement to social benefits if certain events occur such as retirement, sickness, accidents, etc. Employers' social contributions can be actual or imputed such as EPF and SOCSO.

Employers' actual social contributions are those that the employers contribute directly to social security funds, insurance enterprises or other institutional units which manage or administer social insurance scheme. Employers' imputed social contributions are social benefits provided directly to the employees, former employees or dependents without going through an insurance enterprise or

⁵ Unfunded employee social benefits includes allowances in respect of dependents, payment to worker during absence from work due to illness, maternity leave etc (at full rate or in proportion of wages and salaries), severance payments to workers or their survivors who lose their jobs because of redundancy, incapacity, accidental death etc.

autonomous pension funds and without creating special funds or segregated reserve.

(a) Gross operating surplus and gross mixed income

The gross operating surplus is the operating surplus before deducting the consumption of fixed capital. Operating surplus is the income from production of corporate enterprises, while mixed income is the term used to denote the income from production of unincorporated enterprises⁶. Operating surplus and mixed income are measure of the surplus accruing from the processes of production before deducting any explicit or implicit interest charges, rent or other property income payable on the financial assets, land or other tangible non-produced assets to carry production.

(b) Taxes less subsidies on production and imports

Taxes on production and imports are compulsory, unrequited payments, in cash or in kind which are levied by the general government. These taxes are payable irrespective of the profits or loss incurred. Taxes on production and import consist of:

- (i) Taxes that are payable on goods and services when they are produced, delivered, sold, transferred or otherwise disposed off by their producers;
- (ii) Taxes and duties on imports payable when goods and services enter the economic territory or when services are delivered to residents by non-residents; and
- (iii) Other taxes on production such as tax on ownership or use of land, buildings, or other assets used in production, or on the labour employed, or labour cost.

Subsidies are unrequited payments made by the government units to enterprises, namely resident producers or importers on the basis of the levels of their production activities or the quantities or values of the goods or services which they produce, sell or import. Subsidies are paid to influence producers' level of output, the prices at which outputs are sold or the remuneration of the producers. As the impact of subsidies on producers' incomes is the opposite of taxes on production, subsidies can be considered as negative taxes. Subsidies are not payable to households and current government transfers to households are treated as social benefits and part of secondary income.

Scope and Coverage

The analytical framework and data compilation follows closely the structure, concepts, definitions and classification as set up in SNA 1993. Establishments⁷ are statistical units that provide input for the compilation of GDP and are classified

⁶ Unincorporated enterprises owned by members of household, either individually or in partnership with others, in which the owner or other members of their household, may work without receiving any wage or salary.

⁷ An establishment is defined as an economic unit which engages, under a single ownership or control, i.e. under a single legal entity, in one, or predominantly one, kind of economic activity at a single location.

according to the Malaysia Standard Industrial Classification 2000 (MSIC 2000), which conforms to the International Standard Industrial Classification (ISIC) Rev. 3.1. There are a total of 698 items from 60 divisions in MSIC 2000. In 2010, DOSM will implement MSIC 2008, based on ISIC Rev. 4 which covers a total of 1,174 items from 88 divisions.

The scope of data includes all activities within the SNA 1993 production boundary and all regions associated with Malaysia that include free trade zones set up in the country and off-shore financial for export promotion purposes.

Sources of data

The main sources of data for this compilation are the annual economic surveys/censuses which include the economic sectors of agriculture, mining and quarrying, manufacturing, construction and services together with data from the labour force and wages and salary surveys. Secondary data are tapped from other agencies, in particular the Ministry of Finance, the Central Bank and the Ministry of Agriculture & Agro-Based Industry.

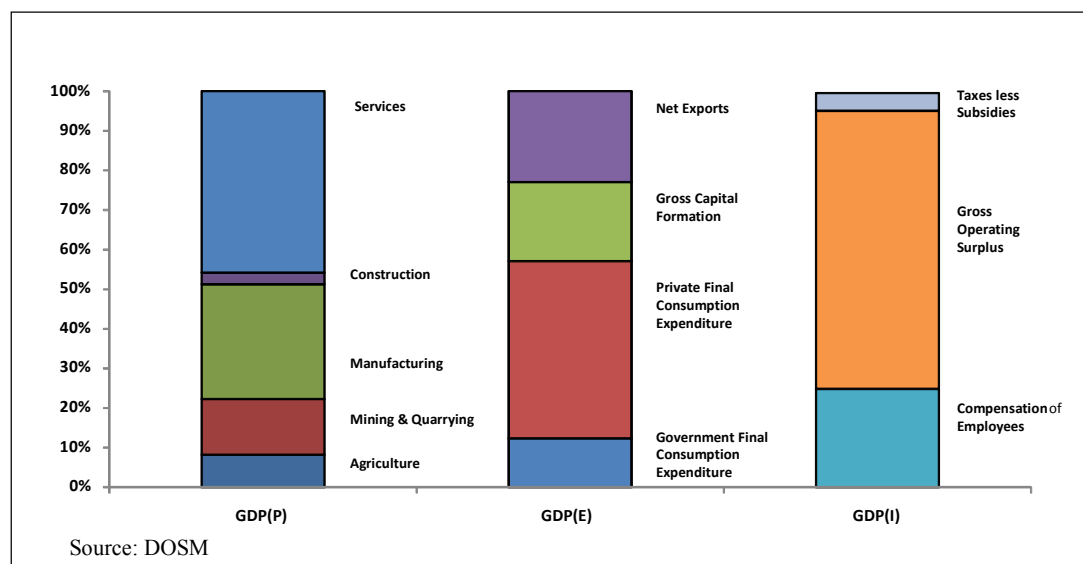
Analysis of income approach

The compilation of GDP by income approach enables the generation of various economic analysis, as described below. The analysis provided in this article is based on the preliminary GDP(I) data for the year 2005.

(a) Components of GDP

Chart 1 illustrates the components of GDP in Malaysia in current prices, according to the three approaches of GDP compilation.

Chart 1: Components of GDP by three approaches, Malaysia, 2005



The largest component of GDP(P) was services, followed by manufacturing. For GDP(E), private final consumption expenditure was the largest contributor followed by net exports. For GDP(I), gross operating surplus was the largest component with 67.1 per cent share followed by compensation of employees (28.0%) whereas taxes less subsidies (4.9%) accounted for the smallest share.

(b) Compensation of Employees

Table 1 shows the compensation of employees, gross operating surplus/mixed income and taxes less subsidies on production & import of selected countries. It is observed that the proportion of compensation of employees varies among countries. Generally, in advanced countries, the compensation of employees is the largest component in GDP(I). Japan and the United States accounted for 51.5 per cent and 56.9 per cent respectively as compared to Malaysia which only registered 28 per cent.

Table 1: Share of GDP(I) Component of Selected Countries 2005

Countries	Compensation of Employees %	Gross Operating Surplus/Gross Mixed Income %	Taxes less subsidies on production and imports %
Malaysia	28.0	67.1	4.9
Philippines*	27.8	64.0	8.2
Korea	45.8	43.0	11.2
Canada	50.6	38.1	11.3
Japan	51.5	40.4	7.7
United Kingdom	54.5	33.5	12.1
United States	56.9	36.6	7.0

Source: OECD Stats

* Refer to data for 2006

Table 2 shows the composition and share of the compensation of employees by sectors in Malaysia for the years 1991, 2000 and 2005 obtained from the compilation of National Accounts. Significant changes can be seen especially in the agriculture and services sectors. In year 1991, the agriculture sector contributed 15.9 per cent to the compensation of employees while the services sector contributed 48.4 per cent. In year 2000, the share of the agriculture sector declined to 4.9 per cent while the services sector further increased to 55.8 per cent. In year 2005, there was a slight change to this pattern where the share of agriculture sector increased to 5.5 per cent and services sector decreased to 53.4 per cent. Meanwhile, the share of the manufacturing sector increased from 28.6 percent in year 2000 to 31.4 per cent in year 2005. As such, the share of services sector remained the biggest, in line with the economic development in Malaysia where the services sector has become the main contributor to the economy.

Table 2: Compensation of employees by sectors, Malaysia

Sectors	RM Million			Share %		
	1991	2000	2005	1991	2000	2005
Agriculture	5,487	4,891	8,314	15.9	4.9	5.5
Mining & Quarrying	869	1,271	1,471	2.5	1.3	1.0
Manufacturing	9,019	28,353	47,446	26.1	28.6	31.4
Construction	2,417	9,266	13,190	7.0	9.3	8.7
Services	16,712	55,357	80,775	48.4	55.8	53.4
TOTAL	34,504	99,138	151,195	100.0	100.0	100.0

Source: DOSM

The largest contributor within the agriculture sector was the oil palm sub-sector (84.8%). This was parallel to the contribution of this sub-sector to value added. Three sub-sectors namely forestry and logging, rubber and poultry contributed 11.7 per cent to the overall value of compensation of employees in the agriculture sector.

The increase in crude oil price, especially in year 2005 contributed to the increase of output of the mining and quarrying sub-sector as compared to the year 2000. However, the share of this sector declined from 1.3 per cent in year 2000 to one per cent in year 2005.

The manufacturing sector which was the second largest contributor to value added recorded 31.4 per cent share in the compensation of employees in year 2005 as compared 28.6 per cent in year 2000. However, like other sectors, the value of compensation of employees for the manufacturing sector in year 2005 recorded an increase. Within the manufacturing sector, the electric and electronic sub-sector registered the highest payment of compensation of employees.

The services sector saw a slight decrease in share but increase in value in year 2005 as compared to year 2000. The business and private services and transport and communication sub-sectors collectively posted the largest share of 30.7 per cent of compensation of employees in year 2005.

(c) Gross operating surplus and gross mixed income

Table 3 shows gross operating surplus and gross mixed income by sectors for years 1991, 2000 and 2005. The contribution of the agriculture sector to gross operating surplus and gross mixed income decreased from 14.7 per cent in year 1991 to 10.4 per cent in year 2005. The share of the manufacturing sector surged from 21.3 per cent in year 1991 to 31.3 per cent in year 2000. However, in year 2005, it declined to 25.4 per cent. The share of the services sector meanwhile increased to

44.9 per cent in year 2005 compared to 40 per cent in year 2000. In 1991, this sector recorded 45.7 per cent.

Table 3: Gross Operating Surplus & Gross Mixed Income by sectors, Malaysia

Sectors	RM Million			Share %		
	1991	2000	2005	1991	2000	2005
Agriculture	14,188	24,982	35,052	14.7	10.7	9.7
Mining & Quarrying	12,096	36,978	70,588	12.5	15.9	19.5
Manufacturing	20,543	72,742	92,235	21.3	31.3	25.4
Construction	5,581	4,896	1,998	5.8	2.1	0.6
Services	44,119	93,102	162,697	45.7	40.0	44.9
TOTAL	96,526	232,701	362,569	100.0	100.0	100.0

Source: DOSM

Although the share of the agriculture sector decreased, the value of gross operating surplus/gross mixed income increased primarily due to higher commodity prices such as oil palm experienced in year 2005. Besides oil palm, the other contributors in the agriculture sector were forestry & logging, rubber, food crops and marine fisheries.

The share of the mining and quarrying sector continued to expand from 15.9 per cent in year 2000 to 19.5 per cent in year 2005 due to higher crude oil price. Crude oil price increased from an average of US\$27 per barrel in year 2000 to US\$50 per barrel in year 2005, this boosted the income of oil and gas companies.

As for the manufacturing sector, the share decreased from year 2000 to 2005. In terms of value, this sector expanded from RM72.7 billion to RM92.2 billion. Strong performance was registered by some of the manufacturing subsectors especially the refining of petroleum products, chemicals & chemical products and electrical & electronic products.

The share of the construction sector declined to 0.6 per cent in year 2005 from 2.1 per cent in year 2000. This similarly reflected in a decline in value.

The services sector was the largest component among the economic sectors accounting for 44.9 per cent in 2005. The wholesale and retail trade, finance and insurance and business and private services sub-sectors contributed 67.1 per cent share in the gross operating surplus.

Taxes

A tax measure is one of the several tools of fiscal policy use by governments in stabilising economic growth. Fiscal policy refers to the government's expenditure and taxation tools to influence the level of economic activity. Fiscal policy may be expansionary or contractionary, depending on the needs that arise or circumstances faced by the country.

Expansionary fiscal policy taken by the government in respect of tax measure may see a cut in the levels of direct or indirect tax. This is to encourage spending and to boost the economy. As for contractionary fiscal policy, this may involve an increase in direct or indirect tax. This will reduce the level of demand in economy and help to reduce inflation.

Chart 2: Share of taxes less subsidies as ratio of GDP(I) in current prices, 1991, 2000, and 2005

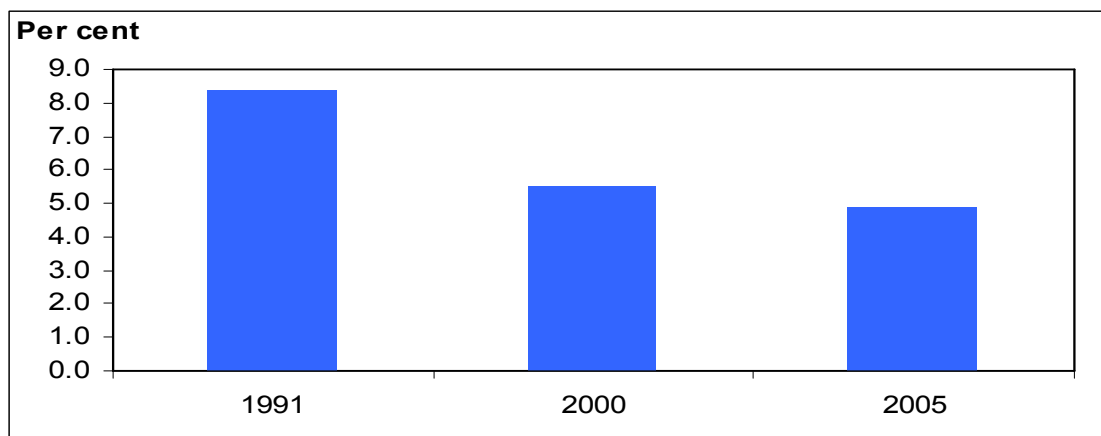


Chart 2 showed that the share of taxes less subsidies decreased from 8.4 per cent in 1991 to 4.9 per cent in 2005. The changes reflected the fiscal measures to achieve desired social and economic objectives. The decline in share of taxes less subsidies as ratio of GDP(I) from 1991 to 2005 was attributed to non-durable consumer products such as computers and IT products related taxes which have been reduced. The reduction in taxes on IT products was to encourage people to use the IT related products.

Conclusion

The estimation of GDP by income approach is essential, in particular from the perspective of returns to factors of production. A comprehensive set of time series data by economic activities are required for all the components in GDP(I) to produce comprehensive estimates. In line with the latest development of the new economic model for Malaysia, it is the right time for Malaysia to produce GDP(I) to accommodate the needs of the stakeholders and the policy makers for a better analytical tool in formulating and planning Malaysia's development policies.

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