SHARE OF LABOUR AND CAPITAL IN NATIONAL INCOME OF MALAYSIA: ESTIMATES FOR 1960-2004*

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ABSTRACT

The national income accounts provide a summary of all transactions in an economy. Seen from the income side, the production process creates incomes for the owners of the inputs used in production including labour and capital. Official data on the income accounts from the income approach are not available on an annual basis. The information is required in the computation of factor shares, that is, the share of labour and capital in income. This paper discusses the derivation of a consistent series for 1960-2004. The estimates show a decline of the labour share over time, while the capital share is increasing.

1. INTRODUCTION

Every day there are many transactions taking place in the Malaysian economy. There is the buying and selling of products and services, the collection of taxes and the payment of subsidies, the payment to workers and the return to capital on its investment. The national income accounts provide a summary of all these transactions in an economy over a period of time, usually a quarter or a year. The total value added in the economy is the gross domestic product (GDP). This can be viewed as the sum of all incomes to owners of capital and to labour (income approach); the sum of value added across all industries in the economy (production approach); or the sum of all goods and services available in the economy (expenditure approach). The information obtained through these three approaches tells us about the economic relationships within the country and with the rest of the world.

This record in national income accounts is important as the information can be used to study changes in the economy, such as growth, household consumption and savings[1]. It tells us, for example,[2]

- What is produced?
- Who produces it?
- What inputs are used?
- Who owns the labour, capital and other resources used, and what do they receive in exchange?

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[1] A recent publication that seeks to highlight the uses of the national accounts in policy-making provides many examples from around the world. See United Nations (2002).

[2] Material retrieved 25 September 2005 from http://www.stats.govt.nz/products-and-services/Articles/national-accounts-guide-Feb04.htm.

- What happens to these incomes when they are received? How much does the Government take, how much is saved?
- How much is invested?
- How much of the income has to be remitted overseas to repay debt?

To ensure that information is comparable across nations, a common set of definitions and practices are used in data collection. A comprehensive system has been designed by the Statistics Division of the United Nations. The System of National Accounts or SNA (United Nations, 2003) consists of a coherent, consistent and integrated set of macroeconomic accounts, balance sheets and tables based on a set of internationally agreed concepts, definitions, classifications and accounting rules. The SNA has been updated over time in line with the way economies and economic transitions have evolved. It promotes the integration of economic and related statistics in a system that is based on consistent economic and statistical concepts and methods, to allow domestic and international comparative analysis.

The Department of Statistics, Malaysia (DOS) produces the complete national accounts annually based on the SNA, providing estimates that are a reconciliation of figures obtained from the production and expenditure approaches (DOS, 2005). However, data based on the income approach are not regularly published. These are needed to provide answers to one particular question:

- Who owns the labour, capital and other resources used, and what do they receive in exchange?

The answer to this question allows us to compare the share of labour and capital in the production of the total output of the economy. This information has long-term implications for growth, providing information on the return on investment and productivity of labour.

This paper uses available data to derive a consistent series for the core components of the GDP, that is, the shares of labour and capital, for 1960-2004. We clarify in Section 2 the basic concepts and definitions in national income accounting, drawing primarily from the materials available on the SNA. Section 3 discusses the sources of data used in the derivation, and the methodology of derivation. The derived series are discussed in Section 4. Section 5 concludes the paper.

2. CONCEPTS AND DEFINITIONS

The growth of an economy is measured by the increase in value added produced by the individuals and enterprises operating in that economy. The national accounts are a macroeconomic depiction of the national income cycle and show the relationship between various economic variables. In this section, we provide a summary of the underlying concepts and definitions. The discussion is a synthesis of published material on the SNA available from the websites of United Nations and World Bank[3] and includes United Nations (2002; 2003).

[3] Retrieved 1 September 2005 from

2.1 The System of National Accounts

The design and structure of the SNA draws heavily on economic theory and principles as well as business accounting practices. Basic concepts such as production, consumption and capital formation are rooted in economic theory. When business accounting practices conflict with economic principles, priority is given to the latter, as the SNA is designed primarily for purposes of economic analysis and policy-making.

The SNA "consists of an integrated set of macroeconomic accounts, balance sheets and tables based on internationally agreed concepts, definitions, classifications and accounting rules. Together, these principles provide a comprehensive accounting framework within which economic data can be compiled and presented in a format that is designed for purposes of economic analysis, decision-taking and policy-making… Being a conceptual framework, it does not attempt to provide comprehensive compilation guidance on how to make estimates nor is it descriptive in setting priorities which accounts and tables should be implemented or expresses norms on the frequency and format of their presentation." [4]

The accounting rules and procedures used in the SNA are based on established practices in business accounting. The traditional double-entry book-keeping principle, whereby a transaction gives rise to a pair of matching debit and credit entries within the accounts of each of the two parties involved in the transaction, is a basic axiom of economic or national accounting. In general, a transaction between two different institutional units always requires four equal, simultaneous entries in the accounts of the SNA even if the transaction is a transfer and not an exchange and even if no money changes hands. These multiple entries enable the economic interactions between different institutional units and sectors to be recorded and analyzed. However, transactions within a single unit (such as the consumption of output by the same unit that produced it) require only two entries whose values have to be estimated.

The SNA includes the following main accounts:

- the production account (components of gross output)
- the primary distribution of income account (incomes generated by production)
- the transfers account (including social spending)
- the household expenditure account
- the capital account
- the (domestic) financial transactions account
- the changes in asset values account
- the assets and liabilities account (balance sheet)
- the external transactions account

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http://www.worldbank.org/data/archive/wdi/tab4_1.htm;
http://unstats.un.org/unsd/sna1993/tocLev8.asp?L1=6&L2=13;
www.worldbank.org/data/countrydata/aag.htm;
unstats.un.org/unsd/snaama/glossResults.asp?Id=8
unstats.un.org/unsd/sna1993/tocLev8.asp?L1=1&L2=9

[4] Material retrieved 25 September 2005 from http://unstats.un.org/unsd/sna1993/introduction.asp.

These accounts include various annexes and sub-accounts, and standards are also provided for input-output tables showing the transactions between economic sectors.

2.2 Definitions[5]

For an economy, the total supply of goods and services must equal the total uses. In an open economy engaging in foreign trade, the total supply of goods and services consists of domestically produced output and imports. The uses consist of intermediate consumption, final consumption, gross capital formation and exports. Thus:

total supply of goods and services = total uses of goods and services

output + imports = intermediate consumption + final consumption + gross capital formation + exports

Gross value added is the value of all goods and services produced during a production period but not immediately used up in the production process of that period. Hence,

gross value added = output – intermediate consumption
= final consumption + gross capital formation + exports - imports

The items intermediate consumption, final consumption and gross fixed capital formation on the uses (right-hand) side of the equation are measured from the perspective of the purchaser. Their values take into account the taxes and subsidies on goods and services. Taxes on products increase, and subsidies on products lower, the prices payable by consumers. However, output is measured from the perspective of producers in terms of the receipts receivable by them, leaving all of the taxes on goods and services aside while including subsidies on goods and services. Therefore, taxes on goods and services have to be added and subsidies subtracted from output in order to arrive at a uniform valuation of supply and uses. Hence,

output + taxes – subsidies – intermediate consumption = final consumption + gross capital formation + exports – imports,

where,

Gross domestic product (GDP) = output + taxes – subsidies – intermediate consumption.

GDP can be measured in three ways, i.e., the production approach, the expenditure approach and the income approach:

- *GDP by production approach*. The values for output and intermediate consumption aggregated across the various industries of an economy, so that

$$\text{GDP} = \text{gross value added} + \text{taxes} - \text{subsidies} \quad (1)$$

[5] This section is from United Nations (2003, Chapter 1).

- *GDP by expenditure approach*. The value of all goods and services available for different domestic final uses or for exports of an economy, so that

  GDP = final consumption + gross capital formation + exports – imports (2)

- *GDP by income approach*. The value of incomes for the owners of the inputs used in production, owners of capital and the government, so that

  GDP = compensation of employees + taxes - subsidies + gross operating surplus of incorporated enterprises + operating surplus of unincorporated enterprises (3)

As an aggregate measure of production, gross domestic product refers to production of all resident units within the borders of a country. Some of the productive activities of residents may take place abroad, while some production taking place within a country may be attributed to temporary and seasonal foreign labour. Thus, some primary income generated within the country may go to non-resident units while some primary income generated in the rest of the world may go to resident units. The concept of gross national income (GNI) seeks to measure the net income due to their ownership of factors of production received by residents in a country, where residents are defined based on their centre of economic interest. Hence,

GNI = GDP + compensation of employees and property income from the rest of the world – compensation of employees and property income to the rest of the world

The underlying rationale behind the concept of the GDP for an economy as a whole is that it should measure the total gross values added produced by all institutional units resident in that economy. However, while the concept of GDP is based on this principle, GDP as defined in the SNA may include not only the sum of the gross values added of all resident producers but also various taxes on products, depending upon the precise ways in which outputs, inputs and imports are valued, such as in producers' values or in purchasers' values.

The pricing of GDP values can be in nominal values or in constant prices. In analyzing growth, it is real growth that is of interest, that is, where changes in income are measured in constant prices from one period to the next so as to eliminate the impact of price changes. Real GDP is then GDP valued at constant prices. In principle, real value added can be estimated by measuring the quantity of goods produced in a period, valuing them at an agreed set of base year prices, and subtracting the cost of inputs, also in constant prices.

2.3 Measurement Issues

Technical progress can lead to improvements in production and quality of goods. If not properly accounted for, either effect can distort measures of value added and thus of growth. When inputs are used to estimate output, as in services, unmeasured technical progress leads to underestimates of the quantity and real value of output. Unmeasured changes in the quality of goods produced also lead to underestimates of their real

values. The result can be underestimates of real growth and productivity change and overestimates of inflation.

Non-market services pose a particular problem, especially in developing countries, where much economic activity may go unrecorded. Obtaining a complete picture of the economy requires estimating household outputs produced for local sale and for home use, barter exchanges, and illicit or deliberately unreported activities. In Malaysia, this information is usually collected for the formal economy, although there is recognition of the importance of the informal economy and attempts to include it (Aziz, 2004). Various concerns have led to changes in the coverage of the SNA, including the construction of accounts for environmental resources, the measurement of the trade in services and of capital stocks and the monetary values of unpaid housework or unpaid voluntary labour.[6]

3. METHODOLOGY

The GDP is the sum total of value-added in the economy. This section discusses the methodological issues in obtainingand measuring the value-added components accrued to labour and capital as a fraction of GDP, or the factor shares. Sources of data and issues pertaining them are also discussed, as there are a number of difficulties arising from the way the GDP has been reported over the years.

3.1 The Derivation of Factor Shares

The determination of factor shares, that is, the share of each of the factors employed in the production of goods and services, is based on real GDP at factor cost. Real values ensures that the shares are calculated for output and are not affected by price. Measurement at factor cost measures the value of output after taking out the effects of price distortion resulting from indirect taxes and subsidies. Real GDP at factor cost then is the result of the effort of workers, land (including natural resources), capital and entrepreneurship.

In the production approach to national accounts, the total value of output produced in the economy in a year yields the national product. Equation (1) shows that the output includes all goods and services produced by the industries in the economy. In the income approach, the sum of total earnings of factors of production of an economy in a year gives the national income. From equation (3), the main sources of income include wages, rents, profits and interest to workers and owners of capital, land and property.[7] The earnings of factors of production are circulated into the economy when they are used to pay for goods and services. Therefore, the national income is equal to the value of national product, and the right-hand side of equation (1) is equal to the right-hand side of equation (3). This is given as follows:

$$\text{Gross value added} = \text{compensation of employees} + \text{gross operating surplus of incorporated enterprises} + \text{operating surplus of unincorporated enterprises} \quad (4)$$

[6] A summary of a 2005 French publication on the history of national accounting (Vanoli, 2005) is illuminating. See http://www.insee.fr/en/ffc/docs_ffc/cs103h.pdf (Accessed 3 October 2005).
[7] See http://internationalecon.com/v1.0/Finance/ch5/5c010.html (Accessed 23 October 2005).

The gross value added thus shows the total output net of price distortion, or the GDP at factor cost.

The usual approach, or the "naïve" approach as referred to by Gollin (2002), is to treat compensation in equation (4) as labour income. The gross operating surplus that is defined as the residual, or the amount by which value added exceeds the total employee compensation, is treated as capital income. Equation (4) then shows that the value of aggregate output (*VA*) is equal to the labour income represented by total wage bill (*W*) plus total capital income (π), that is:

$$VA = W + \pi$$

Dividing through by VA gives:

$$1 = \frac{W}{VA} + \frac{\pi}{VA} = s_L + s_K \qquad (5)$$

where s_L is the share of labour and s_K is the share of capital. This relation is purely an accounting identity and no assumption is required about the state of the economy (Felipe, 2005).

3.2 Issues Related to the Measurement of Labour Income

The compensation of employees is the "total remuneration in cash or in kind payable by employers to employees for the work done. Direct social transfers from employers to their employees or retired employees and their family, such as payments for sickness, educational grants and pensions that do not set up an independent fund, are also imputed to compensation of employees" (United Nations, 2003). The compensation of employees is usually used to measure the total wage bill.

Gollin (2002) argues that the compensation series omits the labour income of people who are not employees. In particular, the wages of the self-employed are excluded from the first component in the right hand side of equation (4). According to the SNA, the labour income of the self-employed does not go into compensation, but is instead treated as a form of business income. The implication of this practice is that the operating surplus of private unincorporated enterprises (OSPUE) is essentially a combination of capital and labour income for businesses owned by households. This then provides an inaccurate picture of the labour share. Adjustments need to be made to obtain a better representation of labour's share.

Equation (4) can be rewritten as:

> Gross value added = [compensation of employees + wages of self-employed] + gross operating surplus of incorporated enterprises + [operating surplus of unincorporated enterprises – wages of self-employed]

The first component in the brackets on the right hand side of this equation provides a more accurate estimate of the labour income. In this paper, we refer to this component as the adjusted labour income. Using the ratio of this component to GDP at factor cost, we obtain the adjusted labour share, and equation (5) now becomes

$$1 = s'_L + s'_K$$

where s'_L and s'_K represent the adjusted labour share and adjusted capital share, respectively.

As data on self-employment income are usually not available, Gollin (2002) proposes three methods to estimate the labour income of the self-employed. The first two methods reallocate a share of the OSPUE as labour income by:

- Treating all OSPUE as labour income, or
- Assuming that the share of labour to capital in OSPUE is the same as that for the rest of the economy, that is, the government and incorporated enterprises

The first method suffers the disadvantage of overstating the labour income by including the capital invested in businesses of the self-employed. This problem may not less severe in the second method, but the second method assumes that income shares for enterprises owned by households are the same as that for the public or incorporated enterprises.

The third method can be employed when data is available on the composition of the workforce. This method involves:

- Imputing employee compensation for the self-employed into total compensation by scaling up average compensation per employee to all workers in the labour force.

The use of additional information on employee composition of the workforce avoids the need to decide on how OSPUE should be divided between labour and capital, but this method assumes that the average income of the self-employed is the same as that of the employees.

3.3 Sources of Data

The data used in this study are mainly extracted from publications of the Department of Statistics, Malaysia. As some publications were discontinued, more than one source may be used for the same variable. The key variables and sources of data from which they are obtained are shown in Table 1.

3.4 Issues Related to Data on GDP

Annual data on national accounts are published by DOS, which provide estimates of GDP that are a reconciliation of figures obtained from the production and expenditure approaches. The main items are available from 1947 for Peninsular Malaysia (then Federation of Malaya), and from 1963 for Malaysia.

Table 1: Sources of Data

Variable	Source
GDP at factor cost	National Accounts Statistics
Compensation	Distribution and Use of Income Accounts and Capital Account National Accounts of Peninsular Malaysia 1960-1971
Total number of people employed Percentage of employees	Labour Force Surveys
Total Earnings and number of persons engaged in selected industries	Malaysia Economic Statistics – Time Series 2002

Factor shares may be calculated using constant or current prices. The estimated shares would be the same because the same price deflator is used to obtain the series at constant prices. The computation of these shares is therefore based on data in current values. The derivation of a consistent series of the accounts from the income approach for 1960-2004 needs to take into consideration a number of separate aspects as below:

- The years for which published data are available;
- The publications in which these data are available;
- The valuation of output;
- The changes in the compilation of the national accounts from the SNA of 1960 to that of 1968, which was implemented from 1969; and
- The change in political entity from the Federation of Malaya (now Peninsular Malaysia) to Malaysia (comprising Peninsular Malaysia, Sabah and Sarawak).

Of particular interest are the changes in the SNA adopted from 1969 (DOS, 1975). The concepts, terminology, sources of data and estimation methods differ from that used previously. A comparison of changes in terminology is shown in Figure 1. The terms used to value GDP are noted below:

- *GDP at factor cost.* Pre-1968 SNA. The output of the nation measured in terms of payments to the factors of production used, namely, compensation of employees, and gross operating surplus. This can be measured as:

  A gross concept, industrial origin of GDP at factor cost, or

  A net concept, net domestic product at factor cost (which is industrial origin of GDP at factor cost less depreciation).

- GDP at market prices. Pre-1968 SNA. Prices actually paid by purchasers, including the net effect of all indirect taxes and subsidies. This is the value of output at factor cost plus indirect taxes (or taxes on production) less subsidies.

- National income. Pre-1968 SNA. This is the income due to all factors of production in the country from the current production of goods and services. Known as the net national product at factor cost, it is net domestic product at factor cost plus or minus net factor incomes paid abroad.

- GDP at purchasers' prices. 1968 SNA. The cost of goods and services in the market to the point of delivery to the purchaser. Goods and services are valued at producers' values (that is, in terms of receipts receivable by them) plus the trade and transport margins appropriate to the purchaser in question. This corresponds to GDP at market prices as defined in the pre-1968 SNA.

- Gross national income. 1968 SNA. This is the net income (receipts less payments) received by resident units of the economy as a result of its ownership of factors of production (i.e., labour and capital, including financial and non-financial produced and non-produced capital). This corresponds to national income as defined in the pre-1968 SNA plus net indirect taxes.

4. ESTIMATES OF FACTOR SHARES

The estimation of factor shares requires information on GDP at factor cost and labour income. Apart from the changes in definitions, data are not available on an annual basis. This section first explains how a set of consistent series on GDP at factor cost and three different measures of labour income were obtained. The computation of factor shares and their patterns are then discussed. The estimates of GDP at factor cost and three different labour share estimates are shown in the Appendix.

4.1 GDP at Factor Cost

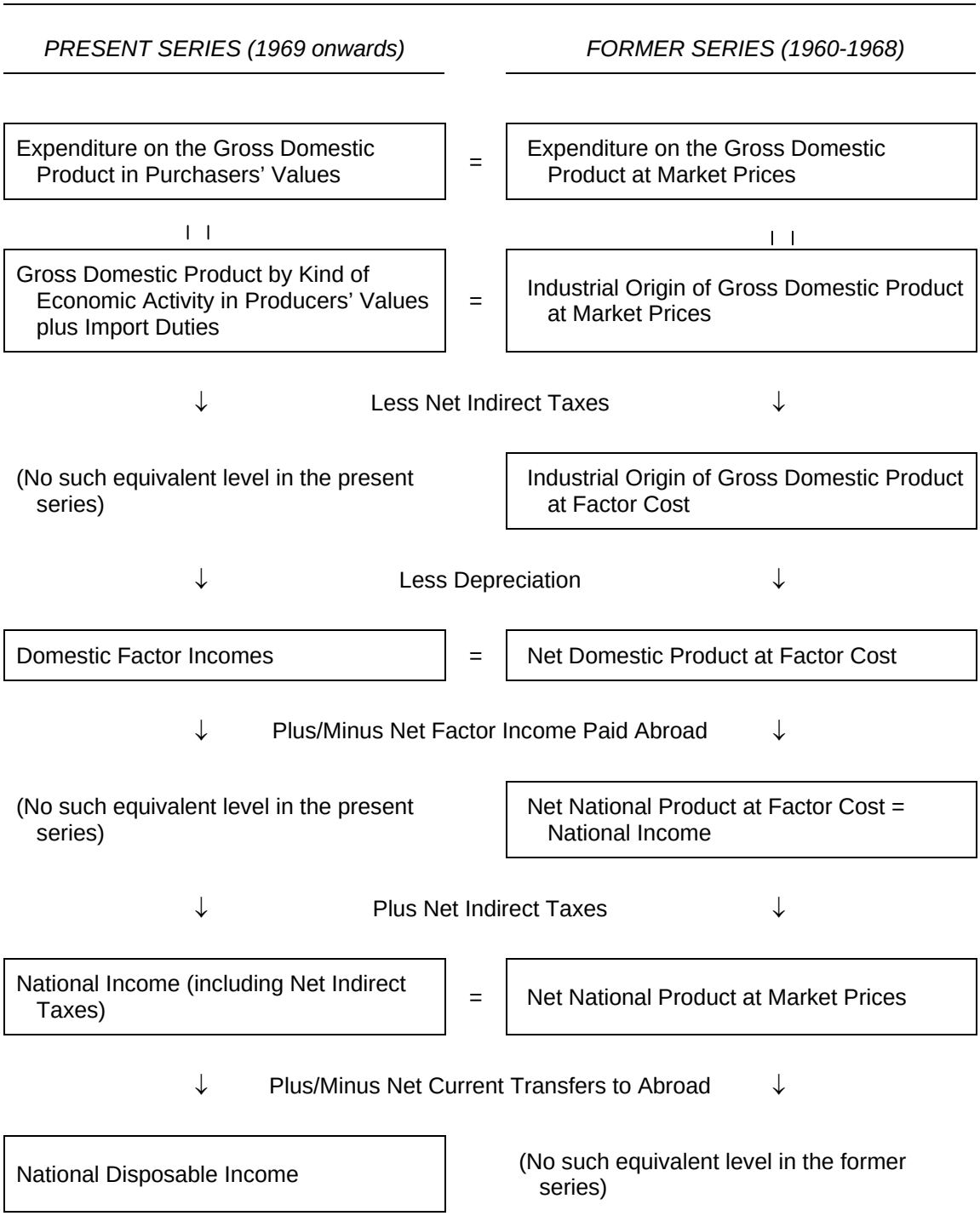
Published data on GDP at factor cost in producers' values in current prices for Peninsular Malaysia are available only from 1960 to 1971 (DOS 1965; 1975). However, a consistent series on GDP in purchasers' prices is available in current prices from 1960-2002 and in real prices from 1970-2002 (DOS, 2003). Values prior to 1963 refer to Peninsular Malaysia, and values prior to 1969 refer to GDP at market prices. For 2003 and 2004, the values are from DOS (2005).

The following procedure was followed to obtain a consistent series for GDP at factor cost for Malaysia based on GDP at purchasers' prices:

- The GDP in purchasers' prices series was first adjusted to create a consistent series in current prices for Malaysia for 1960-2004. Values from 1960 to 1962, which were for Peninsular Malaysia, were adjusted to reflect Malaysia figures, based on ratio of GDP for Sabah and Sarawak to that for Malaysia.[8]

[8] This ranged from 0.12 in the early 1960s to 0.15 in 1970, based on current GDP at market prices (Table 2-4, *First Malaysia Plan, 1971-1975*, p.25). The values from 1960-1963 were adjusted upward by 0.12, and then an increasing adjustment factor was used for the rest of the data to reach 0.15 in 1970.

Figure 1. Changes in Terminology in the System of National Accounts, 1968



Source: DOS, 1975, p.54

- Current values for missing years for GDP at factor cost were estimated from GDP in purchasers prices in current prices based on available data.[9]

4.2 Unadjusted Labour Income

Compensation of employees is shown in the national income accounts. This series measures only the labour income accrued to people who work as employees, and is not adjusted for labour income of those who are not employees. This series measures the labour income accrued to people who work as employees.The following steps were taken to obtain a consistent series for compensation:

- The compensation data was adjusted to obtain a consistent series for Malaysia. Values for 1960-1970 were adjusted to reflect Malaysia figures based on the ratio of GDP for Sabah and Sarawak to that for Malaysia. The adjustment factors employed are similar to those used for adjusting the GDP series (see footnote 8).

- Data on compensation are not available for 1972-77, 1979-82, 1984-86, 1988-92, 1994, 1998, 2000 and 2002-04. These gaps were filled by the predicted values obtained from a regression of compensation on GDP estimated for years where data are available.[10]

4.3 Adjusted Labour Income

In years when data are available, the national accounts provide information on employee compensation, as well as taxes less subsidies on production and imports recorded at the level of the total economy. The gross operating surplus shown is then computed as the residual, net of these items, out of GDP at purchasers' prices (see equations (1) and (3)). Although the gross operating surplus is published for selected years, that for OPSUE is not available. Estimating the income of self-employed based on the OSPUE is therefore not possible.

The method adopted in this study is therefore the third method proposed by Gollin (2002), which involves scaling the average wage up for the entire workforce by multiplying the average employee compensation by the number of people in the workforce. Apart from data on compensation, this method requires information on the total number of persons employed in the economy and the proportion who are employees. The following procedures were followed to fill in the gaps for data that are not available:

[9] The regression line used for estimation is $\hat{Y} = -54.78+0.842*X$ where Y is GDP at factor cost and X is GDP at purchasers' prices.

[10] The regression line used for estimation is $\hat{Y} = 882.7421 + 0.3595X$ where Y is compensation and X is GDP at factor cost.

- The data on total number of persons in employment are available from 1970-2003. The figures from 1960-69 were estimated from the regression of total employed on the population size using available data.[11]

- The percentage of total number employed as employees are available from 1981-2002. The regression equation of percentage of employees on total employment based on available data was used to predict the values for 1960-1980.[12]

Gollin's third method was then implemented as follows:

- The total compensation was divided by the number of employees to obtain the average labour income for the employees.

- The average employee income (or average compensation) was multiplied by the total employment to obtain the adjusted labour income.

Specifically, the adjusted labour income (Gollin's method) is given by:

$$\frac{\text{Employee Compensation}}{\text{Number of employees}} \text{ x Total Workforce}$$

Data on total earnings and the number of persons engaged in selected industries are available from 1972-2000. Total earnings refer to the income of the employees and self-employed. These data were used to construct another series for adjusted labour income using the principles of Gollin's third method. The following procedure was implemented to obtain a complete series for earnings:

- The industries for which the data are available were identified. These are construction, manufacturing, mining, stone quarrying, services (including finance, health, education) and transportation.

- Total earnings before 1972 were estimated. The ratio of total compensation to total earnings was computed for years where data are available, i.e., 1978, 1983, 1987, 1993, 1995-99 and 2001. This ratio is 0.0.6516. The employee compensation for 1963-1971 was then scaled up using this ratio to obtain the total earnings.

- Total earnings for 2001-2004 were predicted from the regression of total earnings on GDP at factor cost using data for 1972-2000.[13]

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[11] The regression line used for estimation is $\hat{Y}$ = -1645.7074 + 0.4622X where Y is total employment and X is population size.

[12] The regression line used for estimation is $\hat{Y}$ = 45.5346 + 0.0033X where Y is percentage of employees and X is total employment.

[13] The regression line used for estimation is $\hat{Y}$ = 1648.9133 + 0.5589X where Y is total earnings and X is GDP at factor cost.

The modified Gollin's method is implemented according to the following steps:

- The average earnings per labour were computed by dividing total earnings by the total number of persons engaged.

- The average earnings per labour were then multiplied by the total number of people in the workforce to get adjusted labour income based on average earnings.

Specifically, the adjusted labour income (Gollin's method-modified) is given by:

$$\frac{\text{Total Earnings in selected industries}}{\text{Number of persons engaged in selected industries}} \times \text{Total Workforce}$$

4.4 Estimates of Labour Income

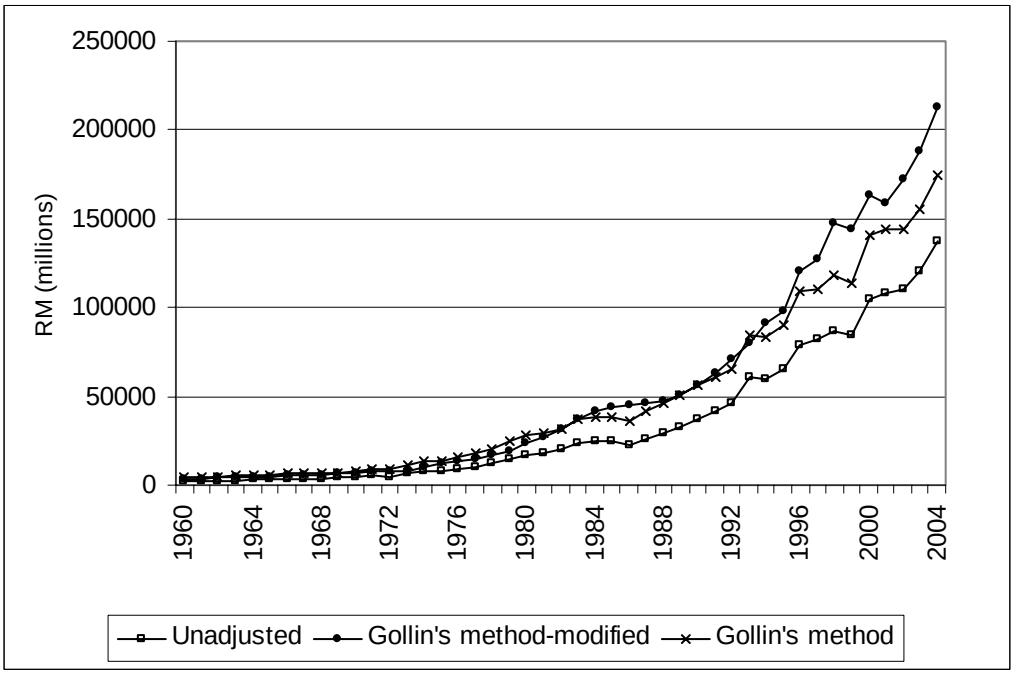
The estimated series for the unadjusted and adjusted total labour income (Gollin's method and Gollin's method-modified) are shown in Figure 2. Both the adjusted labour income series move closely with the unadjusted series up to mid 1970s. After that, both the adjusted series show a greater increase than the unadjusted series, indicating that total labour income has increased more rapidly than employee compensation. This implies that the usual computation of labour share as the ratio of compensation to GDP may be seriously flawed and highlights the importance of including entrepreneurial wages in the computation of labour income.

The two adjusted labour income series follow closely each other before the 1990s. Generally, the Gollin's method-modified (based on average earnings) yields lower estimates compared to those obtained using Gollin's method (based on average compensation) before 1984, but a reversed pattern is observed after that. The discrepancy is particularly obvious in the 1990s and the divergence between the two series grows wider towards the end of the period of analysis. The pattern suggests that the average (adjusted) labour income of the non-employees has been increasing faster than that for the employees.

4.5 Estimates of Factor Shares

The unadjusted labour share is computed as the ratio of total employee compensation to GDP at factor cost. The adjusted labour share is computed as the ratio of total labour income to GDP at factor cost for each of the two adjusted series. The three labour share series are shown in Figure 3. The unadjusted factor shares show relatively little change across time, while the adjusted figures show a declining labour share. The adjustment based on average compensation (Gollin's method) leads to a smoother series than the adjustment based on average earnings (Gollin's method-modified).

Figure 2: Estimates of Total Labour Income



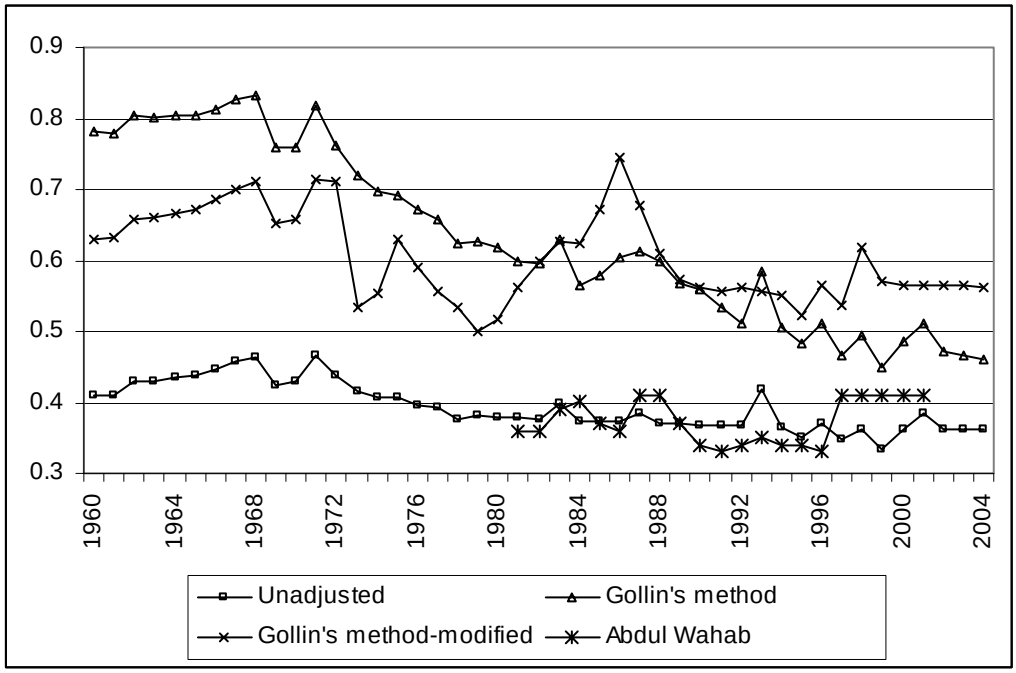
Notes: The unadjusted series show the total employee compensation. Gollin's method refers to the income adjusted based on average employee compensation. Modified Gollin's method refers to the income adjusted based on average earnings.

The unadjusted labour share is on average about 0.4. The labour share based on average compensation declines from about 0.78 in 1960 to 0.46 in 2004, while the corresponding values based on average earnings decline from 0.63 to 0.56. This suggests that wages of non-employees as a share of national income have been sharply declining over time. However, all three labour share series show relatively little change between 1990 and 2004. During this period, the unadjusted labour share is on average 0.37, while the labour share based on average compensation has a mean of 0.50, and the mean for that based on average earnings is 0.56. This suggests that on the average during this period, the wages of the non-employees are between 26-34 per cent of labour income, depending on the adjustment factor used.

Abdul Wahab (2004) has estimated the factor shares for 1981-2001. These factor shares are included in Figures 3 for comparison. The values fluctuate around the unadjusted factor shares of this study. The labour share estimates provided by Abdul Wahab averaged to about 0.4, which is close to the mean of the unadjusted share. This suggests that the labour share in his study did not account for the labour income that accrues to non-employees.[14]

[14] Abdul Wahab used the growth rate of per-worker compensation to interpolate the values for years when data were not available. His explanation that "the data on compensation were divided by the number of employed persons to obtain compensation per worker" (p. 216) suggests that the number of employees was not used as the denominator. Hence, the resultant estimate would be the ratio of total compensation to national income, which is the unadjusted labour share.

Figure 3: Labour Share, 1960 – 2004



Notes: The unadjusted share, and the adjusted share based on Gollin's method and modified method are computed using the labour income shown in Figure 2. The other series is obtained from Abdul Wahab (2004).

It is interesting to examine the contribution of the non-employees to labour income in order to understand the distribution of income. The labour share accrued to the self-employed and other entrepreneurs who are non-employees is estimated as follows:

$$\frac{\text{Total labour income - Employee compensation}}{\text{GDP at factor cost}}$$

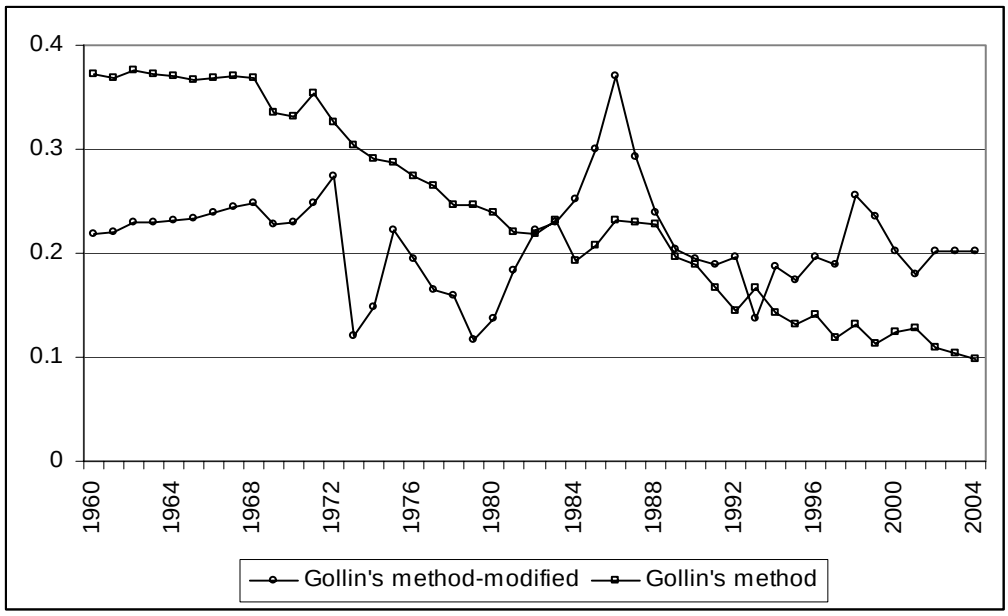
This labour share is computed for each of the adjusted labour income series and the estimates are shown in Figure 4.

The series based on average earnings fluctuates around 0.2 but the series based on average compensation shows a gradual decline from 0.4 to 0.1, lying below the former from 1984. The mean of the former series is 0.21 and the mean of the latter series is 0.24. The fluctuations in the series based on average earnings are similar to the corresponding series of total labour share in Figure 3. This implies that fluctuation in the labour share adjusted based on average earnings is mainly due to the movements in the non-employee labour income. The gradual decline in the non-employee labour share (the series using average compensation) ties in with the observation of Gollin (2002) that it is the long-term shift in the structure of the economy from agriculture to industrial-based enterprise that has led to changes in the structure of employment. The share of

entrepreneurial income has shrunk over time with reallocation of labour from agriculture and self-employment to industrial wage-receiving employees.

The capital share is computed as one minus the labour share. The capital share based on the three labour share series as well that of Wahab's are shown in Figure 5. Wahab's series fluctuates around the unadjusted capital share series. The adjusted series show a steady increase towards the unadjusted series. The adjusted share based on average compensation (Gollin's method) increases faster than the series based on average earnings (Gollin's method-modified) after 1990. This corresponds to the observed decrease in the share of entrepreneurial income over time, and reflects the structural changes in the economy.

Figure 4: Share of Entrepreneurial Labour Income, 1960-2004



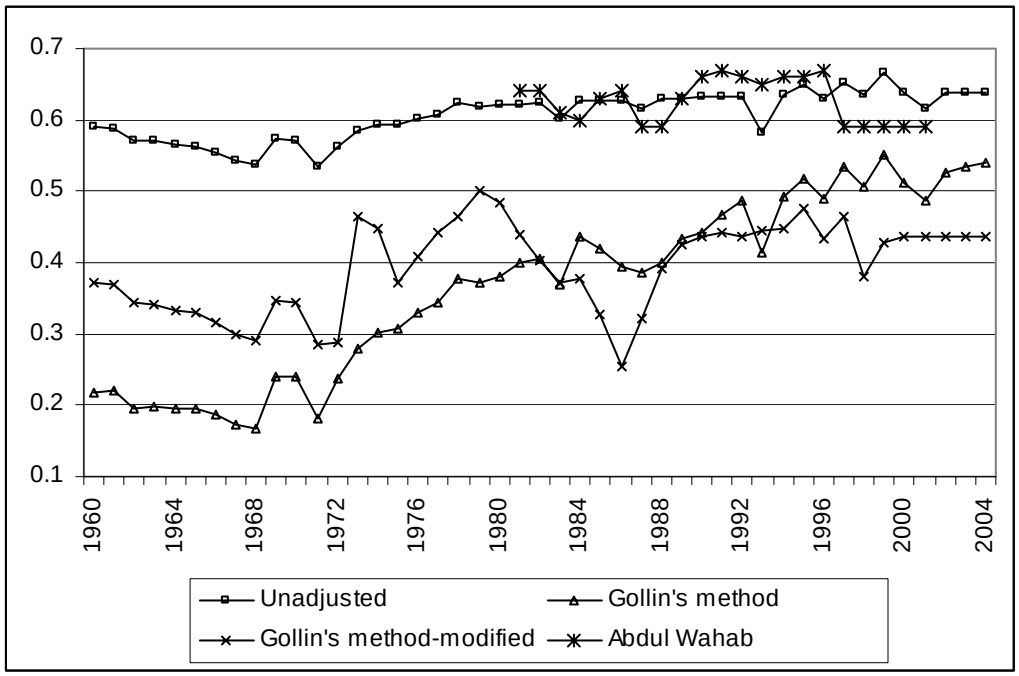
Notes: The two series are computed using the corresponding labour income estimated based on Gollin's method and modified method shown in Figure 2.

5. CONCLUSION

This paper has addressed the estimation of factor shares for Malaysia for the period 1960-2004. It has required the derivation of the core series on real GDP at factor cost, total compensation and total earnings. Labour income was obtained using compensation, and adjusted labour income was obtained using average earnings and average compensation. Over the period, the adjusted labour share based on average compensation declines from about 0.8 to just under 0.5, while the adjusted share based on average earnings declines from about 0.7 to just under 0.6. The adjusted share series are more in line with the range of values (0.6–0.85) observed in the developed economies (Gollin, 2002). In general, the labour share is declining while the capital share is increasing over time.

Some of Gollin's explanations for the differences in factor shares across countries are useful for understanding the decline in labour share over time. Improvements in technology in the long run would have shifted the production frontier outwards leading to a change in the relationship between labour input and output. The same amount of output can be produced using lesser labour input at a higher production frontier. The overall elasticity of substitution between labour and capital could have increased with advancement in production technology. Mechanization has been increasingly important and the process of capital accumulation has shifted income from labour to capital.

Figure 5: Capital Share, 1960 - 2004



Notes: The capital share is computed as one minus the labour share for the three series shown in Figure 3.

REFERENCES

Abdul Wahab, Muhamad (2004). National Reports - Malaysia, in *Total Factor Productivity Growth: Survey Report*, Tokyo: Asian Productivity Organization, pp. 210-232.

Aziz Fikry bin Mohammad (2004). Measuring the non-observed economy in Malaysia. Paper presented at the OECD/ESCAP/ADB Workshop on Assessing and Improving Statistical Quality: Measuring the Non-observed Economy. Retrieved 25 September, 2005 from www.unescap.org/stat/meet/wnoe/waisq_malaysia2.pdf.

Department of Statistics, Federation of Malaya (1965). *National Accounts of the States of Malaya, 1955-1963*. Kuala Lumpur: Author.

Department of Statistics, Malaysia (1975). *National Accounts of Peninsular Malaysia 1960 - 1971*. Kuala Lumpur: Author.

Department of Statistics, Malaysia (1978). *National Accounts Statistics 1971 - 1975*. Kuala Lumpur: Author.

Department of Statistics, Malaysia (1984). *National Accounts of West Malaysia 1978 - 1981*. Kuala Lumpur: Author.

Department of Statistics, Malaysia (2003). *Malaysia Economic Statistics – Time Series 2002*. Putrajaya: Author.

Department of Statistics, Malaysia (2005). *Malaysia: Annual National Product and Expenditure Accounts 1987-2004*. Putrajaya: Author.

Felipe, Jesus (2005). Competitiveness, income distribution and growth in the Philippines: What does the long-run evidence show? Working paper, Asian Development Bank, Manila.

Gollin, Douglas (2002). Getting income shares right, *Journal of Political Economy*, 110:2, 458-474.

Nagaraj, Shyamala (1972). *The Determinants of Investment Behaviour in Malaysia*. M. Economics Thesis submitted to the University of Malaya.

Rao, Bhanoji V. V. (1976). *National Accounts of West Malaysia 1947-1971*. Singapore: Heinemann Asia.

Tan, Poo-Chang (1978). *A Study of Consumption Patterns for West Malaysia, 1955-1980*. M. Economics Thesis submitted to the University of Malaya.

United Nations (2002). *Handbook of National Accounting: Use of Macro Accounts in Policy Analysis*. New York: Author. Retrieved 25 September 2005 from unstats.un.org/unsd/publication/SeriesF/SeriesF_81E.pdf

United Nations (2003). *Handbook of National Accounting: National Accounts, A Practical Introduction*. New York: Author. Retrieved 25 September 2005 from unstats.un.org/unsd/publication/SeriesF/seriesF_85.pdf

Vanoli, André (2005). *A history of national accounting* Amsterdam: IOS Press

APPENDIX

GDP at Factor Cost and Labour Share

Year	GDP at factor cost (RM millions)	Unadjusted labour share	Adjusted labour share	
			Estimated from average compensation	Estimated from average earnings
1960	5,627.27	0.410	0.783	0.629
1961	5,697.73	0.411	0.779	0.631
1962	6,007.95	0.428	0.805	0.657
1963	6,392.05	0.430	0.801	0.659
1964	6,871.59	0.434	0.804	0.666
1965	7,446.59	0.437	0.804	0.671
1966	7,792.05	0.446	0.814	0.685
1967	8,003.41	0.457	0.827	0.701
1968	8,232.95	0.463	0.832	0.710
1969	9,545.45	0.425	0.760	0.653
1970	10,271.59	0.428	0.759	0.657
1971	11,071.00	0.465	0.818	0.714
1972	11,381.00	0.437	0.763	0.712
1973	15,770.00	0.415	0.720	0.535
1974	19,120.00	0.406	0.697	0.554
1975	18,966.00	0.406	0.692	0.629
1976	23,592.79	0.397	0.671	0.592
1977	27,175.50	0.392	0.657	0.557
1978	31,845.23	0.376	0.623	0.535
1979	39,034.23	0.382	0.628	0.499
1980	44,830.56	0.379	0.619	0.516
1981	48,455.37	0.378	0.599	0.562
1982	52,653.58	0.376	0.594	0.598
1983	59,259.07	0.398	0.630	0.628
1984	66,926.32	0.373	0.565	0.624
1985	65,174.96	0.373	0.580	0.672
1986	60,227.37	0.374	0.605	0.745
1987	68,218.79	0.384	0.614	0.677
1988	77,720.76	0.371	0.599	0.610
1989	88,551.41	0.369	0.567	0.574
1990	100,211.42	0.368	0.558	0.562

GDP at Factor Cost and Labour Share (cont'd)

Year	GDP at factor cost (RM millions)	Unadjusted labour share	Adjusted labour share	
			Estimated from average compensation	Estimated from average earnings
1991	113,719.63	0.367	0.534	0.557
1992	126,819.46	0.366	0.512	0.563
1993	144,932.57	0.418	0.585	0.555
1994	164,523.38	0.365	0.507	0.551
1995	187,267.49	0.351	0.483	0.524
1996	213,587.56	0.369	0.511	0.565
1997	237,216.61	0.348	0.467	0.537
1998	238,435.83	0.363	0.495	0.619
1999	253,188.51	0.335	0.448	0.571
2000	288,932.25	0.363	0.487	0.563
2001	281,513.39	0.384	0.512	0.565
2002	304,759.32	0.362	0.472	0.564
2003	332,549.53	0.362	0.466	0.564
2004	378,516.00	0.362	0.460	0.563