## Decomposing the Transformation of Malaysia's Real Resource Balance, 1982-1987

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### DECOMPOSING THE TRANSFORMATION OF MALAYSIA'S REAL RESOURCE BALANCE, 1982-1987

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#### ABSTRACT

This paper decomposes the improvement that occurred in Malaysia's real resource balance between 1982 and 1987 into the contributions made by absorption, expenditure-switching, output-switching and growth effects. All four effects are estimated to have made positive contributions. Within the absorption effect, restrictive demand policy exerted a strong influence; expenditure-switching appears to have reflected a fall in import-intensive investment; and output-switching was dominated by the manufacturing sector. Both expenditure-switching and output-switching occurred despite indications of a decline in the prices of tradables relative to non-tradables. Finally, notwithstanding the fall in investment, growth in the capital stock is identified as the factor principally responsible for the large positive contribution of the growth effect.

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#### 1. INTRODUCTION

In the early 1980s Malaysia experienced a rapidly deteriorating current account position as a result of a combination of world recession, declining terms of trade and expansionary domestic demand policies. By 1982 the deficit on the current account of the balance of payments had reached a potentially alarming US\$3.6 billion, equivalent to 13.4 per cent of GDP. This percentage was by far the largest recorded for any of the ASEAN economies at that time.

In the following five years, however, the Malaysian current account deficit continuously shrank and eventually, in 1987, turned into a substantial surplus of US\$2.6 billion. The improvement reflected an even greater improvement in Malaysia's resource balance, i.e. its balance of trade in goods and services. From a deficit of US\$2.4 billion in 1982, the resource balance moved in a consistently favourable manner to reach a surplus of US\$4.5 billion in 1987.

The improvement in the resource balance was not assisted in any sustained way by movements in Malaysia's terms of trade which by 1987 had actually fallen a net 2.9 per cent below their 1982 level. Contrasting movements in export and import volumes, not prices, were the sources of the improvement. Between 1982 and 1987 exports of goods and services, valued at 1978 domestic-currency prices, increased by as much as 64.4 per cent from M\$24,826 million to M\$40,819 million ringgit, while imports of goods and services, also valued at 1978 domestic-currency prices, increased by only 6.2 per cent from M\$28,724 million to M\$30,505 million. Thus the real resource balance (1978 prices) was transformed from a very substantial deficit of M\$3,898 million, equivalent to 5.9 per cent of GDP at 1978 prices, to an absolutely much larger surplus of M\$10,314 million, equivalent to 16.9 per cent of GDP at 1978 prices.

The aim of this paper is to identify quantitatively the factors responsible for the extraordinary transformation of Malaysia's real resource balance between 1982 and 1987. In particular, it seeks to decompose the change in the balance over this period into the effects of:

- the change in total real domestic absorption of goods and services;
- expenditure-switching (the change in the composition of absorption);
- output-switching (the change in the composition of output); and
- economic growth ( the change in total real output).

For this purpose, the paper makes use of the decomposition procedure developed by Jaspersen (1981), using the theoretical insights of the well-known Salter (1959) model of internal and external balance. The procedure is explained in section 2; the results for

Malaysia are presented in section 3; and section 4 provides an analysis of these results. Section 5 is a brief concluding summary.

#### 2. DECOMPOSITION PROCEDURE<sup>1</sup>

In accordance with basic national accounting principles, the real resource balance may be defined as the difference between real output and real absorption. Thus:

$$\mathbf{B} = \mathbf{Y} - \mathbf{A} \tag{1}$$

where B is the resource balance, Y is output (gross domestic product), and A is absorption (total private and public consumption and investment), all measured in constant prices.

Jaspersen follows Salter in assuming that both output and absorption are separable into tradable and non-tradable products. Tradable products consist of exportables and importables. The excess of the output of exportables over their absorption forms exports, while the excess of the absorption of importables over their output forms imports. The domestic prices of tradables are directly influenced, if not totally determined, by world markets and the exchange rate. Non-tradable products, as their name suggests, do not enter into international trade. The prices of non-tradables are determined only by domestic market conditions.

Given the tradable/non-tradable distinction, the real resource balance can be defined alternatively to (1) as the excess of output of tradables  $(Y^T)$  over absorption of tradables  $(A^T)$ :

$$B = Y^{T} - A^{T}$$
<sup>(2)</sup>

 $Y^{T}$  is assumed to be determined independently of  $A^{T}$ , and is thus unresponsive to changes in  $A^{T}$ . This procedure is consistent with the Salter model which treats the economy as a price-taker on world markets.

The tradable/non-tradable distinction also means that, *ex post*, output of non-tradables  $(Y^N)$  is always equal to absorption of non-tradables  $(A^N)$ :

<sup>&</sup>lt;sup>1</sup>This section follows closely the exposition of the Jaspersen methodology found in Treadgold and Treadgold (1992). See also Chowdhury (1993).

$$Y^{N} = A^{N} \tag{3}$$

It is assumed that equality occurs as a result of  $Y^N$  always adjusting fully to  $A^N$ . In other words, output of non-tradables is assumed to be demand-determined.

Using this framework, the change in the real resource balance between any two periods, t and t + n, can be separated into four components. The first is the absorption effect. This refers to that part of the change in the real resource balance between the two periods that results from a change in the level of total absorption, assuming no variation in the relative tradable/non-tradable composition of absorption. It is measured as the negative of the proportionate change in total absorption multiplied by the level of absorption of tradables in the earlier period. (Given (2) above, absorption of tradables in the earlier period.) Thus:

$$\Delta B^a = -(h-1)(Y^T_t - B_t)$$
<sup>(4)</sup>

where  $\Delta B^a$  is the absorption effect, h is the ratio of total absorption in period t + n to total absorption in period t, and  $(Y^T_t - B_t)$  is absorption of tradables in period t.

The second component is the expenditure-switching effect ( $\Delta B^{es}$ ). It is defined as that part of the change in the real resource balance that results from a shift in the composition of total absorption between tradables and non-tradables. It is measured as actual absorption of non-tradables in period t + n (equal, by assumption, to non-tradable output in that period) less the absorption of non-tradables that would have occurred in period t + n if non-tradable absorption had changed in the same proportion from period t as total absorption. Thus:

$$\Delta B^{es} = Y^{N}_{t+n} - hY^{N}_{t}$$
<sup>(5)</sup>

The third component is the output-switching effect ( $\Delta B^{os}$ ). It is defined as that part of the change in the real resource balance that results from a shift in the composition of total output between tradables and non-tradables. It is measured as the actual level of tradable output in period t + n less the level of tradable output that would have occurred in period t + n if it had changed from period t in the same proportion as total output. Thus:

$$\Delta B^{\rm os} = Y^{\rm T}_{\rm t+n} - kY^{\rm T}_{\rm t} \tag{6}$$

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where k is the ratio of total output in period t + n to total output in period t.

The fourth component is the growth effect ( $\Delta B^g$ ). It is defined as that part of the change in the real resource balance that results from a change in the level of total output, assuming no variation in the relative tradable/non-tradable composition of total output. It is measured as the proportionate change in total output between periods t and t + n multiplied by the level of tradable output in period t. Thus:

$$\Delta B^{g} = (k-1) Y^{T}_{t} \tag{7}$$

The total change in the real resource balance is necessarily equal to the sum of the above four components. Thus:

$$\Delta \mathbf{B} = \Delta \mathbf{B}^{\mathbf{a}} + \Delta \mathbf{B}^{\mathbf{es}} + \Delta \mathbf{B}^{\mathbf{os}} + \Delta \mathbf{B}^{\mathbf{g}} \tag{8}$$

where  $\Delta B$  is the total change in the real resource balance between periods t and t + n. A formal proof is found in Treadgold and Treadgold (1992).

Jaspersen takes the decomposition procedure one step further by separating the absorption effect into the changes in the real resource balance that result from the income effect of the change in the terms of trade ( $\Delta B^{a1}$ ), the income effect of the change in real output ( $\Delta B^{a2}$ ), and a residual demand-management policy effect ( $\Delta B^{a3}$ ). Underlying this step is the bold assumption that, in the absence of policy intervention, total absorption would change in the same proportion as real income, defined as real output adjusted for the movement in the terms of trade. This assumption enables the three sub-components of the absorption effect to be measured as:

$$\Delta B^{a1} = -x \left( Y^{T}_{t} - B_{t} \right) \tag{9}$$

$$\Delta B^{a2} = -y \left( Y^T_t - B_t \right) \tag{10}$$

$$\Delta B^{a3} = -(h-1-x-y)(Y^{T}_{t} - B_{t})$$
(11)

where x is that part of the change in real income between periods t and t + n attributable to the change in the terms of trade, expressed as a proportion of real income in t; and y is that part of the change in real income between t and t + n attributable to the change in real output (Y) between these periods, also expressed as a proportion of real income in t.

#### 3. RESULTS

The data used in applying the Jaspersen decomposition technique to Malaysia are taken from that country's national accounts for 1982-1987 (United Nations 1992). Real GDP originating in the activities of agriculture, hunting, forestry and fishing, mining and quarrying, and manufacturing is treated as tradable output. The rest of real GDP is treated as non-tradable.

This classification of output follows that used in previous decomposition studies (Jaspersen 1981, Treadgold and Treadgold 1992, Chowdhury 1993). It is, however, no more than a crude, if unavoidable, approximation. The tradable/non-tradable division is a valuable theoretical distinction, but in practice its application is handicapped by the difficulty of drawing an exact dividing line. For example, problems of classification arise where the output of domestic import-competing industries is only imperfectly substitutable for imports, and where the international tradability of some commodities is constrained by government regulation. In addition, even where a dividing line can be drawn, the available data on real GDP by kind of economic activity (industry of origin) often combine tradable and non-tradable forms of output under the one activity heading. Official balance of payments figures suggest, for example, that Malaysia is a not insignificant producer of tradable services, but their contribution to GDP is hidden in a range of activities that appear to consist mainly of non-tradable services.

The results of the decomposition of changes in Malaysia's real resource balance are distorted to an unknown extent by these taxonomic difficulties. Moreover, there may be other distortions arising from the assumptions made about the determination of output levels for tradables and non-tradables, and the behaviour of total absorption in the absence of policy intervention. These caveats should be borne in mind when examining table 1. The first column shows the estimated sources of change in the real resource balance of Malaysia between 1982 and 1987 in millions of 1978 ringgit; the second column expresses these estimates as percentages of 1982 GDP at 1978 prices; and the third column expresses the estimates as percentages of the total change in the real resource balance between 1982 and 1987.

	Million ringgit at 1978 prices	Per cent of 1982 GDP at 1978 prices	Per cent of change in real resource balance <sup>a</sup>
Absorption effect	2066	4.1	14.5
terms of trade effect	795	1.6	5.6
change in output effect	-6145	-12.2	-43.2
policy effect	7416	14.7	52.2
Expenditure-switching effect	4469	8.9	31.4
Output-switching effect	2374	4.7	16.7
Growth effect	5303	10.5	37.3
Change in real resource balance	14212	28.2	100.0

# TABLE 1: DECOMPOSITION OF CHANGE IN REAL RESOURCE BALANCE,1982-1987

<sup>a</sup>Discrepancies between sums of items and totals are due to rounding.

It can be seen that between 1982 and 1987 the real resource balance increased by M\$14,212 million in 1978 prices. All four major sources of change in the real resource balance made positive contributions to this increase. The largest was the growth effect which contributed 37.3 per cent of the increase. Second largest was the expenditure-switching effect which contributed 31.4 per cent. The contributions of the output-switching and absorption effects were both much smaller at 16.7 and 14.5 per cent respectively. Underlying the comparatively minor contribution of the absorption effect were, however, much larger changes in some of its sub-components. The boost given to real income, and hence to absorption, by the increase in output between 1982 and 1987 had a large negative effect on the real resource balance. This far outweighed the positive contribution arising from the impact on real income of a small decline in the terms of trade, but was itself swamped by a very substantial positive policy effect. The effect of policy in restraining absorption is estimated to have alone accounted for 52.2 per cent of the increase in the real resource balance.

More broadly, the results suggest that demand and supply-side forces shared responsibility for the improvement in the real resource balance roughly equally. In a total improvement equivalent to 28.2 per cent of 1982 real GDP, demand-side forces in the form of absorption and expenditure-switching effects contributed 13.0 percentage points and supply-side forces in the form of output-switching and growth effects contributed 15.2 percentage points.

#### 4. ANALYSIS

This section seeks to identify some of the more important factors that have influenced the magnitudes of the four effects or components of the change in the real resource balance estimated in table 1.

#### **4.1 ABSORPTION EFFECT**

The absorption effect focuses on the change in the real resource balance arising from the change in the level of aggregate domestic demand. Its positive value for 1982-1987 reflects a fall in real absorption. All of this fall occurred after 1984. Between 1982 and 1984 absorption measured in 1978 prices grew strongly from M\$54.3 billion to M\$59.4 billion. But with the onset of domestic recession in 1985 it declined sharply to M\$55.3 billion, and by 1986 it was down to M\$50.2 billion. Only in 1987 did it start to increase again, and then to only M\$50.5 billion, still a net 7.0 per cent below its 1982 level. This net fall was entirely the result of a decline in gross capital formation. Private and government final consumption expenditure at constant prices were at much the same levels in 1987 as they had been in 1982.

Further insights into the absorption effect are obtained from its separation into terms-of-trade, change-in-output and policy effects. The method of separation is crude, but its empirical results possess a broad plausibility. In particular, the very substantial positive contribution from the policy effect between 1982 and 1987 fits comfortably with independent evidence on the tightening (i.e. absorption-reducing nature) of Malaysian fiscal and monetary policies over this period.

At the start of the 1980s the stance of fiscal policy had been strongly expansionary. Between 1979 and 1981 the budget deficit of the federal government increased from M\$3.7 billion or 7.9 per cent of GDP to M\$11.0 billion or 19.1 per cent of GDP. A reversal of this stance began in 1982 when the deficit was virtually stabilised in money terms, while falling in relative terms to 17.8 per cent of GDP. Over the next three years fiscal policy was progressively tightened, with the budget deficit shrinking continuously to M\$5.7 billion or 7.4 per cent of GDP in 1985. A recession in that year led to some softening of fiscal austerity in 1986 when a combination of modest growth in expenditure and a fall in revenue resulted in a widening of the deficit to M\$7.5 billion or 10.5 per cent of GDP. However, fiscal policy was re-tightened in 1987 when, despite another fall in government revenue, the deficit was cut back to M\$6.2 billion or 7.7 per cent of GDP.

Taking the period 1982-1987 as a whole, the contribution of fiscal policy to restricting absorption occurred overwhelmingly on the outlays side of the budget. Revenue as a proportion of GDP actually declined from 26.7 per cent to 22.8 per cent, but this decline was far outweighed by a decline in outlays (including lending minus repayments) as a proportion of GDP. These fell from 44.5 per cent to 30.5 per cent.

Like fiscal policy, monetary policy in the period under examination became more restrictive. It, too, had been strongly expansionary at the beginning of the 1980s, permitting a 2.6 fold growth in the outstanding domestic credit of the monetary system between the end of 1979 and the end of 1982. This was equivalent to an average annual (compound) rate of increase of 38.1 per cent. However, by 1983 the annual rate of increase was down to 16.1 per cent, and over the full five years 1982-1987 it averaged only 10.5 per cent.

The slowdown in credit expansion was mirrored in the behaviour of interest rates. Real interest rates on bank lending had been negative in 1981. By the following year the real modal base lending rate was averaging close to 3 per cent. From there, it rose to about 7 per cent in 1983 and 1984, before peaking at over 11 per cent in 1985. In 1987 it was still nearly 8 per cent.<sup>2</sup>

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<sup>&</sup>lt;sup>2</sup>Real interest rates have been estimated in the conventional manner by adjusting nominal interest rates for the actual rate of inflation over the preceding year, as measured by the consumer price index This procedure can be criticised, of course, for its implicit assumption that expectations of inflation are based on the recent behaviour of the price level. Data are taken from International Monetary Fund (1992).

#### 4.2 EXPENDITURE-SWITCHING EFFECT

This effect refers to the change in the real resource balance arising from the change in the composition of aggregate domestic demand between tradables and non-tradables. Its positive value for 1982-1987 of M\$4,469 million at 1978 prices, equivalent to 8.9 per cent of 1982 real GDP, indicates a substantial shift in composition away from tradables towards non-tradables.

In the Salter model positive expenditure-switching is induced by an increase in the ratio of tradable to non-tradables prices. In principle, an index of this relative price ratio could be constructed from the implicit price deflators for the tradable and nontradable components of GDP, as defined for the purposes of this study. In practice, estimation of these deflators requires data on GDP by kind of economic activity in both current and constant prices; and unfortunately, the Malaysian national accounts do not include the required current price data for the period under examination. It is therefore necessary to rely on alternative evidence of the behaviour of tradable/non-tradable relative price movements.

The best available proxies are provided by indexes constructed from the ratio of the implicit price deflator for exports to the GDP deflator and from the ratio of the implicit price deflator for imports to the GDP deflator. These indexes show net declines of 7.9 and 5.3 per cent respectively from 1982 to 1987, suggesting that there was a fall rather than an increase in the ratio of tradable to non-tradable prices over this period. The fall appears to have occurred despite a nominal effective devaluation of the ringgit amounting to a net 13.1 per cent (International Monetary Fund 1992), and presumably reflected more than offsetting falls in the foreign-currency prices of tradables.

Since it therefore appears that movement in the relative prices of tradables and non-tradables must be rejected as a factor contributing to the positive expenditureswitching that occurred, it is necessary to look for other explanations. One possibility is a combination of growth in real incomes and differences in aggregate incomeelasticities of demand (absorption) between non-tradables and tradables. Non-tradable activities, as identified in the decomposition procedure, correspond mainly to service industries, while tradable activities are confined to goods-producing industries. Because services normally display a higher income-elasticity of demand than goods, the growth in Malaysia real income experienced over the period 1982-1987 might be expected to have induced positive expenditure-switching despite relative price movements to the contrary. The difficulty with this explanation, however, is that it can really be applied only to the private and government consumption components of absorption. These, as already noted, showed little change between 1982 and 1987. Hence positive expenditure-switching could have been induced by the growth in real income only if the income-elasticities of private and government consumption demand for tradables had taken implausible negative values.

An alternative, more convincing explanation is found in the fact that the net fall of 7.0 per cent in total real absorption between 1982 and 1987 was entirely a reflection of a 23.2 per cent fall in real investment. In Malaysia, as in most developing countries, investment is likely to have had a relatively high import content compared with consumption. Hence its decline is likely to have had a powerful impact in shifting the relative composition of total absorption away from tradables towards non-tradables and thus bringing about positive expenditure-switching.

#### **4.3 OUTPUT-SWITCHING EFFECT**

Although the positive contribution of output-switching to the increase in the real resource balance over the period 1982-1987 was little more than half that of the expenditure-switching effect, it still mounted to 4.7 per cent of 1982 real GDP. It reflected a growth in tradable output that, despite the apparent decline in the prices of tradables relative to non-tradables, was significantly faster than the growth in total real GDP. In particular, tradable GDP grew at an average annual rate of 5.4 per cent compared with 3.9 per cent for total GDP.

The output-switching effect can be disaggregated very simply into the contributions of the three identified tradable sectors of agriculture, forestry, fishing and hunting, mining and quarrying, and manufacturing. Thus, decomposing equation (6) into these elements:

$$\Delta B^{os} = \Delta B^{osp} + \Delta B^{osq} + \Delta B^{osm}$$

$$= [Y_{t+n} - kY_{t}] + [Y_{t+n} - kY_{t}] + [Y_{t+n} - kY_{t}]$$
(12)

where the superscript p stands for agriculture, forestry, fishing and hunting, q for mining and quarrying, and m for manufacturing. Estimates for Malaysia for 1982-1987 are shown in table 2.

Sector	Million ringgit at 1978 prices	Per cent of 1982 GDP at 1978 prices	Per cent of total output switching effect
Agriculture, forestry, fishing and hunting	-530	-1.1	-22.3
Mining and quarrying	838	1.7	35.3
Manufacturing	2066	4.1	87.0
Total output-switching effect	2374	4.7	100.0

#### TABLE 2: DECOMPOSITION OF OUTPUT-SWITCHING, 1982-1987

These estimates reveal that the manufacturing sector dominated outputswitching. At 7.3 per cent, its average annual rate of growth of real value added was the fastest of the three tradable sectors; and the excess of this growth rate over that for the whole economy translated into a very substantial volume of output-switching because already in 1982 manufacturing accounted for close to 40 per cent of tradable real GDP. Industrial growth owed more to the expansion of exports of light, labourintensive manufactures, particularly electronic and electrical products, than to the process of import substitution. Underpinned by direct foreign investment attracted by low labour costs and tax incentives, manufactures accounted for 45 per cent of merchandise exports by 1987.<sup>3</sup>

At 6.8 per cent, the growth rate of the mining and quarrying sector was nearly as fast as that of manufacturing, but because real value added in mining and quarrying in 1982 was less than half that of manufacturing the contribution it made to positive

<sup>&</sup>lt;sup>3</sup>For a detailed analysis of industrialisation in Malaysia, see Jomo (1990), especially ch. 6.

output switching over the next five years was much smaller. The growth of the mining and quarrying sector, like that of manufacturing, was export-oriented, with the expansion of petroleum production and the emergence of natural gas production far outweighing a fall in the output of tin-in-concentrate. The growth occurred despite the collapse of oil prices after 1981 and later associated declines in the prices received for LNG exports. By 1987 production of crude petroleum was 64 per cent above its 1982 level, and had been even higher in 1986.

The agricultural sector (inclusive of forestry, fishing and hunting) was the only identified tradable sector to grow more slowly than the economy as a whole over the period 1982-1987. Its average annual growth rate of 3.0 per cent meant that it made a negative contribution to output-switching that dampened somewhat the positive contributions of manufacturing and mining. Output of padi, the major importable food crop, fell in total by nearly 10 per cent, reflecting a declining area under cultivation and stagnant yields. Production of the traditional staple export commodity of rubber achieved an average annual growth rate of little more than one per cent, and that for sawlog production was less than two per cent, although palm oil production increased at a more respectable annual rate of 5.2 per cent. Prices of these exportables were subject to considerable instability, with each displaying some tendency to move adversely relative to the general level of prices over the period 1982-1987 as a whole.

#### 4.4 GROWTH EFFECT

The original Salter model does not allow for the growth effect. It assumes a fixed set of production possibilities determined by given factor endowments and a given state of technical knowledge. In principle, the growth effect can be viewed as allowing for the impact that expansion in the set of production possibilities would have on the real resource balance in the absence of change in the tradable/non-tradable pattern of resource allocation. As measured in practice, however, the growth effect is dependent on the growth of actual total output, not the expansion of production possibilities. Thus, given the scale of tradable production in 1982, the positive contribution made by the growth effect to the increase in Malaysia's real resource balance over the period 1982-1987 is a direct reflection of the net 20.6 per cent growth in real GDP between these years.

Although the contribution of the growth effect was equivalent to as much as 10.5 per cent of 1982 real GDP, the growth performance itself was modest by recent historical standards. The average annual rate of growth of 3.9 per cent was not much more than half the 7.3 per cent rate achieved over the immediately preceding five-year

period 1977-1982. It also embodied considerable instability. Following successive growth rates of 6.0, 6.2 and 7.8 per cent between 1982 and 1985, real GDP actually fell by 1.1 per cent in the recession of 1985. Then, in the initial phase of the recovery in 1986 it grew by only the same percentage rate, although by 1987 the growth rate had climbed back to 5.4 per cent.

While the instability undoubtedly owed much to fluctuations in aggregate demand, the theoretical underpinnings of the growth effect suggest that the growth performance for the period as a whole should be examined from the supply side. The Harrod-Domar approach provides one such perspective. It identifies the rate of investment (ratio of investment to GDP) and the incremental capital-output ratio (ICOR) as the immediate determinants of the growth of output. If investment is confined to fixed capital formation, and if a one-year gestation lag is assumed between investment and its effect on productive capacity and hence output, rough calculations suggest that the deterioration in growth performance from 1977-1982 to 1982-1987 was a reflection of a very large rise in the average value of the ICOR from about 3.9 to about 8.6. It more than offset the impact of an increase in the average rate of investment. (The increase in the average investment rate conceals the fact that after 1983 the annual rate of investment was in continuous and accelerating decline.) In other words, taking the two periods as a whole, growth performance worsened because of a decline in the productivity of additions to the capital stock.

An alternative supply-side perspective is provided by the basic neoclassical growth accounting approach. It divides the rate of growth of output into the contributions of the growth of capital and labour inputs plus a residual component attributable to the rate of increase of 'total factor productivity'. Application of the approach is beset by formidable conceptual and statistical problems, but rough 'broad brush' assumptions yield results which suggest that within the period 1982-1987 about 2.4 percentage points or some 62 per cent of the average annual growth rate of 3.9 per cent was attributable to growth in capital inputs, about 1.4 percentage points or 36 per cent of the growth rate was attributable to growth in labour inputs, and only 0.1 percentage points or 3 per cent of the growth rate was attributable to increases in total factor productivity.<sup>4</sup>

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<sup>&</sup>lt;sup>4</sup>These estimates are derived from the following assumptions: an average annual rate of increase of capital inputs equal to that of the physical capital stock (estimated at 6.0 per cent, using the further assumptions of an initial fixed capital-output ratio of 3.0 in 1981 and an annual depreciation rate of 5 per cent, together with annual data on real gross fixed investment); an average annual rate of increase of labour inputs equal to the estimated rate for total employment (2.3 per cent); and elasticities of output with respect to capital and labour of 0.4 and 0.6 respectively.

The dominant contribution of capital is broadly consistent with evidence from a similar study by Fry (1991: 17-19) for the slightly longer period 1982-1988. Moreover, his results include an estimate of the contribution from total factor productivity that is actually negative.<sup>5</sup> However, the results of both studies may be subject to some distortion because of the possibility that, following the recession of 1985, the Malaysian economy was still experiencing considerable excess productive capacity in 1987 and even as late as 1988, Given the use of the capital stock as a proxy for capital inputs in both studies, the existence of excess capacity in these years would have served to exaggerate the contribution of growth in capital inputs with a corresponding underestimation of the role of total factor productivity. Relatedly, in terms of the alternative Harrod-Domar approach, this excess capacity would have served to exaggerate the increase in the ICOR, interpreted as the amount of physical capital required to produce an additional unit of output.

#### 5. CONCLUSION

This paper has used a decomposition methodology to divide the very large improvement that occurred in Malaysia's real resource balance between 1982 and 1987 into the contributions made by absorption, expenditure-switching, output-switching and growth effects. Estimates of these four effects indicate that they all made positive contributions to the improvement. The absorption effect accounted for a net 15 per cent of the total increase in the real resource balance, the expenditure-switching effect for 31 per cent, the output-switching effect for 17 per cent, and the growth effect for 37 per cent.

Further decomposition separating the absorption effect into sub-components attributable to the income effect of a decline in the terms of trade, the income effect of an expansion of real output, and the effect of demand management policy suggests that the last of these played a major role in reducing absorption and thereby improving the real resource balance. This finding is consistent with independent evidence of the tightening of Malaysian fiscal and monetary policies over the period 1982-1987.

The positive expenditure-switching and output-switching effects occurred despite indications of a decline in the prices of tradables relative to non-tradables. The expenditure-switching effect appears to have reflected the fact that the reduction in absorption was entirely the result of a fall in investment. Given that investment is

<sup>&</sup>lt;sup>5</sup>They also show a negative contribution from labour force growth, but this seems to be a typographical error.

likely to have had a relatively high import content, this fall meant a shift in the relative composition of absorption away from tradables towards non-tradables. In the case of output-switching, disaggregation reveals that its positive contribution to the improvement in the real resource balance was dominated by the performance of the manufacturing sector. Finally, notwithstanding the fall in investment, conventional growth accounting analysis suggest that growth in the capital stock was the factor principally responsible for the large positive contribution of the growth effect.

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