
STRUCTURAL CHANGE IN THE 1980S

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I. Introduction

During the 1980s Malaysia began a process of remarkable structural change which has continued into the 1990s. This change is reflected in the latest Economic Report from the Treasury (1990/1991) which forecasts that the manufacturing industry's share of GDP, currently standing at 27.8%, will eventually overtake the sum of the shares (27.7%) of agriculture/livestock/forestry/fishing and mining/quarrying.

In 1980 the gap was much wider with the manufacturing industry accounting for 20% of GDP while the others stood at 33% - almost one third of GDP.

The rapid growth of exports within the manufacturing industry is another indication of this change. In 1980 manufactured goods occupied 22% of total exports. However, steady annual rises of between 20-30%, except in 1981 and 1985, meant they started the 1990s with a 60% share of the export market.

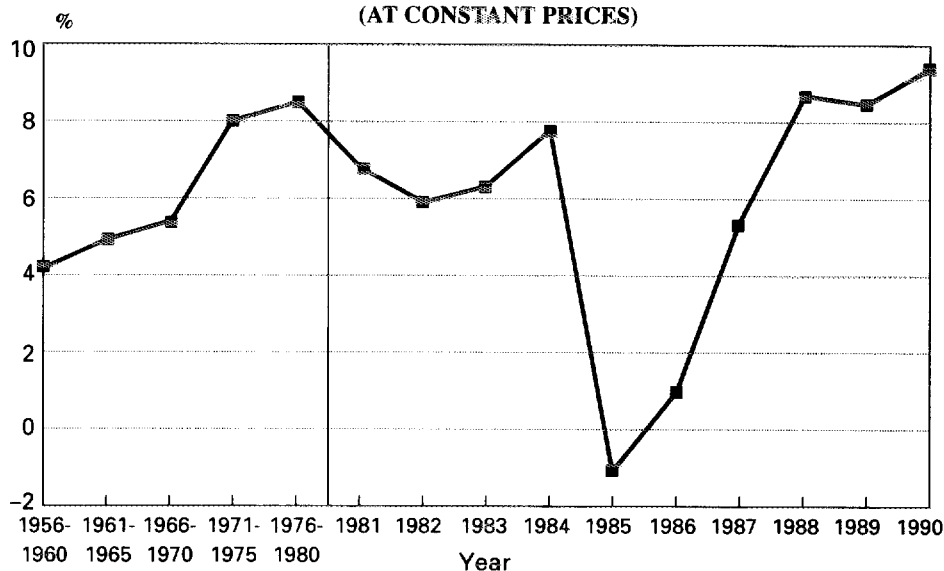
Recent development in the rubber industry also highlight this change and are of symbolic significance to resource abundant Malaysia. Although the Government's revenue from rubber has decreased to a marginal level, the Treasury still went ahead with its proposed abolition of export duty for this commodity.

Ever since Independence, Malaysia has depended on rubber to boost its export earnings as well as for the amount of revenue it generated for the Government. Now however, the emphasis has switched to the manufacturing sector and the exportation of manufacturing goods. Despite the growth in the manufacturing industries, the primary sector continues to dominate substantial parts of the economy; accounting for almost 30% of the country's value added and employment and around 40% of export earnings.

The 1980s also saw rapid structural change in the Malaysian economy as the country entered into a transitional period on its way to achieving status as a newly industrialised country.

The following chapter outlines some of the characteristics of this period of change with regard to supply and demand as it is possible the Malaysian experience may be a useful reference for other developing countries.

FIGURE 1
ANNUAL GROWTH RATE OF GDP
(AT CONSTANT PRICES)



Source: Ministry of Finance, *Economic Report*, Bank Negara Malaysia, *Money and Banking in Malaysia, 1959-1989*

II. Structural Change Since Independence

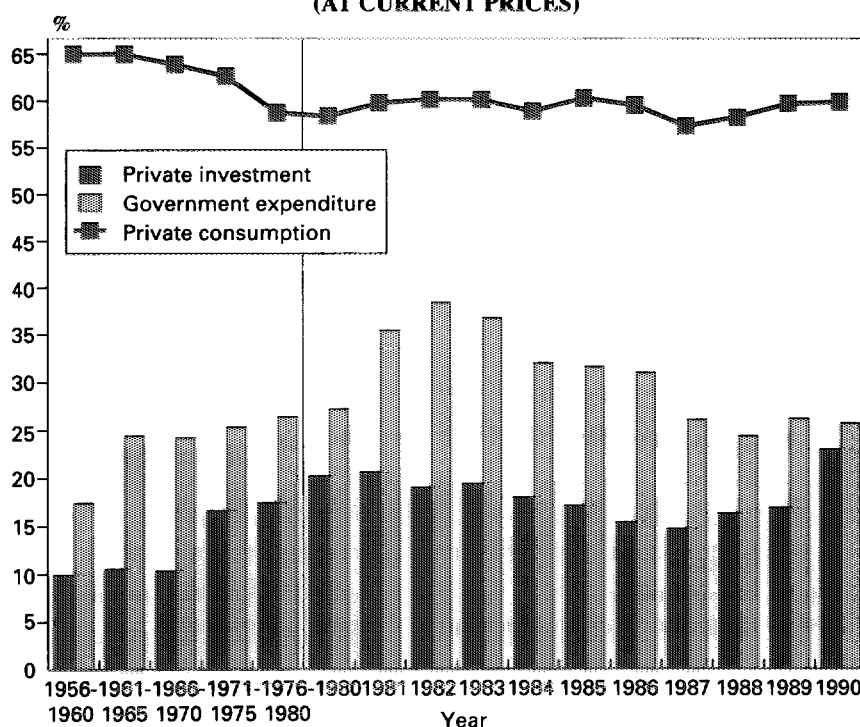
Before going into details, let us first look at how Malaysia has performed since Independence in 1957.

Figure 1 shows the five year averages of growth rate of real GDP up to 1980 and the annual growth rate of real GDP during the 1980s. As can be seen, the growth rate initially accelerated immediately after Independence, slackened in the middle of the 1980s and recovered in the latter part of the decade. This increasing tendency in GDP growth rate stimulated private investment so that it contributed a higher share in expenditure of GDP as shown in Figure 2.

Public Expenditure; the sum of Public Consumption and Public Investment, contributed relatively higher than in other countries and was exceptionally high in the early part of the 1980s.

On the supply side; Figure 3 shows the relative composition of each industry in GDP. Apparently the share of the agriculture/forestry/fishing sector has been drastically decreasing. It eventually stabilized at around 20% after 1980. On the other hand, the manufacturing sector has been steadily increasing and it was forecast it would overtake the sum of the former plus mining/quarrying in 1991. In other words, Malaysia's leading industries switched from those which were primary-based to those involved in manufacturing. Figure 4 illustrates this change from a different viewpoint. The major primary commodities have been replaced by manufactured exports as the leading export earner. However, it should be noted

FIGURE 2
SHARE IN EXPENDITURE OF GDP
(AT CURRENT PRICES)



Source: Ministry of Finance, *Economic Report*, Bank Negara Malaysia, *Money and Banking in Malaysia, 1959-1989*

that those primary commodities, except tin, have continued to contribute a substantial part of exports (30-40%).

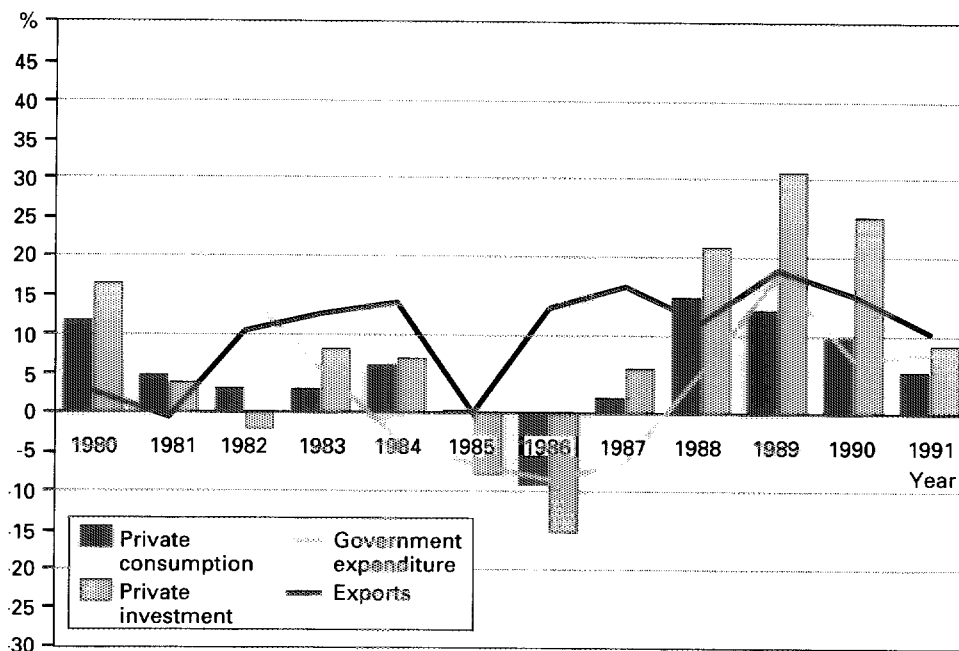
In a similar way the 1980s also witnessed a rapid change in the industrial structure of the Malaysian economy from both the demand and supply viewpoints.

III. Structural Change in Demand

The previous section points out that domestic investment has been the engine powering the accelerated growth of demand structure. Public Expenditure has also played an important role. This is a general tendency of any rapidly growing economy. But, if we plot the growth rates of each demand-composing item, as in Figure 5, then we can see the changing roles of each during the 1980s.¹

Figure 5 also shows that in the beginning of the 1980s the most rapid growth occurred through Public Expenditure. However, by the middle of the decade Public Expenditure slowed down and exports assumed the leading role. In fact, from 1983 through to 1987, the export growth rate was higher than any other demand com-

FIGURE 5
ANNUAL GROWTH RATE OF DEMAND COMPONENT

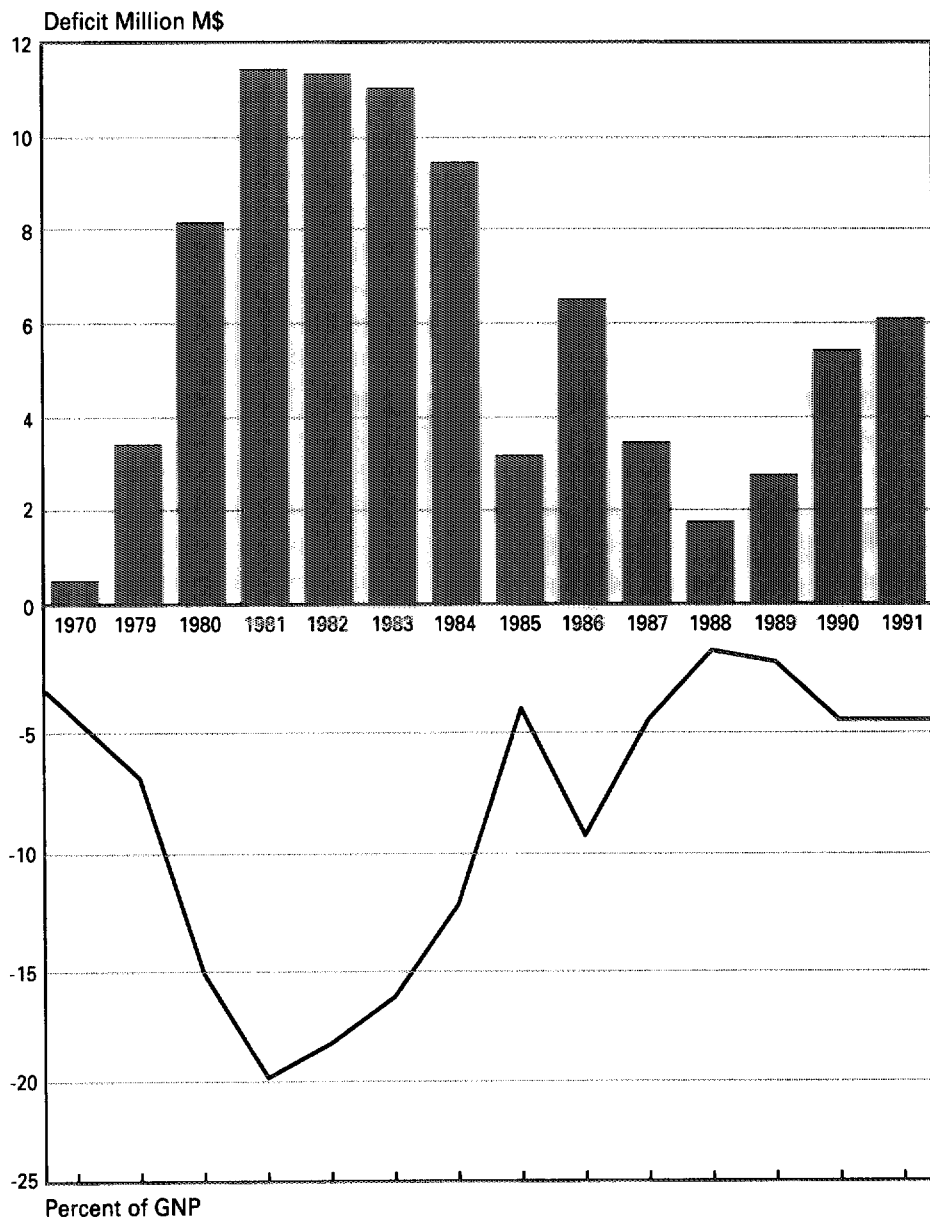


ponent. In 1985, when the Malaysian economy first experienced negative growth, exports still managed to maintain positive growth even though it was less than one percent. After the export-led economy picked up in 1987, Private Investment became very important working with Private Consumption to power the economy through this phase. Public Expenditure also increased but with a much slower rate than it enjoyed at the beginning of the 1980s. In other words, Public Expenditure has not led the economy but rather has accommodated the private sector's activity.

There were also many behind-the-scenes changes with regard to the role of demand components. Changes in the environment, the international economy and the political climate as well as changes within social institutions have all been contributing factors. At the beginning of the 1980s, the world economy was in recession sparked by the second oil crisis of 1979. In an attempt to tackle these world changes, the Government introduced a counter cyclical fiscal intervention policy which aimed at encouraging more Bumiputeras to participate in business and industrial activities. As a result of this massive intervention, the Government later faced financial burdens which in turn led to adjustment or austerity programmes (see Figure 6).

To compound this, the Government also faced severe cutbacks and the exchange rate, which had been overvalued since 1981, suddenly depreciated in 1984 (see Figure 7)². The depreciated ringgit generated downward pressure to the

FIGURE 6
CONSOLIDATED PUBLIC DEFICIT

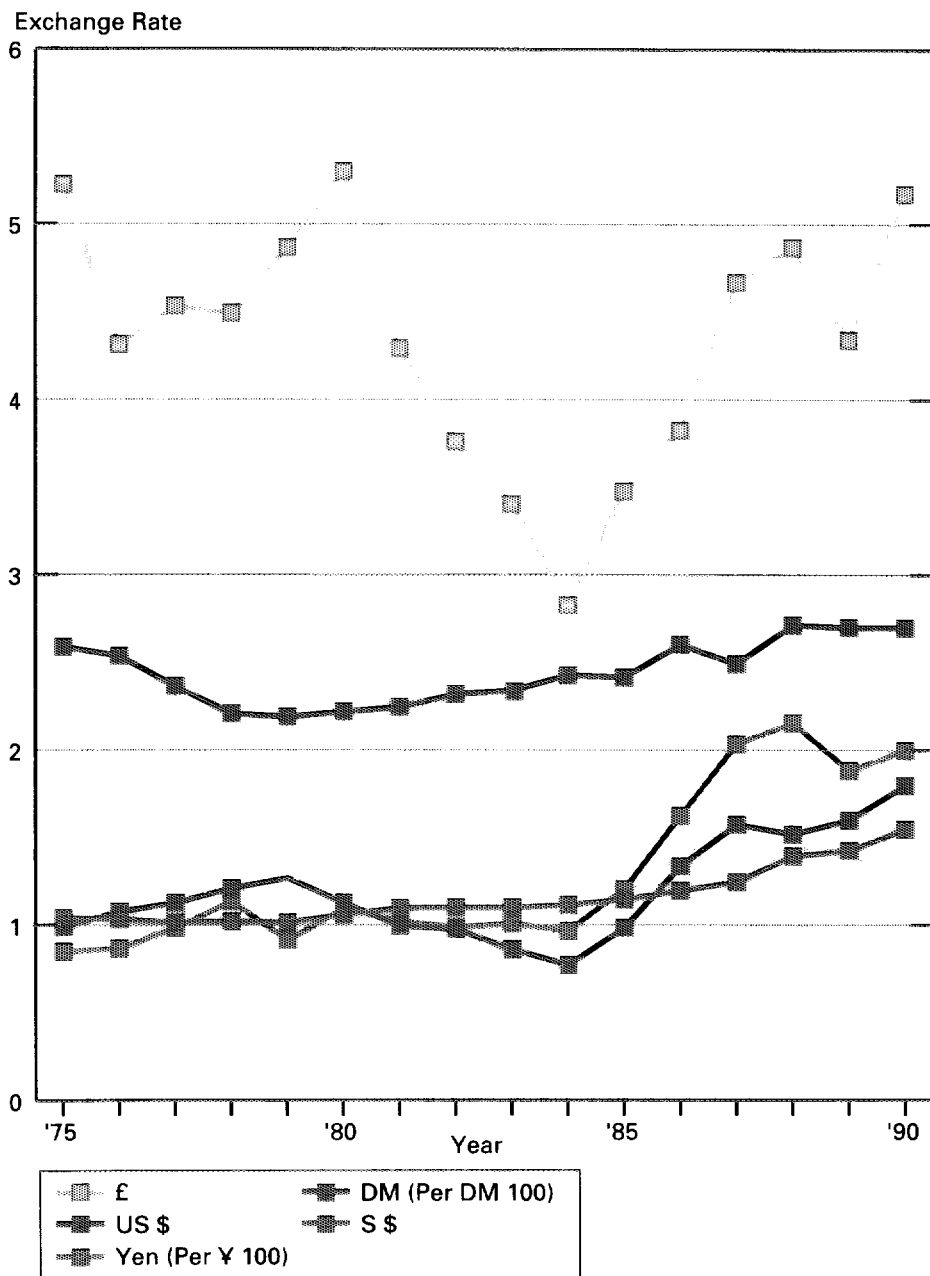


Source: Ministry of Finance, *Economic Report*, Bank Negara Malaysia, *Money and Banking in Malaysia, 1959-1989*

Note : Consolidated public account covers Federal/State/Local Government, Statutory Authorities and Non-financial Public Enterprises.

terms of trade followed by a lowering of export prices for the major commodities. This decline in terms of trade, discounted the national income and shrunk the demand in the Private Consumption and Investment sectors. Note that the

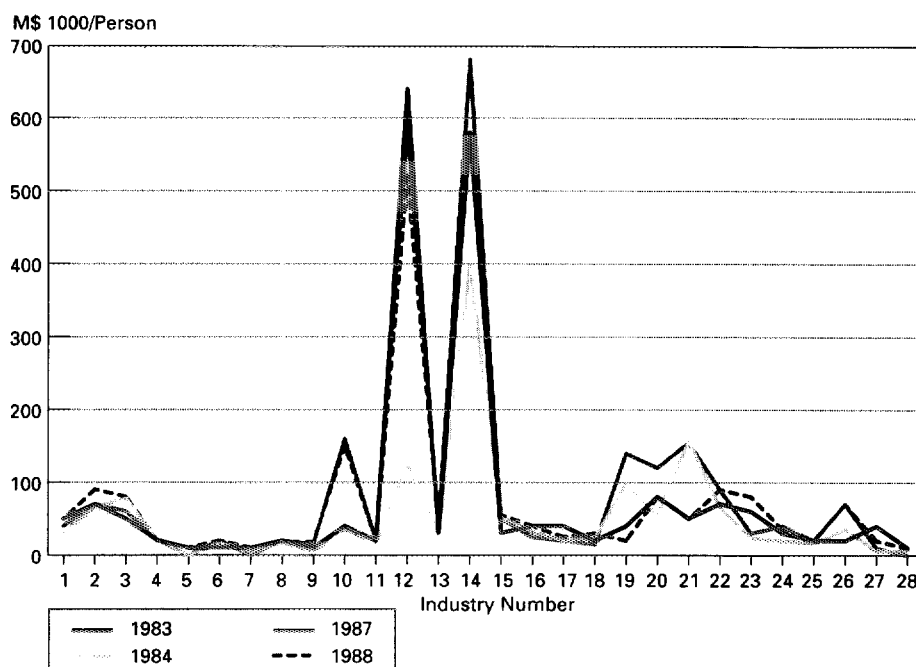
FIGURE 7
EXCHANGE RATE OF RINGGIT AGAINST SELECTED CURRENCIES



Source : Bank Negara Malaysia, *Annual Report 1990*, p. 284

Government had to restrain its expenditure. The negative growth of 1985 could not be escaped even though the growth rates of OECD countries had been recovering since 1983 and had been kept at a moderate level. The experiences of

FIGURE 8
K/L RATIO



this vulnerability to the external environment made the Government soften regulations on the inflow of foreign direct investments and gave them many favourable incentives in 1986. These incentives coupled with the 1985 global realignment of exchange rates against the US\$ and the depreciated ringgit led to a boom in direct foreign investment in Malaysia. This generated employment opportunities and stimulated domestic demand. This increased flow in direct foreign investment was directly responsible for stimulating Private Investment. This regained confidence within the economy after experiencing negative growth in 1985 and 1986. Private Consumption also picked up to reach the 1980 level of growth. However, the Government continued to restrain expenditure, keeping to the austerity level right up to the beginning of 1990 and concentrated on implementing projects which were designed to ease the congested social infrastructure.

To sum up, the rapid growth of the 1980s can be characterized by three different phases of the major leading demand component. The beginning was dominated by Government Expenditure, the middle of the decade by Exports and the later part of the 1980s by Private Expenditure.

IV. Structural Change in Production

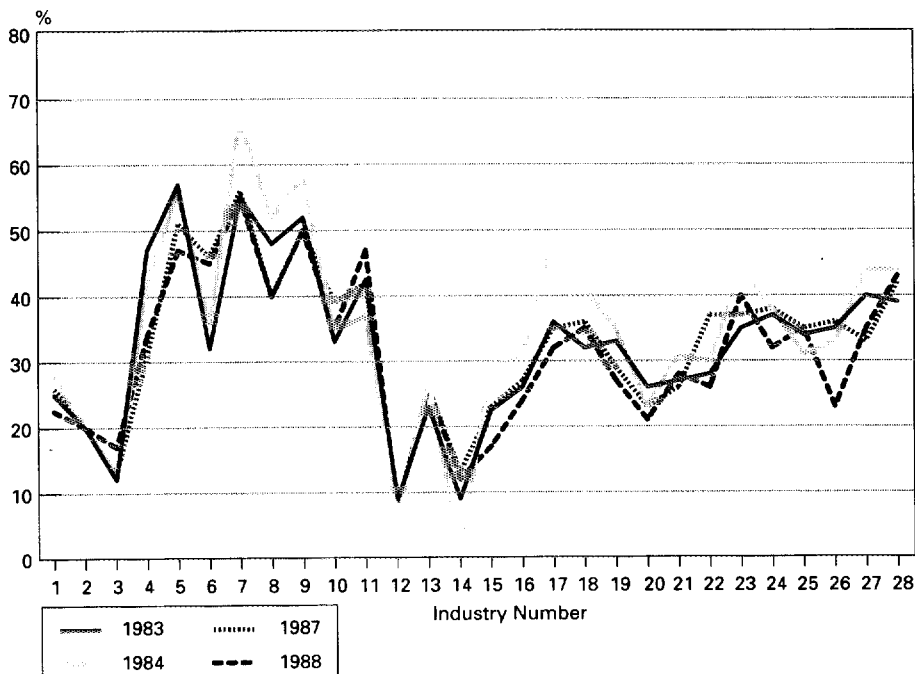
The earlier sections suggest that because of the rapid change in demand structure

and the emerging importance of Private Investment, together with a massive inflow of foreign direct investment there have also been some structural changes on the supply side. This section tests this hypothesis and attempts to determine whether there was any structural change on the supply side especially within the manufacturing sector during the 1980s.

In order to test the hypothesis, a production function has been estimated for the Malaysian manufacturing sector. The supply side of this sector is described as a production function over a cross section of the manufacturing industry. Suppose there is an annual production function for the manufacturing sector, its structural change would be seen in the estimated parameters. If there was any structural change in the sector then the production elasticities would be estimated differently for each year.

The data used for the estimation was obtained from the Department Of Statistics's Industrial Survey. This survey covers 93% of the output, 90% of the value added and 85% of the total employment of the manufacturing sector³. Before 1982 the base year for the survey was set out at 1973 utilising figures attained from the 1973 census. Since 1983 the survey has been updated and is now based on the 1981 census figures. The latest survey which is available was published in November 1990 and uses figures from 1988. It is therefore possible to use a whole range of data from 1983 through to 1988. As discussed earlier, the mid 1980s are not good for analysis because of the negative/sluggish growth during

FIGURE 9
LABOUR'S SHARE



this period. Data for the following analysis are given in the appendix.

Figures 8 and 9 show the capital labour ratio and labour share in the manufacturing sector respectively (note that the horizontal axis refers to the industry number). Interestingly enough, most of the industries are stable and are distributed within certain levels of these important economic variables throughout the years shown. It would appear that there are some exceptionally higher capital intensive industries, namely; Industrial Chemicals and Petroleum Refineries. The former includes the LNG or LPG industry in Sarawak. Another observation taken from these figures is that the average levels of the capital labour ratio and labour share increased towards the late 1980s. Most of the manufacturing industries deepened their capital intensity, while their labour share increased. Remember, that when a production function is homogenous by one degree, and each factor is paid by its marginal product, then each factor share remains constant to its production elasticity. This observation suggests some structural change was experienced by the Malaysian manufacturing industries during the 1980s.

The production function estimated is the one conventionally used in literature as follows:

$$Y = A K^{\alpha} L^{\beta} \quad (1)$$

where Y , K , and L indicate value added, capital and labour respectively. The production elasticity of capital and labour are α and β respectively, while A is a constant.

Production Elasticity

The results estimated by the ordinary least squares are summarized in Table 1 - A (the results for 1983 were not acceptable⁴) and Table 1 - B. In Table 1 - B we only cover non-capital intensive industries except for Industrial Chemicals and Petroleum Refineries.

The results show that (a) the annual production function is revealed to be mostly homogenous by one degree for each case, (b) the production elasticity of capital is significantly higher and labour lower when considering capital intensive

TABLE 1 - A
PRODUCTION ELASTICITY
(ALL 28 INDUSTRIES)

Year	Capital	Labour	Sum of Elasticity	R ²	S
1984	0.765(7.9)	0.281(2.7)	1.046	0.90	0.47
1987	0.608(7.9)	0.397(4.6)	1.005	0.91	0.45
1988	0.638(9.0)	0.338(4.2)	0.976	0.92	0.42

Note: T values are in parentheses. S is the standard error of the regression.

TABLE 1 - B
PRODUCTION ELASTICITY
(NON-CAPITAL INTENSIVE 26 INDUSTRIES)

Year	Capital	Labour	Sum of Elasticity	R ²	S
1983	0.659(6.8)	0.323(3.0)	0.982	0.95	0.34
1984	0.614(6.8)	0.438(4.4)	1.052	0.94	0.36
1987	0.488(5.2)	0.528(5.0)	1.016	0.91	0.44
1988	0.543(6.1)	0.440(4.4)	0.993	0.92	0.41

Note: T values are in parentheses. S is the standard error of the regression.

industries, (c) in the late 1980s, the production elasticity of capital is lower and that of labour higher than at the beginning of the decade.

(a) The sum of production elasticity for every year of the study are almost one. With or without the inclusion of capital intensive, the manufacturing industry, on the whole, has been keeping its property of constant returns to scale⁵. This is somewhat surprising since capital intensive industries are generally considered to have the property of increasing returns to scale. Rather, when excluding the capital intensive industries, the sum of the elasticities is higher than when they are included. The capital intensive industries only differ in their higher elasticity of capital and lower elasticity of labour from other industries.

(b) When capital intensive industries are included, the production elasticity of capital is estimated higher, and that of labour lower, than when these industries are excluded. This further means that the capital intensive industries have higher elasticity of capital and lower elasticity of labour than other industries. The fact that these industries are relatively new in Malaysia may have produced these results.

(c) The decrease of capital elasticity corresponds with the Japanese experience, although the speed of decrease for Malaysia is more rapid. It is often said that in Japan the production elasticity of capital has decreased from 0.8 in the prewar years (before 1940) to 0.5–0.6 in the 1950s and 1960s and 0.3–0.4 in the 1970s and 1980s. The production elasticity of labour was 0.2 in the prewar years moving to 0.5–0.6 in the 1950s and 1960s and 0.7–0.6 in the 1970s and 1980s. The tables above show the elasticity of capital for Malaysia decreased from 0.7–0.8 in the early 1980s to 0.5–0.6. For labour the figures show a move from 0.3–0.2 in the early 1980s to 0.5–0.4. The Malaysian manufacturing industries are all rapidly undergoing production structural changes in this way. However this gives them a lot of room to decrease capital elasticity by increasing labour elasticity through an increase in labour productivity.

Marginal Productivity

As we have the production function for each year we can quantify the marginal productivity of capital and labour. From the equation (1) the marginal productivities of each, MP_K and MP_L are calculated by :

$$MP_K = \alpha Y/K$$

$$MP_L = \beta Y/L$$

respectively.

Each column in Table 2 is evaluated at the average of the factor productivity (Y/K and Y/L) for all 28 industries and the 26 non-capital intensive industries. The figures in parentheses are evaluated at the average income (Y) divided by the average factor (K or L). The figures do not differ very much except that the latter are slightly lower.

Both sets of figures clearly indicate, however, that the marginal productivity of capital decreased in the late 1980s compared to the earlier figures, while labour increased substantially during the same period. An additional input of M\$1 worth of capital generated M\$0.548 (an average of 1983 and 1984 for non-capital intensive industries) income over a year in the early 1980s, while in the late 1980s it only generated M\$0.43. This indicates that during this time the manufacturing sector deepened its structure so much that it led to a decrease in the marginal productivity of capital.

On the other hand, however, labour increased its marginal productivity during the same period from M\$8,725 (the same average as above) to M\$14,200 for an additional input of labour. This is a substantial increase even though it should be slightly deflated to take into account the moderate inflation rate which was 1 to 3

TABLE - 2
MARGINAL PRODUCTIVITY OF CAPITAL AND LABOUR

	Capital (M\$/M\$1 Capital)		Labour (M\$1000/Person)	
	All 28 Industries	Non-capital Intensive 26 Industries	All 28 Industries	Non-capital Intensive 26 Industries
1983	—	0.612(0.526)	—	7.35(6.32)
1984	0.631(0.352)	0.484(0.451)	10.3(6.59)	10.1(8.75)
1987	0.475(0.352)	0.398(0.313)	16.7(10.2)	14.9(12.0)
1988	0.522(0.409)	0.462(0.374)	15.4(9.18)	13.5(10.6)

Note: Calculated from the production function for each year and evaluated at the average productivity. The figures in parentheses are evaluated at the average income divided by the average capital/labour.

percent a year at that time. It can be seen, therefore, that the Malaysian manufacturing industry has not yet reached the stage of experiencing the decreasing marginal productivity of labour. There remains much to be achieved in increasing the marginal product of labour.

V. Conclusion

In its development towards becoming an industrialized economy, the Malaysian economy has been remarkably successful in adjusting to the changes which occurred within the international and the social and political environment during the 1980s. In early 1980, when the world economy was in recession, the Government intervened and introduced counter cyclical measures which together with a Bumiputera policy, led it's economy through the recession period. When world economy picked up in the mid 1980s the sluggish Malaysian economy was sustained by exports while the Government was forced to restrain it's fiscal stance. After the "Plaza Accord" in 1985 the Government attracted foreign direct investments and began to deregulate/privatise in an effort to switch from a government dependent economy. With these policy changes the economy regained stability and by the end of the 1980s was led by Private Investment/Consumption. The engine for high growth during the 1980s switched from Government Expenditure to Exports and Private Expenditure.

During this process the manufacturing sector contributed a great deal, also from the supply side. As a result of the massive inflow of foreign direct investment coupled with stimulated domestic investment, the manufacturing sector rapidly changed it's production structure. The deepening of capital during this period was enough to decrease the manufacturing sector's production elasticity and marginal product of capital, while increasing the production elasticity and marginal product of labour. Manufacturing production is still going through the process of structural change and it is expected to lead to a further deepening of capital and an increase in labour productivity.

Notes

- (1) Contrary to the textbook understanding of the success stories of Korea and Taiwan, Imaoka (1985) or Amsden (1989) emphasise the important role played by the Government for both countries rapid growth of industrialisation.
- (2) Ota (1990) describes the adjustment process of the first half of the 1980s.
- (3) See Department of Statistics (1990), P. 37.
- (4) The result for 1983 was as follows:

$$\log Y = 0.127 + 1.86 \log K - 0.92 \log E$$

(12.4)
(- 6.2)

$$(R^2 = 0.95, S = 1.39)$$
- (5) Hoffmann (1980) estimated differently and found, "the majority of manufacturing industries in Malaysia operate under increasing returns to scale." This difference may come from their sample:
 - (a) the year covered was 1970
 - (b) only West Malaysia was covered
 - (c) the sample size was 2750 of total companies surveyed
 - (d) their production function is industry specific (ours covers the manufacturing sector as a whole).

References

1. Amsden, A.H. (1989), *Asia's Next Giant: South Korea and Late Industrialisation*, Oxford U.P., New York.
2. Department of Statistics (1990), *Industrial Surveys: Construction, Manufacturing, Mining and Stone Quarrying 1988*, Kuala Lumpur.
3. Hoffmann, L. and T.S. Ee (1980), *Industrial Growth, Employment and Foreign Investment in Peninsular Malaysia*, Oxford U.P., Petaling Jaya, Malaysia.
4. Imaoka, H., K. Ohno and H. Yokoyama (eds.) (1985), *Industrial Development of Middle-income Countries*, Institute Developing Economies, Tokyo (In Japanese).
5. Ota, K. (1990), "Slow Down of Growth and Economic Adjustment in Malaysia : The Effects of Sluggishness of Primary Commodity Prices in the 1980s," *Ajia Keizai*, 16(2) (In Japanese).

Appendix

TABLE A - 1
SURVEY DATA, MANUFACTURING, 1983

	VA (Thousand M\$)	Person (Person)	Capital (Thousand M\$)
1 Food	1474684	62407	2610453
2 Beverage	287234	5843	338830
3 Tobacco	383453	5457	219988
4 Textile	345668	33102	606310
5 Wearing Apparel	190021	27681	141633
6 Leather and Leather Products	7053	604	7520
7 Footwear	10472	1284	9047
8 Wood and Cork Products	770683	63571	1029990
9 Furniture and Fixtures	75054	8081	67852
10 Paper and Paper Products	112536	6643	209162
11 Printing and Publishing	434052	19750	332299
12 Industrial Chemicals	811483	5423	3385160
13 Other Chemical Products	370092	9828	274181
14 Petroleum Refineries	248609	917	519622
15 Miscellaneous of Petroleum and Coal	21059	657	16517
16 Rubber Products	734081	30079	834077
17 Plastic Products	195715	15126	281262
18 Pottery, China and Earthenware	29634	1921	57492
19 Glass and Glass Products	62762	2310	162051
20 Non-Metallic Mineral Products	583724	21880	1067540
21 Iron & Steel	329075	9950	657053
22 Non-Ferrous Metal	109881	3248	172632
23 Manufacture of Fabricated Metal	409360	21751	478130
24 Machinery	308906	14614	257823
25 Electrical Machinery	1614411	86974	1246471
26 Transport Equipment	502108	21136	665948
27 Scientific & Measuring & Controlling Equipment	76761	5604	55480
28 Other Manufacturing Industries	87701	7255	87188

Source : Department Of Statistics, *Industrial Survey : Construction, Manufacturing, Mining and Stone Quarrying 1983*, Kuala Lumpur

TABLE A - 2
SURVEY DATA, MANUFACTURING, 1984

	VA (Thousand M\$)	Person (Person)	Capital (Thousand M\$)
1 Food	2005524	61851	2690610
2 Beverage	284194	5935	384504
3 Tobacco	351503	3840	302301
4 Textile	419219	30986	606929
5 Wearing Apparel	235209	30943	176310
6 Leather and Leather Products	7132	569	8696
7 Footwear	8428	1283	9376
8 Wood and Cork Products	709345	60018	1073612
9 Furniture and Fixtures	80455	8624	86140
10 Paper and Paper Products	125096	6937	244021
11 Printing and Publishing	535098	21693	372714
12 Industrial Chemicals	1440374	5517	672594
13 Other Chemical Products	347598	9501	290862
14 Petroleum Refineries	232548	1395	553880
15 Miscellaneous of Petroleum and Coal	16700	690	34816
16 Rubber Products	662128	30000	880903
17 Plastic Products	186370	15584	318252
18 Pottery, China and Earthenware	26079	2041	53092
19 Glass and Glass Products	66267	2345	227212
20 Non-Metallic Mineral Products	743036	22812	1386755
21 Iron & Steel	302692	10958	1664297
22 Non-Ferrous Metal	109244	3148	203445
23 Manufacture of Fabricated Metal	357314	22388	524953
24 Machinery	314308	14444	323064
25 Electrical Machinery	2021434	93129	1644503
26 Transport Equipment	569389	20258	708401
27 Scientific & Measuring & Controlling Equipment	59112	4843	51700
28 Other Manufacturing Industries	85260	7156	92140

Source : Department Of Statistics, *Industrial Survey : Construction, Manufacturing, Mining and Stone Quarrying 1984*, Kuala Lumpur

TABLE A - 3
SURVEY DATA, MANUFACTURING, 1987

	VA (Thousand M\$)	Person (Person)	Capital (Thousand M\$)
1 Food	1797844	68620	3112123
2 Beverage	312806	5127	385384
3 Tobacco	535435	4263	278074
4 Textile	545333	28145	578611
5 Wearing Apparel	366630	39448	216889
6 Leather and Leather Products	5853	542	10115
7 Footwear	10110	873	10249
8 Wood and Cock Products	867399	56262	955511
9 Furniture and Fixtures	89952	9322	134922
10 Paper and paper Products	194242	8989	1453572
11 Printing and Publishing	440203	19333	407208
12 Industrial Chemicals	1537720	7137	4264319
13 Other Chemical Products	416801	9179	355787
14 Petroleum Refineries	260502	1125	763591
15 Miscellaneous of Petroleum and Coal	33183	881	43612
16 Rubber Products	899101	37503	971061
17 Plastic Products	277155	18138	84514
18 Pottery, China and Earthenware	52244	4547	69037
19 Glass and Glass Products	87320	2072	313128
20 Non-Metallic Mineral Products	650791	17489	2139424
21 Iron & Steel	433075	10653	1697971
22 Non-Ferrous Metal	71141	2705	247201
23 Manufacture of Fabricated Metal	369760	19209	535444
24 Machinery	330057	14474	505869
25 Electrical Machinery	2147285	100294	1951267
26 Transport Equipment	379932	14531	1065498
27 Scientific & Measuring & Controlling Equipment	106632	6283	79275
28 Other Manufacturing Industries	124231	10513	97260

Source : Department Of Statistics, *Industrial Survey : Construction, Manufacturing, Mining, Stone Quarrying 1987*, Kuala Lumpur

TABLE A - 4
SURVEY DATA, MANUFACTURING, 1988

	VA (Thousand M\$)	Person (Person)	Capital (Thousand M\$)
1 Food	2276131	71216	3196496
2 Beverage	321344	4873	388795
3 Tobacco	378299	3267	247390
4 Textile	588856	32422	620289
5 Wearing Apparel	470869	46218	283438
6 Leather and Leather Products	7397	675	10868
7 Footwear	9255	829	6713
8 Wood and Cork Products	999730	64154	1049092
9 Furniture and Fixtures	116662	12305	197032
10 Paper and Paper Products	250129	10141	1430810
11 Printing and Publishing	436132	19991	410548
12 Industrial Chemicals	1840053	7857	4084917
13 Other Chemical Products	468957	10034	416344
14 Petroleum Refineries	273232	1133	778315
15 Miscellaneous of Petroleum and Coal	57484	1019	48224
16 Rubber Products	1336171	46962	1344848
17 Plastic Products	340072	20325	431362
18 Pottery, China and Earthenware	68462	4703	124522
19 Glass and Glass Products	104367	2847	339538
20 Non-Metallic Mineral Products	819964	18550	3088340
21 Iron & Steel	430232	10171	1468179
22 Non-Ferrous Metal	115180	3003	251898
23 Manufacture of Fabricated Metal	507161	23958	831774
24 Machinery	461202	16148	547327
25 Electrical Machinery	2714144	131549	2663666
26 Transport Equipment	591267	14885	906757
27 Scientific & Measuring & Controlling Equipment	139691	7992	127738
28 Other Manufacturing Industries	134465	11106	96299

Source : Department Of Statistics, *Industrial Survey : Construction, Manufacturing, Mining and Stone Quarrying 1988*, Kuala Lumpur