Alternative Industrial Strategies and Effects of Fiscal Incentives and Trade Policy in Achieving Employment Objectives in Malaysian Industrialisation.

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Abstract

This study is concerned with alternative industrial strategies for employment creation. The two strategies are export-oriented and import substitution industrialisation.

Malaysia tried the import substitution strategy and achieved some degree of success in the period 1957 to 1970. But with high unemployment and the limitation of the domestic market, another strategy then had to be pursued. So in the early 1970s, (emulating the newly industrialised countries) Malaysia embarked on an export-oriented industrialisation strategy.

Two instruments are used by the Malaysian government to promote those strategies; fiscal incentives and trade policy. The study finds that fiscal incentives have promoted export-oriented industrialisation. Trade policy initially helped import substitution but in later years the policy was liberialised to approach a free trade regime. The effects of these two instruments are examined through their influence on the cost of capital to manufacturers. The study finds that fiscal incentives have reduced capital cost much more than trade policy.

The study then examines the manufacturing sector's ability to generate employment. Two methods are used; an estimation of elasticity of substitution and a case study of the characteristics of export-oriented and domestic-oriented establishments.

The elasticity of substitution measures flexibility to absorb labour. The estimates show that export-oriented establishments have greater substitution possibilities than domestic-oriented ones.

These estimates are substantiated by qualitative information, namely establishments responses to policy changes. This information is obtained through a detailed study of establishments characteristics. Two industries - textiles and

electrical/electronics - were chosen as case studies. The characteristics show that in general export-oriented establishments can absorb more labour through high growth rates and employment size.

Thus, export-oriented industrialisation can generate more employment than import substitution because its elasticity of substitution is larger and there is higher absorption of labour by export-oriented establishments.

The thesis suggests two ways to increase employment: first, to promote EOI because its employment potential is greater than ISI, and second, to increase the proportion of labour used through changes in relative factor price because capital-labour substitution exists. The labour coefficient can be increased by 8 — 25 per cent if factor market distortions are eliminated. This increase represents 120,000 to 360,000 new jobs in the Malaysian manufacturing sector.

Two policy thrusts are suggested for the promotion of EOI:

(1) Liberalisation of trade policy, namely the reduction not only of average tariff but also its dispersion. The present low and stable exchange rate regime should be maintained, because it encourages exports.

(2) Reform of the fiscal incentive system. More direct and indirect exporting industries should be added to the list of promoted industries/activities. In addition, new export incentives should be introduced such as providing utilities for exporters at levels equal to other competing countries and benefits of existing ones increased.

Relative factor prices can be changed through trade policy and fiscal incentives. The import duty (tariff) on machinery and equipment should be reduced and exemption of import duty withdrawn, so that capital prices move closer to world levels. One of the fiscal incentives, the Investment Tax Allowance, should stop because its benefits directly favour capital users. On the other hand, benefits to labour users should be introduced, for example the government should offer an abatement of income for labour incentive to support labour use.

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GENERAL INTRODUCTION

A question that often comes to the mind of government planners is; which direction should industrialisation follow?

Malaysia tried the import substitution strategy and achieved some degree of success in the period 1957 to 1970. But with high unemployment and the limitation of the domestic market, another strategy then had to be pursued. So in the early 1970s, (emulating the newly industrialised countries) Malaysia embarked on an export-oriented industrialisation strategy. However, import substitution industrialisation is still practised, particularly in certain industries like motor vehicles.

This study will examine which industralisation strategy to follow in respect of employment creation possibilities. In other words, we will seek a policy that has the larger employment potential.

Following the Hecksher-Ohlin-Samuelson Model, Malaysian export-oriented industries should be labour-intensive, thus fully taking advantage of Malaysia's labour which is cheaper than developed countries. Export-oriented industries, of high growth potential, should use labour-intensive production methods so as to attain one of the main objectives of industrialisation, namely employment creation. We will investigate this line of reasoning.

Before going further into the discussion of the objectives and organisation of the study, it may be helpful to summarise the import substitution and export-oriented industrialisation strategies. Therefore, the discussion below covers only issues relating to industrial strategy, not broader issues on the inward-and outward-looking strategies.[1]

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1 Inward-and outward-looking strategies include a wider spectrum of the economy such as agricultural sector, export of primary commodities and implicit gains of education and training.

Import Substitution vs. Export-oriented Strategy

Import substitution (ISI) promotes domestic production of previously imported manufactured goods and simultaneously protects the domestic markets for those goods. The goal is to create opportunities for growth and increase the welfare of the nation.[2] ISI is a reaction when one group of countries is economically better off, and have greater wealth and capital than another group of countries.

The ISI strategy used direct instruments such as tariff, quotas and other import restrictions on imports and a multiple tier exchange rate system. These make imports expensive and domestic production of these goods becomes very profitable. Beside direct instruments, there are also indirect ones such as government purchasing policy.

The early use of ISI (1914-45), particularly in Latin American countries however was not due to the policies adopted but rather induced by the external situation.[3] The external factors were two world wars and deep depression, which together halted exports of primary commodities from LDCs and caused shortages of imports of manufactured goods from developed countries. After the 1950s however, ISI was adopted as a means of reducing imports. In other cases ISI is merely a way out of balance of payments difficulties.

ISI often follows two stages; viz:

i) Mainly the production of consumer goods. The process involves the adoption of existing production techniques. This is also known as the easy stage. Many countries apply this type of ISI because they can protect domestic markets quite easily by the imposition of tariffs and the foreign exchange earned can be used to finance import of intermediate goods.

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2 Bruton, H., 1989 "Import Substitution" in Chenery, H. and Srinivasan, T., N., (eds), Handbook of Development Economics, Vol. II, Elsevier Science Publishers, B.V, page 1602.

3 Schmidt, H., 1984. "Industrialisation Strategies in Less Developed Countries: Some Lessons of Historical Experience" in Kaplinsky, R., (ed)," Third World Industrialisation in the 1980s: Open Economies in a Closing World," Journal of Development Studies, Vol 21, No. 1, October.

ii) Production of capital and intermediate goods. Although this is a more difficult stage, if it is successful the rewards will perhaps be greater; indigenous technical skill and know-how could be developed.

ISI is adopted in many countries, for example Brazil, Argentina, Mexico, India, the Philippines and Nigeria. Success is more evident in countries that adopted the first-stage ISI (for example Brazil). Those that concentrate on the second-stage (like India) have grown more slowly but have succeded in developing indigenous technology. The success of ISI can be measured by Gross Domestic Product (GDP) increases and the growth of the manufacturing share in GDP. After the easy stage has been in place for some years, it is found that ISI cannot sustain a reasonable economic growth. Many ISI countries experience a slowing output and productivity growth as time goes on. Furthermore, industrial efficiency may be low and be reflected in the high output costs compared with imported prices.

The dismal performance[4] of ISI leads to discussion about the strategy's weakness. Among them;

a) The excessive protection measures distort factor and product markets and cause inefficient resource allocation from other sectors to ISI sectors.
b) Although imports of consumer goods are reduced, those of intermediate goods, which are needed for ISI production, will have to increase and this may cause balance of payments difficulties.
c) Measures to promote ISI discourage exports. By definition, these measures are contrary to the requirements of free trade; high tariff, quotas and restrictions prevent the flow of trade. In some cases the gains from ISI sectors and measures like export tax have moved investment away from export to ISI sectors.
d) The ISI regimes need strong government participation. ISI usually

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[4] For example, ISI countries like Brazil, Egypt, India and Chile only managed annual growth rates between 2 to 4 per cent during 1960–1970. See Krueger, A. O., 1978. Liberalization Attempts and Consequences. New York, Ballinger Publishing Company for National Bureu of Economic Research.

means control and licensing; these are administratively complex and often inconsistencies creep into the system. Such situations easily breed corruption and discourage private initiative.

These and other similar problems faced by ISI countries meant that other strategies were tried. Export-oriented industrialisation (EOI) was seen as the new policy. It advocates that industrialisation should be spearheaded by exports. Countries that adopted EOI (most notable ones being Newly Industrialised Countries such as South Korea, Taiwan, Hong Kong, and Singapore) have shown tremendous economic growth. For example, the South Korean per capita Gross National Product grew by 8 per cent annually for the period 1962-1977.[5] Empirical support for the success of EOI comes from the significant correlation found between export expansion and output growth. The five countries mentioned achieved 8 to 11 per cent annual growth of GDP over the period 1965-78 and annual manufactured export growth rates of 20 to 40 per cent over the same period.[6]

The main instruments associated with EOI minimise price distortions; they allow market forces to allocate resources, so that the economy expands in line with its comparative advantage. They include liberalisation of imports, adoption of 'realistic' exchange rates and incentives for exports. Another part of EOI is that even though it advocates exports, ISI activities are not penalised. EOI also encourages the integration of the domestic economy into the world economy through competition (efficient use of resources), and externalities (economies of scale). For countries with balance of payments deficits, EOI also helps growth; export proceeds relieving import shortages.

Although EOI has proved to be a successful strategy, there are a number of important qualifications to consider:

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5 Hong, W., 1981, "Export Promotion and Employment Growth in South Korea" in Krueger, A., Lary, H.B., Mason, T. and Akrasanee, N., (eds), Trade and Employment in Developing Countries: Individual Studies, Vol 1, Chicago, University of Chicago Press for the National Bureau of Economic Research.

6 See Schmidt (1984), op. cit.

(a) Some consider the high GDP growth of the NICs is a result of favourable international conditions and not due to deliberate economic policy. After the Second World War, the developed countries opened their markets to developing countries. International financing such as massive economic aid programmes was set up. Multinational companies relocated from developed countries to LDCs to take advantage of the low labour costs. Those LDCs with strong government, good infrastructure, and an important geo-political location took advantage of these opportunities and prospered.

(b) EOI has produced too many 'footloose' industries, with minimal linkages to the rest of the host country, which have low value added and providing little transfer of technology. It is easy for these industries to relocate, if conditions in the host country change for the worse. This criticism is mainly directed at multinationals. However, these industries do contribute significantly to the host country in terms of employment generation.

(c) Many doubt that the past success of the NICs can be repeated under conditions of a slowdown in the world economy and more protectionism in developed countries.

(d) Others disagree that economic liberalisation is a fundamental requirement for the success of EOI.[7] In South Korea the government intervenes strongly, by introducing regulations, import facilities and foreign exchange controls that make investment in the export sectors very attractive; this is the opposite of a liberal approach.

So far, this discussion has looked at EOI and ISI as alternatives. However, many see them as strategies that should be implemented together. EOI cannot succeed unless preceded by ISI which will provide the industrial structure, skill and technology needed to export successfully. This theory however does not have much empirical support - the aggressive exporting countries like Hongkong and

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[7] For example see, Amsden, A., 1989. Asia's Next Giant: South Korea and State Industrialisation, New York, Oxford University Press.

Singapore did not use ISI much and those that are very committed to ISI (like India) find it difficult to switch to export production. The ISI experience is not necessary especially in the case of transfer of production by the multinationals. However, recent studies show that some countries (for example Brazil and Korea) regard these two strategies as complementary. According to Kirkpatrick, Lee and Nixson, "Korea practises combined policies of selective ISI and EOI, with ISI being used to develop local manufacturing capacity which provides the basis for subsequent exporting activities."[8]

Other countries adopt both strategies together but often with ISI industries separate from EOI and with different measures applied to each of them. One example is Malaysia, where EOI industries are mainly electronic assembly factories located in special industrial areas, isolated from other domestic industries. On the other hand, the ISI industries are mainly those producing consumer goods, such as food and plastic products.

ISI is perceived has having an unfavourable effect on employment. High percentage rates of industrial investment and output growth are accompanied by relatively slower absorption of labour. Moreover, ISI production processes are usually capital-intensive ones imported from developed countries which do not match LDCs factor proportions.

On the other hand, EOI is supposed to encourage the development of industries according to a country's comparative advantage which means, in LDCs, industries that are labour-intensive (labour being cheaper than capital). Hence export growth (i.e. increase in output) will create more employment. The EOI employment generation capacity is only useful if there is no full employment.

The above points will be tested in this thesis.

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8 Kirkpatrick, C.H., Lee, N. and Nixson, F.I., 1984. Industrial Structure and Policy in Less Developed Countries, London, Allen & Unwin, page 199. Also, see Amsden (1989), ibid.

Objective of the Study

In many Less Developed Countries (LDCs) industrial development means the adoption of developed countries' factor proportions. This requires use of more capital than labour in production processes. But LDCs usually have abundant labour and little capital. If developed countries' factor proportions are to be adopted by LDCs, this may not use factors of production in the best way.

Furthermore, one of the economic objectives of the Malaysian government is to provide employment through industrialisation. With rising urban unemployment, the industrialisation strategy chosen must be one that can absorb abundant labour.

The future of Malaysian industrialisation depends on the flexibility of substitution between factors of production. The success of incentives or policies to encourage more use of labour is largely dependent upon this flexibility. Industrial development that uses factor proportions similar to the country's factor endowment will produce a balanced and stable development.

The objective of the study is to identify which industrial strategy - ISI or EOI - can generate more employment. The study uses two approaches: it calculates the elasticity of substitution and then conducts two case studies.

The elasticity measure quantifies the ease with which the two factors of production (capital and labour) can be substituted for each other. The values of elasticity can be useful to policy makers for monitoring and changing relative prices to ensure greater labour absorption.

However, it is only an aggregate measure. To give a more meaningful analysis, the elasticity should be supplemented by qualitative information. In this respect, case studies were made in the electrical/electronic and textile industries to find out about export-oriented establishments' (EOEs) and domestic-oriented establishments' (DOEs) characteristics. The findings from the case studies must be interpreted with care, due to the limited number of establishments (20 textiles and 14 electrical/electronics).

This study contains eight chapters. The first three chapters provide background information on Malaysian industrial development and the policies used to promote EOI and ISI, namely trade policy and fiscal incentives.

Chapter 1 summarizes the manufacturing sector growth since independence (1957) to the present. It touches on structural change, growth and capital intensity. This chapter also divides the industries into exports, import-competing and non-import-competing in order to analyse their performance in absorbing labour. Export industries are found to employ more workers than import-competing ones.

Chapter 2, on trade policy, starts by discussing the instruments used. They include tariff, exemption from duty, qualitative restriction and exchange rates. The trade policy was initially used to promote ISI but was later liberalised in order to help EOI. However, the degree of ISI was not excessive, as reflected by the effective protection rate, so that the change to EOI was not too difficult. The effect of trade policy on the users' cost of capital is also estimated.

To complete the background information on factor market distortion, chapter 2 also includes a discussion on the Malaysian labour market. Real wages have increased and the labour market is found to be segmented and not very responsive to market forces.

Chapter 3 covers fiscal incentives as set out in the three main Acts - Pioneer Incentives Act (1965), Investment Incentives Act (1968) and Promotion of Investment Act (1986). The three Acts are compared in terms of the amount of benefits and the basis on which they are given. Fiscal incentives reduce the users' cost of capital significantly (by much more than trade policy does). It was also shown that incentives are used to promote EOI.

Chapter 4 sets the scene for the estimation and comparison of the elasticity of substitution. Two models are selected for estimation purposes - the

Constant Elasticity of Substitution (CES) and the Translog Function (Translog). This chapter then compares the elasticity of developed countries, LDCs and Malaysia. Developed countries estimates are higher than LDCs, while Malaysia's conform with those of LDCs.

Chapter 5 calculates the elasticity of substitution of Malaysian electrical/ electronic and textile industries. The two factor estimates (CES) are calculated at the industry, EOEs, DOEs and product levels (5 digits). The three factor substitution (Translog) is only done for EOEs and DOEs. These estimates conclude that:

- The EOEs substitution is greater than DOEs.
- There are only slight changes in the elasticity values from 1979 to 1985. They are mainly around 1.0.
- The industry estimates are not representative of the product level.
- The three factor substitution can be collapsed into two which means that skill is not a separate factor of production.

Chapters 6 and 7 deal with the case studies of electrical/electronic and textile industries respectively. The electrical/electronic industry is found to be dualistic: the EOEs are easily identified from DOEs in terms of ownership, product and location. The textile industry is the opposite - it is not possible to differentiate between the two types of establishments just by looking at the above criteria.

However, the EOEs and DOEs characteristics can be summarised as follows:

(i) The **different** characteristics are:

- EOEs capital size is larger than DOEs.
- EOEs level of technology is more advanced.
- DOEs capital productivity is higher.

(ii) The **similar** characteristics are:

- There is some backward linkage but none in the forward direction.
- The largest wage increase is among production workers.
- Pioneer status is the most popular incentive.
- Both use the cheapest production methods.

(iii) **Differences between industries** are:

Electrical/electronics	Textiles
• EOEs products are different from DOEs.	Overlapping products.
• EOEs are located differently from DOEs	EOEs and DOEs are in similar location.
• EOEs are foreign owned while DOEs are local owned	No distinct pattern of ownership.
• EOEs employment size is larger.	DOEs are larger.
• EOEs capacity utilisation rate is higher.	DOEs are higher.
• EOEs proportion of unskilled workers is higher.	DOEs are higher.
• It is unclear which establishment has higher capital intensity	EOEs are higher.
• DOEs have higher labour productivity.	EOEs are higher.

In terms of performance during the period 1979-85 , EOEs showed better results than DOEs. Their output is higher, rate of employment reduction is smaller and capital growth is slower.

Chapter 8 summarises the findings of the previous ones and suggests policies for employment creation. It is shown that EOI can generate more employment than ISI because its elasticity of substitution is larger and EOEs can absorb more labour through high growth rates and large employment size.

The thesis suggests two ways to increase employment: first, to promote EOI because its employment potential is greater than ISI, and second, to increase the proportion of labour used through changes in relative factor price because capital-labour substitution exists. The labour coefficient can be increased by 8 — 25 per cent if factor market distortions are eliminated. This increase represents 120,000 to 360,000 new jobs in the Malaysian manufacturing sector.

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All monetary values in this study are Malaysian Ringgit.

CHAPTER 1

MANUFACTURING SECTOR GROWTH AND STRUCTURAL CHANGE

1.1 Review of Studies

1.1.1 Review of Studies on Industrialisation in Malaysia

The study of the Malaysian manufacturing sector started with Wheelwright (1963)[1], followed by Lo (1972)[2], Ridzuan (1972)[3], Lim (1973)[4] and Hoffmann and Tan (1980)[5]. These studies, generally, discussed the growth performance and structure of the manufacturing sector.

Study of Growth

Wheelwright looked at the contribution of manufacturing to employment and output and also at the possibility of using tariffs to help develop the manufacturing sector.

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1 Wheelwright, E.L., 1963. "Industrialisation in Malaya", in Silcock, T.H. and Fisk, E.K., The Political Economy of Independent Malaya: A Case Study in Development, University of California Press.

2 Lo, S.Y., 1972. The Development Performance of West Malaysia 1955-1967, Singapore, Heinemann Educational Books (Asia), Ltd.

3 Ridzuan, A., 1972. Growth, Structural Change and Employment Creation in the Malayan Manufacturing Industries since Independence , Ph.D. dissertation, The University of Hull, unpublished.

4 Lim, D., 1973. Economic Growth and Development in West Malaysia 1947-1970, Kuala Lumpur, Oxford University Press.

5 Hoffman, L. and Tan, S. E., 1980. Industrial Growth, Employment and Foreign Investment in Peninsular Malaysia, Kuala Lumpur, Oxford University Press.

Even though Lo studied the development performance of the industrial sector, he also analysed income and expenditure, saving and investment, and money and prices. His analysis of labour and structure of production was more detailed than Wheelwright.

As part of his analysis of economic growth and development, Lim chose to examine the rate of the industrial sector growth in the economic diversification programme. One of the main issues was the ability of the manufacturing sector to absorb labour and he showed this to be quite high. Lim also suggested export–oriented industrialisation which concentrated on labour–intensive products as one of the ways to develop the manufacturing sector.

The most detailed study of manufacturing sector structure and growth was carried out by Ridzuan. He ranked industries by their value added and net import ratios and then studied the factors that contributed to the growth experienced by the various industries.

From there, Ridzuan moved to the sources of growth, and especially the deviation from the proportional growth path. He also linked the forward and backward linkages to industrial growth in order to determine which industries should be developed, based on their linkage effect.

The latest study on manufacturing structure and growth was by Hoffman and Tan. The difference of this study when compared with earlier ones is the inclusion of more measurements and additional concepts. It introduced the analysis of scale economies; linkages between factor substitution and scale; between factor substitution and capital intensity; and the impact of foreign direct investment. Sources of growth, namely export, import–substitution and domestic expansion, were examined for their capacity to absorb labour and capital.

Study of Employment

The study of employment creation in the manufacturing sector was pioneered by Ridzuan, and Osman–Rani[6] and Anwar[7] picked this subject as the main theme of their work. Ridzuan started his analysis by looking at the factors that determined changes in manufacturing employment. These factors are: change in total output; change in product mix and productivity. Change in product mix (i.e. mixture between consumer, intermediate and investment goods) is the factor that most affected employment.

Anwar did a wider study on industrialisation and employment creation, and linked employment creation with several factors that influence it. These factors are: fiscal incentives; tariff policy; size of manufacturing establishment; manufacturing exports and regional concentration. Employment absorption was found to be highest through import substitution and domestic demand expansion. Small and medium scale establishments were shown to have high employment creation capability compared with the larger ones. Thus, small and medium scale establishments should be encouraged through import substitution and domestic expansion policies in order to create employment.

Osman–Rani covered a similar topic to Anwar but differed in emphasis. Osman–Rani looked at regional industrial balance and labour employment through technology and size of manufacturing (using different size criteria from Anwar). He concluded that small and medium size establishments can have the short–run function of creating employment, as well as ensuring regional balance, because these establishments have localized sub–markets, depend on agglomeration economies and linkages and absorb part–time and home workers.

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6 Osman-Rani, H., 1978. "Employment Aspects of Industrialisation: Malaysia's Experience", Occasional Paper, No. 9, Faculty of Economics, National University of Malaysia.

7 Anwar, A., 1982. Industrialisation and Employment Creation in a Developing Economy: An Analysis on Malaysia , Ph.D. dissertation, University of Kent, Canterbury, unpublished.

Other Studies

Most of the other studies on industrialisation have looked at the effect of fiscal incentives and tariffs. The question of protection is important for pioneer or infant industries but can also lead to the inefficient use of factors of production. Examples of these studies are Power (1971)[8], Edwards (1975)[9], Von Rabenau (1976)[10], Ariff (1975)[11], Hooi (1983)[12] and Teh (1975)[13].

Ariff extends his work to include the effect of protection and incentives on manufactured exports growth. Manufactured exports growth is important because of its strong relationship to gross national product and employment. Ariff found that incentive systems produced a favourable bias towards capital–intensive and large–size establishments.

Other areas of interest in the manufacturing sector were small–scale industry (Chee; O'Mara)[14], import substitution industries (Tan; Ariff)[15] and

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[8] Power, J.H., 1971."The Structure of Protection in West Malaysia" in Balassa, B. and Associates, The Structure of Protection in Developing Countries, Baltimore, Johns Hopkins University Press for the World Bank.

[9] Edwards, C.B., 1975. Protection, Profits and Policy: An Analysis of Industrialisation in Malaysia, 2 Vols. Ph.D. dissertation, University of East Anglia, Norwich, unpublished.

[10] Von Rabenau, K., 1976."Trade Policies and Industrialisation in a Developing Country: The Case of West Malaysia", Malayan Economic Review, Vol. XXI, No.1, April.

[11] Ariff, K.A.M., 1975. "Protection for Manufactures in Peninsular Malaysia", Hitotsubashi Journal of Economics, Vol. 15 No 2, February.

[12] Hooi, E.L., 1983. Trade Policies and Their Effects on The Growth and Structure of Manufacturing Industries in Peninsular Malaysia: 1960-1980 , Ph.D. dissertation, School of Economics, University of the Philippines, unpublished.

[13] Teh, K.P., 1975. Protection, Fiscal Incentives and Industrialisation in West Malaysia since 1957 , Ph.D. dissertation, Oxford University, unpublished.

[14] Chee, P.L., 1975. The Role of Small Industry in Malaysian Economy , Ph.D. dissertation, Faculty of Economics and Administration, University of Malaya, unpublished.

O'Mara, G.T., 1975. "An Econometric Analysis of Small Scale Industry in Malaysia", Northwestern University, IBRD.

[15] Tan, T.N., 1973. "Import-Substitution and Structural Change in the West Malaysian Manufacturing Sector 1959-1970", University of Malaya, Kuala Lumpur, mimeo.

Mohamed Ariff, K.A., 1974. "Industrialisation in Peninsular Malaysia: An empirical Analysis of Import Substitution and Market Expansion", in Suzuki, N. (ed), Asian Industrial Development, Proceedings of the Symposium in Appraisal of Import Substitution and Prospects of Export-oriented Industrialisation with Special Reference to Southeast Asia.

capital utilisation capacity (Gan[16]; Hoffmann and Tan[17]; Lim[18]; Cheong[19]).

1.1.2 Review of Studies on Capital Intensity

Discussions on the structure and characteristics of the manufacturing sector will, inevitably, touch on capital intensity. The desire to use optimally a country's factor endowments (namely labour and capital) prompts intense discussion on whether that country should pursue labour–intensive or capital–intensive production processes. Based on the well–known Heckscher–Ohlin–Samuelson model, a country with an abundant labour force (usually a developing country) should concentrate on labour–intensive industries, while a country with more capital (usually a developed country) should focus on capital–intensive industries. But this theory is contradicted by the "Leontief Paradox" (1954)[20]. He showed that the United States, which is a capital–surplus country, exports labour–intensive products.

Exports of developing countries need not always be labour–intensive because their production processes, more often than not, are constrained by imported technology which is usually capital–intensive. Usually this type of production technique is transferred from developed countries in order to utilise the relatively low labour cost, but labour–intensive techniques are only used in certain stages of the production process.

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16 Gan, W.B., 1974. Capital Utilisation in West Malaysian Manufacturing Sector: A Case Study on Eleven Manufacturing Industries, M.Ec thesis submitted to the Faculty of Economics and Administration, University of Malaya, unpublished.

17 Hoffman and Tan (1980), op. cit.

18 Lim, D., 1976. "Capital Utilisation of Local and Foreign Establishments in Malaysian Manufacturing", The Review of Economics and Statistics, Vol. LVIII.

19 Cheong, K.C., 1973. "Production Functions, Capacity Utilisation and Technological Progress in Developing Countries: An Analysis Using West Malaysian Data", Kajian Ekonomi Malaysia, Vol. X, No. 2, December.

20 Leontief showed that for the United States, which is a capital abundant country, exports are less capital intensive than her competing imports. The controversy continues with works supporting and rebutting Leontief's Paradox. One of the later works is by Leamer, E.E., 1980. "The Leontief Paradox, Reconsidered", Journal of Political Economy, Vol.88 No. 3, June.

Hence, the topic of capital intensity generates a lot of interest; and in a developing country concentration on labour–intensive production processes cannot be taken for granted as the best course of action. What follows is a review of selected studies on capital intensity, in particular looking for the reasons why industries become more capital–intensive and the effect of incentives on capital and labour use.

Lim[21] used Lary's index[22] to calculate Malaysian manufacturing industries' capital intensity (for 1968 census data). For that period the capital–intensive industries were petroleum and coal products, beverages, tobacco, chemicals and chemical products, non–metallic mineral products, food manufacturing and processing of estate–type agricultural products. The labour–intensive industries were footwear and wearing apparel, leather and leather products, furniture and fixtures, other machinery and paper products.

Teh[23] extended the coverage period to 1963, 1968 and 1971. The industries that Teh identified as capital–intensive and labour–intensive were the same as those noted by Lim. The rankings of the Lary's index for the three years were found to be quite similar. This meant, that, although there were minor changes in industries' ranking, the industries that were identified as capital–intensive or labour–intensive were basically unchanged throughout the period 1963 to 1971.

Osman–Rani[24] looked at the relationship of capital intensity and size of establishment. Establishments were categorized according to the quantum of their gross sales. The categorisation is broad, being only three categories; small,

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21 Lim (1973), op. cit.

22 Lary's index is the value added per worker. For further explanation see Lary, H.B., 1968. Imports of Manufactures from Less Developed Countries, New York, National Bureau of Economic Research.

23 Teh (1975), op. cit.

24 Osman-Rani (1978), op. cit.

medium and large. Large establishments were found to be twice as capital–intensive as small or medium ones.

After using the Lary's index for the above calculation, Osman–Rani tried another measurement which used the capital utilisation approach. Basically the measurement is a capital–labour ratio where capital is measured by fixed assets. This is a stock–flow concept and can be affected by the degree of capital utilisation, factor prices and technological changes. The ratios also do not take into account the efficiency aspect, unlike Lary's index. This measurement , with its differences, produced the same result as the Lary's index. Both calculations used the 1968 census data.

The relationship between capital intensity and establishment size according to the number of workers employed was studied by Anwar[25]. The industries were classified into small (less than fifty employees), medium (fifty to two hundred employees) and large establishments (more than two hundred employees). The data used was 1963, 1968 and 1973 census data.

The results obtained by Anwar were comparable to those of Osman–Rani. The magnitude of the measurement (Lary's) was similar. Hence the conclusion was that establishments with a large number of employees were capital–intensive. The smaller establishments were mostly labour–intensive. It would be interesting to see if this conclusion still holds for electronic components establishments which employ large numbers of employees and are considered to be labour–intensive.

A more detailed study of capital intensity was carried out by Hoffman and Tan[26]. They used three measurements, namely, the capital–labour ratio, the value added per worker and Morawetz's index. Morawetz's index is the ratio

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[25] Anwar (1982), op. cit.

[26] Hoffman and Tan (1980), op. cit.

of the output elasticities of capital and labour. The rankings of the three measurements were very weakly correlated. After weighing the merits and implications of the three measurements, Hoffman and Tan came to the conclusion that there were more capital–intensive industries than labour–intensive ones.

The 1970 data was used at a more disaggregated level (four digit MIC code). Hence, this study could be linked with others (namely Lim and Teh) if one is interested in the trend of which industries were capital–intensive and which were labour–intensive. This study is also different from the others in that it covered the relationship between scale economies and capital intensity and showed that industries with increasing returns to scale are usually capital–intensive.

These studies indicated that industrial growth might not necessarily bring the biggest employment opportunities if it is based on increasing returns to scale and large size firms. This conclusion is derived from linking different aspects of production characteristics to capital intensity:

- Osman–Rani found that it is pointless to encourage an upward trend of the average firm size because this will only encourage more use of capital.

- If the Malaysian manufacturing sector is to develop, industries with increasing returns to scale should be promoted. But, as Hoffman and Tan concluded, establishments with returns to scale are capital–intensive ones.

- Anwar showed that the bigger the number of workers an establishment employed, the more capital–intensive it became.

- Lim advocated that labour–intensive industries should be the base of industrial development strategy but showed that there was no relationship between industrial growth and capital intensity (or lack of capital intensity). Therefore, labour–intensive industries should be encouraged because of their employment generating capacity.

Thus, it seems difficult to increase employment opportunities through the manufacturing sector. To encourage large establishments (large in terms of sales, or with increasing returns to scale, or which employ many workers) will only increase the capital intensity. Thus, employment creation, which is one of the main objectives of industrialisation, will not be easily achieved.

To make matters worse, government incentives have made capital cheaper relative to labour. There are more capital incentives than labour ones. Several studies such as Teh (1975)[27], Young (1980)[28], Anwar (1982)[29], World Bank (1981)[30], Edwards (1975)[31], Hoffmann and Tan (1980)[32] and Hooi (1983)[33] showed the effect of these incentives on the cost of capital.

1.2 Malaysian Manufacturing Sector Growth

1.2.1 The Period Before Independence.

During this period the Malayan economy was already oriented towards exports and imports. This open–ness was reflected in the rate of gross export

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27 Teh (1975), op. cit.

28 Young, K., Bussink, W.C.F. and Hassan, P., 1980. Malaysia: Growth and Equity in a Multiracial Society, Baltimore, The Johns Hopkins University Press.

29 Anwar (1982), op. cit.

30 World Bank, 1981. "Malaysia's Manufacturing Sector: Development Issues and Policy Options", Report No. 3187-MA, 3 Vols., Washington.

31 Edwards (1975), op. cit.

32 Hoffman and Tan (1980), op. cit.

33 Hooi (1983), op.cit.

proceeds/GDP which was, on average, 47.7 per cent for 1947–1960. The economy benefited from its dependence on exports; the GDP increased by 60 per cent from $ 2,982 million (1947) to $ 4,852 million (1957). The first growth push was in 1950–1951 when the hostilities in Korea increased the demand for raw materials such as rubber and tin. The second push was in 1955–56 due to the economic prosperity experienced by U.S.A and Europe.

The manufacturing sector in Malaya[34] constituted only 14.8 per cent of the GNP (1952)[35] and provided 7.5 per cent of the employment opportunities (1947)[36]. Economic activities were mostly agriculture (especially rubber) and tin mining. These two sectors together contributed about 72 per cent of the GNP (1952) and 69 per cent of employment (1947).

Malaya's industrial activities were also closely associated with rubber and tin, and were mainly primary commodity processing such as rubber milling and packing, saw milling and tin smelting. Other industries were:

Handicrafts; which includes activities like attap making and rattan ware, tailoring and dressmaking.

Food, drink and tobacco.

Engineering; which includes railway workshops, dockyards, installation and repair work, foundries and forges.

Other manufacturing; which includes bricks, tiles, rubber goods, furniture, newspaper, printing and photography.

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[34] After 1963 Malaya became Malaysia and comprises Malaya (now called Peninsular Malaysia), Sabah and Sarawak.

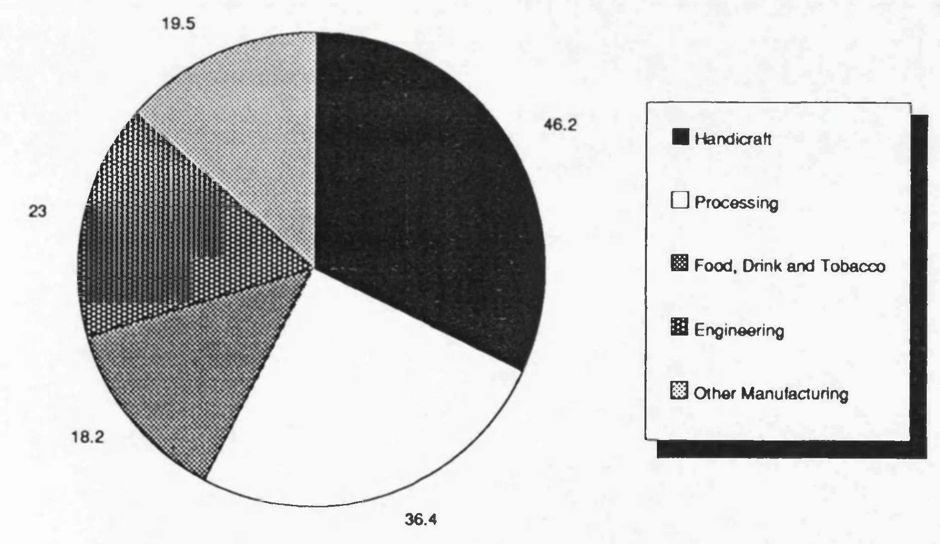
[35] Federation of Malaya, Industrial Development Working Party Report, 1957, Appendix I, Table F, page 52.

[36] Lim, Chong-Yah, 1967. Economic Development of Modern Malaya, Kuala Lumpur, Oxford University Press, Table 7.9, page 52.

The growth of certain industries was the result of overseas demand; for example concentrated latex, tin and pineapples. Other industries owed their growth mainly to the expanding domestic market.

Figure 1.1 shows that in 1947 the handicrafts industry has the largest number of employees. This is to be expected as this industry requires mostly labour and little capital. On the other hand engineering and other manufacturing industries together employ about the same number of workers as the handicraft industry while presumably using more capital because of the nature of their activities.

Figure 1.1
Federation of Malaya; Workers Engaged in Secondary Industries 1947 (Thousand)



Source: Federation of Malaya, 1957. Report of the Industrial Development Working Party, Kuala Lumpur, Government Printers, Appendix IV, page 59.

One interesting feature of industrialisation of that time was that many new ventures were started for products which were relatively labour–intensive and required little capital. However, failures among these new ventures were common.; often the local products were unable to match the superior quality of imported goods. These new ventures were supposed to be the foundation of Malaya's industrial development. Noting these failures, the Industrial Development Working Party recommended that a large amount of capital was needed to develop the industrial sector, irrespective of the capital–labour ratio used[37]. The report also warned that the introduction of capital would restrict the scope for employment of unskilled labour[38].

There is no published data on capital usage in the manufacturing industries during this period. The Industrial Development Working Party estimated that even though there were considerable reserves of capital in the country, only a small proportion was used for industrial investment[39]. This lack of domestic capital investment was compensated by foreign capital investment. The World Bank Mission[40] provided data on gross private capital formation. This is shown in table 1.1. Since there is no breakdown of capital formation data according to sector, the only conclusion that can be drawn is that the biggest part of the capital increase was in the form of machinery and equipment.

During the pre–independence period, most establishments in the Malayan manufacturing sector were small–scale family enterprises. The number of workers employed in these enterprises was usually less than 20. Few of the establishments had large–scale and highly capitalised production processes or were funded by large amounts of capital.

Nearly 40 per cent of the workers in the manufacturing sector were owners of the establishments or unpaid family members. This was especially so in establishments with less than 10 workers. Hence, establishments of these size used very little capital because the labour was cheap.

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37 Federation of Malaya (1957), op. cit, page 6.

38 Ibid, page 18.

39 Ibid, page 20.

40 International Bank for Reconstruction and Development (IBRD), 1955. Report on The Economic Development of Malaya, Baltimore, Johns Hopkins Press.

Table 1.1
Gross Private Capital Formation, Malaya

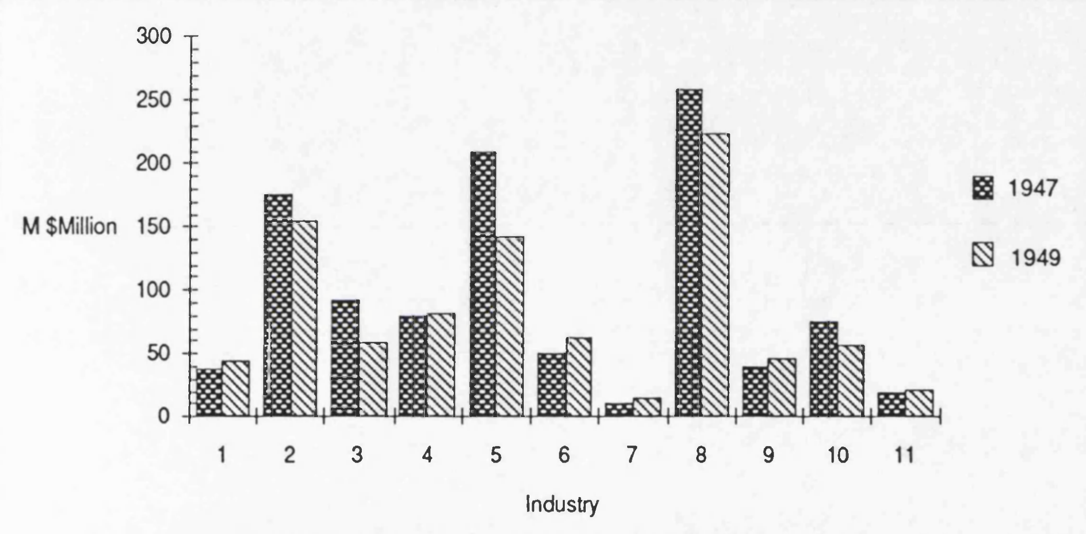
	($ Million)				
	1949	1950	1951	1952	1953
Fixed Capital Formation					
Machinery, equipment, etc.	70	95	115	150	115
Commercial vehicles and vessels	15	20	50	65	50
New buildings	50	60	80	110	100
Agricultural and mining rehabilitation and development (n.e.s.)	60	40	40	35	35
Rubber replanting	20	25	40	45	40
Total	215	240	325	405	340
Value of Physical Increase in Stocks					
Rubber	–15	+30	–60	+ 5	–10
Tin	+40	–85	+ 5	– 5	+ 5
Other	+45	–35	+20	+100	+30
Total	+70	–90	–35	+100	+25
Total: Gross Private Capital Formation	285	150	290	505	365

Source: International Bank for Reconstruction and Development, 1955. Report on the Economic Development of Malaya, Baltimore, Johns Hopkins Press.

The Industrial Development Working Party recommended that the development of the Malayan industrial sector should be based on an import substitution strategy, and thus be centered on the production of consumer goods. The industries to be promoted were food processing, beverages, building materials, textiles and pottery. These were recommended on the grounds that the forecast population growth would provide the market for these products.

Benham calculated the output for the Malayan manufacturing industries[41]. These figures included Singapore which was at that time part of Malaya. It can be seen that in 1947 wood products industries were the most important in terms of output. Next in terms of output importance was the beverage industry. In 1949, beverage became the leading industry. Output data for 1947 and 1949 are shown in figure 1.2.

Figure 1.2
Malayan Manufacturing Output 1947 and 1949



Key:

1. Pottery, glass and chemical products.
2. Foundries and metal industries.
3. Transport equipment and repair.
4. Weaving and dressmaking.
5. Food manufacturing.
6. Beverages.
7. Tobacco.
8. Wood products.
9. Printing and publishing.
10. Rubber products.
11. Others.

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[41] Benham, F., 1951. The National Income of Malaya 1947-49, Singapore, Government Printing Office.

It is difficult to see whether the industry with the largest output employed the biggest number of employees. One would have thought that the wood products industry, which has the biggest output, employs the largest number of workers. However, it is difficult to relate industry output to number of employees as this cannot be confirmed or otherwise by reference to the published statistics.

1.2.2 The Period between 1957 and 1968

In the twelve year period, Malaysian economic growth was one of the highest among non–Communist countries. In Asia, only Japan and Taiwan had higher rates. Malaysian GDP grew at 6.4 per cent per annum during the 1960–1965 period. Rapid growth occured in spite of stagnating export earnings and a sluggish rate of expansion in export volumes. The stagnation is due to the fall in rubber prices and the failure of iron ore to increase its export volume.

The domestic demand provided the impetus for output growth. Domestic output grew at 9.2 per cent while exports grew at 2.8 per cent (for 1960–1965). Public investment, in the form of development expenditure, played a bigger role than private investment in generating growth. The public investment grew at 28 per cent per annum while the private ones (mainly in planting of perennial crops and import substitution manufacturing) at 5 per cent.

The government also encouraged structural economic changes but diversification efforts had not yet substantially reduced the heavy dependence on agriculture.

After independence, the government adopted a strong industrialisation policy in response to the rapid population growth and the heavy dependence of the economy on a few primary commodities. The agriculture sector was not able to provide enough employment for a population which was growing at about

2.5 per cent per annum[42]. Fluctuation in prices of rubber and tin, the two mainstays of the Malaysian economy, meant that diversification was needed to stabilise revenue.

The first two economic evaluation reports of the Malayan economy were done by the World Bank. The preliminary report called the "Report on the Economic Development of Malaya", was made in 1955 and has been discussed earlier. The second report, called the "Report of the Industrial Development Working Party 1957", advocated the use of tax incentives to promote industrialisation. The Working Party's recommendations led to the 1958 Pioneer Industries Ordinance. This ordinance also includes tariff protection and other quantitative restrictions for imports.

During the period 1957 to 1965 the manufacturing share of GDP grew by 4.1 per cent per annum and at 12.3 per cent per annum from 1965 to 1968. In the same period, manufacturing employment grew at annual rates of 3.4 and 2.7 per cent respectively. This showed that manufacturing output or GDP grew much faster than its ability to create employment.

Table 1.2 shows that from 1965 to 1968, the manufacturing sector's share of GDP grew at 6.2 per cent per annum (from 11.0 per cent to 13.2 per cent). During the same period, the manufacturing employment share only grew at 2 per cent per annum (from 8.4 per cent to 9.1 per cent). The primary and tertiary sectors performed much worse than manufacturing.

The primary sector only grew at 0.25 per annum while the tertiary sector experienced a negative growth rate. During this period, both sectors (primary and tertiary) reduced their employment share.

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[42] See Sidhu, M.S and Jones, G.W., 1981. Population Dynamics in a Plural Society: Peninsular Malaysia, Kuala Lumpur, UMCB, page 35.

Table 1.2
Peninsular Malaysia:The Composition of Gross Domestic Product and Employment by Economic Sector, 1957-1968 (in percentages)

Sector	1957		1965		1968	
	GDP	EMP	GDP	EMP	GDP	EMP
Primary	45.7	61.3	39.6	54.9	39.9	54.6
Secondary	11.1	9.6	15.3	11.9	17.1	12.4
Manufacturing }		6.4	11.0	8.4	13.2	9.1
Building & }	11.1	3.2	4.3	3.5	3.9	3.3
construction }						
Tertiary	43.2	29.1	45.1	33.5	43.0	33.0

Note: GDP = Gross Domestic Product EMP = Employment

Sources: Department of Statistics, Monthly Statistical Bulletin, Kuala Lumpur, various issues.
Malaysia, Malaysia Plans, Kuala Lumpur, Government Printers, various issues.
Lim, D., 1973. Economic Growth and Development in West Malaysia 1947-1970, Kuala Lumpur, Oxford University Press, page112.
Wheelwright, E.L., 1965. Industrialisation in Malaysia, Melbourne University Press.

Of the four sectors (primary; manufacturing; building and construction; and tertiary) manufacturing registered the highest GDP growth rate but was second in employment growth rate.

It is clear that the manufacturing sector had a dominant role in generating economic growth, an increasing share in GDP and a high GDP growth rate. Unfortunately its impressive GDP contribution did not produce comparable growth in employment opportunities, and this was one of the main reasons for embarking on a change of the industrialisation policy.

1.2.2.1 Overview of the 1959, 1963 and 1968 Data

In 1959, the largest industry in terms of value added and employment was food production (table 1.3). This is not unexpected because immediately after independence the manufacturing base was very small and food is a basic requirement. Other leading industries were mainly resource–based, such as wood products, rubber products and tobacco. Even though food production was still the leading industry in term of value added in 1968, other industries such as chemicals and chemical products, non–metallic mineral products and printing, publishing and allied industries had also became important. These new industries can be regarded as more capital–intensive than the previous leading industries which were mainly resource–based.

This pattern is also seen in manufacturing employment. Resource–based industries and food production provided the biggest employment opportunities in 1959 and 1963. The wood products industry became the largest employer in the manufacturing sector in 1968.

When growth rates are considered, rather than absolute levels, the picture is different, with higher growth rates achieved by the "new" industries such as printing, publishing and allied industries, chemicals and chemical products, non–metallic mineral products, metal products and machinery.

1.2.2.2 Capital Intensity

Many measurements may be used as indicators of capital intensity; for example:

i) Labour–output ratio.
ii) Capital–labour ratio.
iii) Value added per worker.
iv) Capital–output ratio.
v) Value added per unit of capital.

None of these are perfect for measuring capital intensity and discussion

Table 1.3

Peninsular Malaysia: Value added and Employment for 1959, 1963 and 1968

Industry	Value Added ($'000)			Employment full and part–time workers per year			Annual Growth Rate of Value Added (1963-68) %	Annual Growth Rate of Employment (1963-68) %
	1959	1963	1968	1959	1963	1968		
Food	103877.4	121935.8	251947.8	10694	13817	18937	12.8	5.4
Beverages	19636.2	24637.7	65221.2	1898	2221	2313	17.6	0.6
Tobacco Products	21698.4	53315.1	102708.6	3155	3925	4055	11.5	0.5
Textiles	-	7624.5	35131.3	-	1364	5079	28.9	24.5
Footwear &Wearing apparel	-	7471.7	13802.2	-	1240	3469	10.8	18.7
Wood Products	64175.1	92739.6	169850.7	8570	12028	19536	10.6	8.4
Furniture and Fixtures	6610.9	15045.3	18559.4	1154	2431	2777	3.6	2.2
Paper and Paper products	-	5784.9	11185.3	-	612	1432	11.6	15.2
Printing, Publishing and Allied Industries	32595.3	55269.8	94528.8	4228	6938	9510	9.4	5.4
Leather and Leather Products	-	1254.7	1787.8	-	196	346	6.08	9.9
Rubber Products	28624.5	43432.1	91622.3	5485	6883	8434	13.2	3.4
Chemicals and Chemical Products	28645.9	79216.9	142942.4	2073	4063	5746	10.3	5.9
Non-Metallic Mineral Products	24986.4	51873.6	111079.1	2710	4950	7213	13.5	6.4
Basic Metal Industries	-	6771.7	38107.9	-	727	3061	33.4	27.1
Metal Products	18064.2	42896.2	70120.5	2508	5350	8026	8.5	6.9
Machinery	12622.5	27824.5	45248.2	2225	4181	6007	8.4	6.2
Electrical Machinery	-	8871.7	37375.9	-	634	2143	27.1	22.5
Transport Equipment	30712.1	11269.8	33676.3	2549	1582	3615	20.0	14.8
Plastic Products	-	3492.5	15052.2	-	588	1911	27.6	21.7
All other [1]	20647.9	39530.2	82661.3	3548	1094	1260	-	-

Note: [1] Includes Surgical and Medical Supplies Measuring, Controlling, Laboratory and Scientific instruments, Musical instruments, Toys, Sporting and Athletic goods and product of petroleum. (The industries included in this category varied from year to year)

Source: Department of Statistics, Census of Manufacturing Industries, 1959, 1963 and 1968.

of their weaknesses was extensive. For example, Bhalla[43] highlighted the problems faced when using these indicators.

For the years 1959 and 1963, data on capital (such as value of fixed assets) are unavailable. Hence, for these years, only value added per worker ratios are calculated (see table 1.4).

For the 1959 data, the value added per worker (V/L) measurement shows the chemical and chemical products and food manufacturing to be industries requiring the smallest number of workers; in other words, they are capital–intensive. Likewise machinery, except electrical machinery, and rubber products industries can be classified as labour–intensive. The ranking in the middle range of the scale is very mixed. The reason for the different rankings in each of the three years may be the measurement itself[44]. Another possible cause is the nature of data; it is so aggregated that it groups sub–industries which are labour–intensive together with capital–intensive ones.

In 1963, chemicals and chemical products, electrical machinery and tobacco products were the most capital–intensive industries. The value added per worker showed that textiles, plastic products, footwear, furniture and fixtures and rubber products industries were labour–intensive industries, and this follows the usual perception of these industries in other countries.

For the 1968 data, overall the ranking of capital–labour ratio correlates quite strongly with those of value added per worker. (The Spearman's rank correlation between V/L and K/L is 0.764). Because of the reasonable correlation between the two measurements, capital–labour ratio is chosen as the indicator

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[43] Bhalla, A.S. (ed.), 1981. Technology and Employment in Industry: A Case Study Approach, Geneva, International Labour Office.

[44] See Stern, J.J., 1977. The Employment Impact of Industrial Investment: A Preliminary Report. World Bank Staff Working Paper No: 255, The World Bank, Washington D.C.

Table 1.4

Peninsular Malaysia: Capital-Labour and Value Added Per Worker, 1959, 1963 and 1968

Industry	Value Added per worker ($'000)			Capital-labour ratio
	1959	1963	1968	1968
Food Manufacturing	9.71	8.85	13.33	12.26
Beverages	10.42	11.11	28.19	26.10
Tobacco Products	6.89	13.51	25.32	12.39
Textiles	-	5.59	6.89	10.19
Footwear and other wearing apparel	-	6.02	3.98	2.29
Wood products	7.46	7.75	8.69	5.36
Furniture and fixtures	5.71	6.17	6.71	3.05
Paper and paper products	-	9.43	7.81	9.64
Printing, publishing and allied industries	7.75	7.94	9.9	8.49
Leather and leather products	-	6.41	5.15	4.80
Rubber products	5.21	6.33	10.86	8.47
Chemicals and chemical products	13.89	19.61	25.00	33.63
Products of petroleum and coal	-	-	200.00	341.96
Non-metallic mineral products	9.26	10.53	15.38	23.71
Basic metal industries	-	9.35	12.50	37.67
Metal products	7.19	8.0	8.77	73.51
Machinery except electrical machinery	5.68	6.66	7.52	5.25
Electrical machinery	-	14.08	17.54	15.78
Transport equipment	5.85	7.14	9.34	15.92
Plastic products	-	5.95	7.94	9.88
Other Miscellaneous Industries	5.81	35.71	11.56	9.26

Source: Department of Statistics, Census of Manufacturing Industries, 1959, 1963 and 1968.

of capital intensity. However, there are cases where the rankings between the two measurements are very different, namely the tobacco products and metal products industries. In those cases, the use of capital–labour ratio is chosen because the ranking order of capital–labour ratio is considered much more realistic than that produced by value added per worker.

By 1968, products of petroleum and coal has emerged as the industry with the highest capital intensity. The metal product and basic metal industries have changed from being quite labour–intensive (1963) to very capital–intensive. Chemicals and chemical product and beverage industries have maintained their capital intensity at about the same level.

At the other end of the ranking scale, industries such as footwear, furniture and fixtures, machinery except electrical machinery, wood products and rubber products are still very labour–intensive in 1968.

Food manufacturing and paper and paper products became more labour–intensive; electrical machinery and plastic products became more capital–intensive.

1.2.2.3 Growth Rates

In table 1.3, annual growth rates of value added and employment are calculated for the period 1963 to 1968. Basic metal industries had an extraordinarily high value added growth rate of 33 per cent per annum. Second came textiles with 29 per cent; followed by plastic products and the electrical machinery. Basic metal industries also had the highest employment growth rate of 27 per cent. Interestingly, the three industries just mentioned between them have the second, third and fourth highest employment growth rates.

With the exception of footwear and leather production, in all other industries the growth rate of value added exceeds that of employment.

It is unfortunate that the capital data is unavailable, and hence the increase in value added cannot be linked with increase in use of capital. Growth in the manufacturing sector from 1963 to 1968 required much capital because the industries with highest value added growth rates were capital–intensive industries. One example is basic metal industries which had the highest value added growth rate and proved to be also a capital–intensive industry (ranked 3 in table 1.4).

Lim[45] showed that the rate of employment increase in the manufacturing sector was only half of the increase to value added. This figure is considerably lower than expected by the First Malaysia Plan, 1966-70. Thus, the failure of government planners to observe this empirical evidence allowed over–optimism about the ability of the manufacturing sector to absorb labour. If the annual growth rates of employment and value added had been compared, the planners would have realised that the employment absorption capacity of the manufacturing sector was low[46].

The manufacturing sector, in the period immediately after independence, made a substantial contribution to the economy. It increased its GDP share and recorded the highest employment growth rate. New industries were also introduced. These proved to be "leading industries" in terms of their contribution to value added and employment opportunities. These leading industries were textiles, electrical machinery and plastic products.

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[45] Lim (1973), op. cit, page 150.

[46] In general, Lim's conclusion prevails, but for a few industries, the two growth rates are almost equal, for example the textile, wood products, rubber products and electrical machinery industries. The growth rates in table 1.3 differ from Lim's in time coverage and measurement of growth.

1.2.3 The Period from 1968 to the Present.

1.2.3.1 Macroeconomic performance

The 1970s were a time of rapid growth and structural transformation of the Malaysian economy. The GDP grew at 7.8 per cent per annum during 1971–1980. The government introduced the New Economic Policy (NEP) in 1970 which has twin objectives; poverty eradication and the restructuring of Malaysian society. Rapid economic growth is necessary for successful implementation of the NEP.

The government diversification efforts resulted in structural changes in the economy. Manufacturing grew quickly and new crops (such as oil palm) became increasingly important. The petroleum sector was a big new economic presence.

Both domestic and external demand provided the thrust for the overall expansion of output during the decade. During 1971–75, public sector development expenditure was the main source of growth and provided counter–cyclical stabilisation during years of low exports and private investment. However, external sector demand accelerated during 1976–80 and induced a significant increase in output. Domestic demand also increased considerably providing additional stimulus to growth[47].

Exports grew at 7.6 per cent per annum while domestic consumption grew at 8.4 per cent during 1971–80. Total public investment increased at the rate of 12.6 per cent per annum. While, during 1971–75, a major proportion of public development expenditure was for investment in construction related activities, the major thrust of the public sector effort during 1976–80 was on projects directly connected with the NEP. Private investment grew at about the same

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[47] Fourth Malaysia Plan, page 16.

rate (12 per cent) and was largely stimulated by the expansion of external demand and through the availability of funds (domestic saving and foreign capital).

During the decade, Malaysia's balance of payments position continued to be favourable, despite fluctuation in the world economy and slower economic growth amongst Malaysia's trading partners. The trade balance in the merchandise account recorded a surplus of $ 22 billion for 1976–80 compared with a surplus of $ 4 billion for 1971–75.

The only unfavourable development during this period was the increasing inflationary pressure.

Following the oil price boom in 1979/80, the government embarked on an ambitious expansion programme, driving total capital formation to a peak of 38 per cent of GNP. Although this protected the economy against the global recession in 1981–82, it led to unbalanced growth and to high fiscal and current account deficits.

Expansionary fiscal policy, coupled with a property boom, sustained growth through 1984. However, pressures were accumulating; real wages rose faster than productivity, the real exchange rate appreciated; property prices soared; and total public debt was approaching the same level as GNP.

1985 and 1986 saw Malaysia's deepest recession. The government took drastic measures to pull the economy out of the recession and to correct the imbalances. The recovery began in 1987; the economy grew at 6–7 per cent in 1988 and growth was led by the manufacturing sector. This period also saw the result of structural changes introduced over the years – the manufacturing sector overtook agriculture as the main contributor to GDP. However, the recovery may be short–term because it is too dependent on external factors and furthermore domestic private investment is very low and unemployment is high.

1.2.3.2 Structural Change

During 1968 to early 1980s, the manufacturing sector in Malaysia grew quickly, in terms of both output and employment[48], and also its structure changed because of new incentives. The 1968 Industrial Incentive Act encouraged the formation of export–oriented industries. In addition, multi–national companies moved some of their production to lower wage countries, such as Malaysia. Thus Malaysia became a major producer of a few specialised products.

In 1970, the leading sub–sectors in terms of employment were, (in reducing order of importance) food manufacturing, wood products, and printing, publishing and allied industries. In use of capital, the ordering of industries is slightly different from that of employment; it being food manufacturing industries, chemical products, non–metallic and basic metal products.

The manufacturing value added breakdown also showed a similar pattern in 1970. The same is true of the pattern of employment and capital usage (see table 1.5). The largest contributor of manufacturing value added was the food manufacturing industry. More detailed analysis indicates that more than half of the value added is generated by palm oil processing. In recent years, following a concerted effort by the government, Malaysia has become one of the world's largest producers of palm oil. Hence it is encouraging to note that this agricultural product has also become important in the manufacturing sector. Another resource–based industry that has increased its share of value added is rubber products.

The most remarkable change was found in electrical machinery. From being an insignificant contributor of employment and value added in 1970, it became one of the most important in 1979.

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[48] Hoffman and Tan (1980), op. cit.

Table 1.5

Peninsular Malaysia: Distribution of Capital, Employment,and Value Added in the Manufacturing Sector for the years 1970 and 1979 (in percentages)

Industry	1970			1979		
	Capital	Employment	Value Added	Capital	Employment	Value Added
Food Manufacturing[1]	13.4	13.0	16.1	20.7	12.5	19.3
Beverages	3.8	1.8	3.6	2.3	1.2	2.5
Tobacco Products	3.1	1.8	7.2	2.1	1.6	2.6
Textiles	4.3	5.3	2.3	10.8	8.9	5.8
Footwear and other wearing apparel	0.8	3.8	1.1	1.2	4.5	1.5
Wood products[2]	4.7	17.4	10.0	9.4	12.2	9.9
Furniture and fixtures	0.4	1.3	0.8	0.7	1.7	0.7
Paper and paper products	1.3	1.7	0.8	1.3	1.4	0.9
Printing, publishing and allied industries	4.8	7.5	6.2	3.3	4.3	3.6
Leather and leather products	0.3	0.4	0.2	0.1	0.2	0.1
Rubber products[3]	4.1	5.6	4.4	6.4	7.2	9.8
Chemical and chemical products	10.7	4.6	9.4	5.6	3.3	6.1
Products of petroleum and coal	6.7	0.3	3.5	1.6	0.1	3.5
Non-metallic mineral products	8.9	1.3	6.9	6.5	3.7	4.1
Basic metal industries	8.1	2.2	2.8	3.1	2.0	2.1
Metal products	3.8	5.2	3.8	3.6	4.5	3.8
Machinery except electrical machinery	1.2	4.6	2.5	2.1	3.4	3.1
Electrical machinery	3.0	2.1	2.8	8.4	17.4	12.5
Transport equipment	3.5	3.2	3.1	5.2	3.6	3.6
Plastic products	1.7	2.8	1.2	2.5	3.2	1.9

Notes: 1 = Palm oil refining included.
2 = Sawn timber included.
3 = Rubber processing excluded

Source: Department of Statistics, Survey of Manufacturing Industries, 1970,1979.

Table 1.5 also shows how the distribution of capital changed a lot in the manufacturing sector. Industries like food manufacturing, chemical and chemical products, basic metals and non-metallic mineral products, which absorbed the most capital in 1970, had their share of capital lowered in 1979. New industries like textiles, wood products, electrical machinery and transport equipment gained a bigger share of capital. The increased share of capital for textiles and electrical machinery coincides with their increased share of value added. Even though textiles is classified as a labour-intensive industry, its increased share of capital was due to a big increase in production from 1970 to 1979. The same is true of electrical machinery.

Government action in the wood and transport equipment industries is the probable reason for higher use of capital. During the period 1970 to 1978, Malaysia became a major producer and exporter of wood products, (sawn logs and plywood), as a result of opening new logging areas by the government. Through government import substitution policy, local assembly of motor vehicles was encouraged. High tariffs and duties were imposed on imported motor vehicles.

Two industries emerged from virtually nil to positions of importance between 1970 and 1979, namely electrical machinery and textiles. Older resource-based industries such as palm oil processing, wood and rubber products also played a bigger role. As a result the pattern of manufacturing employment, capital and value added was altered.

The above industries are now major providers of employment, use more capital and contribute a big share of value added.

1.2.3.3 Capital Intensity

The capital-labour ratios (table 1.6) show that generally industries have higher ratios in 1979 than in 1970. However, some industries that were very capital–intensive in 1970 have lower capital–labour ratios in 1979, for example non–metallic mineral products, petroleum products and chemical products.

In 1979 when using the capital–labour ratio as the indicator of capital intensity, petroleum and coal products remains easily the most capital–intensive industry in the Malaysian manufacturing sector, albeit with a declining capital–labour ratio. One possible explanation is that while capital has reduced slightly because of depreciation (assuming no new refineries were built), employment has increased. Other very capital–intensive industries are non–metallic mineral products, chemical products and basic metals. The leading industry in non–metallic mineral products is cement and in chemical products the leaders are fertilizers and pesticides. All of these processes are usually accepted as being very capital–intensive.

The industries identified in 1979 as being capital–intensive do not differ from those identified in the period 1959 to 1968. Similarly the industries identified as being labour–intensive in 1979 are more or less the same as those identified in 1968. They are; footwear and wearing apparel, wood products, furniture and fixtures and machinery.

Electrical machinery, in 1979, has become very labour–intensive (in 1970, its ranking was in the middle of the scale). The reason is the establishment of electrical and electronic components firms whose main activity is assembly of components, using large numbers of unskilled female workers[49]. Thus, the electrical and electronic components industry is, at first sight, a case of successful industrialisation. This industry has increased its output and its contribution to manufacturing value added and at the same time, has provided employment.

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[49] See Cheong K.C. et al, 1981. "Comparative Advantage of Electronics and Wood-Processing Industries in Malaysia", Comparative Advantage of Manufacturing Industries Series No.7, Institute of Developing Economies, Tokyo, page 48.

Table 1.6

Peninsular Malaysia: Capital-Labour and Value Added Per Worker for 1970, 1975 and 1979

Industry	Capital-labour ratio			Value-added per worker		
	1970	1975	1979	1970	1975	1979
Food Manufacturing	14	23	25	17	22	27
Beverages	28	26	28	28	34	35
Tobacco Products	23	14	20	55	23	28
Textiles	11	22	18	6	7	11
Footwear and other wearing apparel	3	4	4	4	5	6
Wood products	4	12	12	8	8	14
Furniture and fixtures	4	8	6	8	7	7
Paper and paper products	10	3	14	7	11	12
Printing, publishing and allied industry	9	10	12	12	12	14
Leather and leather products	10	4	6	7	5	7
Rubber products	10	13	13	11	15	23
Chemicals and chemical products	31	28	26	28	25	31
Products of petroleum and coal	288	196	188	161	158	471
Non-metallic mineral products	90	42	27	72	14	19
Basic metal industries	49	30	24	18	16	19
Metal products	10	12	12	10	11	14
Machinery except electrical machinery	3	8	9	8	13	16
Electrical machinery	19	8	7	18	13	12
Transport equipment	14	10	22	13	10	17
Plastics	8	12	12	6	7	10
All Manufacturing	13	15	15	14	13	17

Source: Department of Statistics, Survey of Manufacturing Industries, 1970, 1975, 1979.

The reverse trend is shown by rubber products, plastic and machinery, where new technologies probably required more capital. This is especially true in the machinery industry where one of the main activities is the manufacture of air–conditioners.

The second indicator for capital intensity is Lary's index, that is value added per worker. Like the capital labour–ratio, this indicator also shows that petroleum and coal industry is the most capital–intensive. Another observation linking labour–capital ratio and value added per worker is that they are both moving in the same direction. In other words, if the capital–labour ratio indicates that an industry has become more labour–intensive, the same trend can be detected in the value added per worker, which falls.

The two capital intensity indicators; namely capital–labour (K/L) and value added per worker (V/L) ratios have a strong correlation. For 1979, the

Spearman's correlation coefficient between K/L and V/L is 0.84. The two indicators showed a similar direction and ranking position. Hence either one of the indicators can be used as measure of capital intensity.

1.2.3.4 Wage and Non-Wage Share of Value Added

Another characteristic of the manufacturing sector that confirmed the relative importance of capital is the share of wage and non-wage components in industries' value added. Table 1.7 refers. For most of the industries, the non-wage share is greater than that of wage in all the four years selected; 1970, 1979, 1985 and 1988. The exceptions are textiles, footwear, furniture, wood products, painting and leather products. Even in those industries, the non-wage and wage shares were about the same; wage was much greater than non-wage in none of the industries.

Although the high non-wage share of value added has shown that capital contribution is greater than labour and the capital-labour ratio is increasing (as shown in the previous section), the share of non-wage value added vis-a-vis wage share only increased slightly over the period 1970-1988 (see table 1.7). About half the industries still have wage share of more than 30 per cent of the value added. The rapid structural transformation experienced by the manufacturing sector in the 1980s did not result in drastic change in the pattern of wage and non-wage contributions, as shown by the marginal increase of the latter.

The largest non–wage share in value added can be found in petroleum products, tobacco, beverages and non–metallic mineral products industries.

The unchanged pattern of value added share proves that capital contribution is important in Malaysian manufacturing between 1970 and 1988.

1.2.3.5 Comparison of Growth Rate

The manufacturing sector output grew quickly during the period 1970 – 1979. Most industries registered growth rates of at least 8 per cent per annum

Table 1.7

Peninsular Malaysia: Wage and Non-Wage Share of Value Added, 1970, 1979, 1985 and 1988 (in Percentages)

Industry	Share of Value added							
	1970*		1979		1985		1988	
	Wage Value Added	Non-Wage Value Added	Wage Value Added	Non-Wage Value Added	Wage Value Added	Non-Wage Value Added	Wage Value Added	Non-Wage Value Added
Food Manufacturing	21	79	16	84	24	76	21	79
Beverages	19	81	16	84	19	81	20	80
Tobacco Products	14	86	16	84	11	89	15	85
Textiles	40	60	30	70	49	51	34	66
Footwear & other wearing apparel	47	53	47	53	57	43	48	52
Wood products	44	56	33	67	53	47	39	61
Furniture and fixtures	48	52	50	50	52	48	49	51
Paper and paper products	34	66	32	68	34	66	29	71
Printing, publishing and allied industries	37	63	39	61	42	58	45	55
Leather and leather products	30	70	39	61	48	52	45	55
Rubber products	38	62	18	82	31	69	22	78
Chemicals and chemical products	20	80	20	80	26	74	22	78
Products of petroleum and coal	12	88	4	96	11	89	15	85
Non-metallic mineral products	24	76	26	74	24	76	21	79
Basic metal industries	29	71	30	70	30	70	28	72
Metal products	38	62	29	71	41	59	39	61
Machinery except electrical machinery	48	52	31	69	47	53	31	69
Electrical machinery	26	74	31	69	36	64	34	66
Transport equipment	35	65	32	68	37	63	21	79
Plastics	36	64	31	69	35	65	32	68

Note: * = The 1970 data is taken from Tan,T.N., 1973. Import-substitution and Structural Change in the West Malaysian Manufacturing Sector 1959-1970, M.Ec Thesis, University of Malaya, Appendices V and VI, pages 308-310.

Source: Department of Statistics, Survey of Manufacturing Industries, ,1979, Industrial Survey, 1985, 1988.

while some industries like electrical machinery and rubber products grew at 35 and 28 per cent respectively (table 1.8). The output growth was accompanied by growth in capital and labour. Usually capital had a higher growth rate than labour but exceptions can be found in quite a few industries, namely tobacco production, leather products (which has a negative capital growth rate), chemical products, non–metallic mineral products, basic metal products and electrical machinery.

Table 1.8

Peninsular Malaysia: Growth Rates of Labour, Capital and Output, 1970 - 1979

Industry	Rate of Growth (1970 - 1979)		
	Labour	Capital	Output
Food Manufacturing	10.3	17.3	17.3
Beverages	6.4	6.5	9.8
Tobacco Products	9.5	7.8	2.3
Textiles	14.5	23.1	22.1
Footwear & other wearing apparel	12.4	17.6	16.2
Wood products	6.8	10.5	13.7
Furniture and fixtures	13.8	16.8	9.3
Paper and paper products	8.6	12.1	13.3
Printing, publishing and allied industries	4.7	8.2	8.2
Leather and leather products	3.4	- 0.9	2.2
Rubber products	13.6	17.4	28.3
Chemicals and chemical products	7.2	5.2	9.7
Products of petroleum and coal	1.6	9.7	19.4
Non-metallic mineral products	22.7	8.7	11.6
Basic metal industries	9.4	2.0	12.9
Metal products	9.1	11.8	13.2
Machinery except electrical machinery	7.4	18.6	17.4
Electrical machinery	36.6	24.5	25.4
Transport equipment	12.1	16.8	12.3
Plastics	12.2	16.6	19.7

Source: Department of Statistics, Survey of Manufacturing Industries, ,1970, 1979.

Even though capital generally outgrew labour, there were several industries where the opposite was true and which may therefore have been major sources of employment, namely chemical products, non–metallic mineral products, basic metal industries and electrical machinery. (The labour growth of electrical machinery, which was at a phenomenal rate of 37 per cent, was 2 points more than its output growth rate. This industry also has the highest capital growth rate.)

The main feature of the period 1968 to 1979 was the establishment of a small number of industries that quickly become very important in terms of output, value added and employment. These industries developed because of government incentives (electrical and electronic components), or demand and market factors (textiles, cement, plastics) or the availability of raw materials (palm oil manufacturing, wood products and rubber products).

1.3 Import Substitution and Export–oriented Industries

Industrial development is influenced by trade regimes, such as incentives, tariffs, taxes and quotas imposed by the government. Therefore, it helps to study industrial development by looking at trade categories. This will be done by classifying industries as import substitution or export–oriented[50].

Several measurements have been used for classifying industries as import substitution or export–oriented[51]. In this study we will use a ratio of residual between domestic output and domestic consumption[52].

Statistic: $$T_i = \frac{C_i - P_i}{C_i}$$

where C_i = domestic consumption

P_i = domestic production

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[50] For the explanation of differences between the "export-oriented", "export-promotion", "export-led" and "outer-oriented" concepts, see Mohamed Ariff and Hill, H., 1985. Export-Oriented Industrialisation: The ASEAN Experience, Allen and Unwin, Sydney. For the Malaysian case, the "export-oriented" concept is considered most appropriate.

[51] See for example: Desai, P., 1969. "Alternative Measure of Import Substitution", Oxford Economic Papers (New Series), Vol. 21 and Hoffman, L. and Tan, T.N., 1971. "Pattern of Growth and Structural Change in West Malaysia's Manufacturing Industry 1959-68", Kajian Ekonomi Malaysia, Vol. VIII, December.

[52] Krueger, A.O., Lary, H.B., Mason, T. and Akrasanee, N., (eds), 1981. Trade and Employment in Developing Countries: Individual Studies, Vol. 1, Chicago, The University of Chicago Press for National Bureau of Economic Research.

T_i is then compared with a pre determined value, namely X_i. X_i takes three values: X_0, X_1 and X_2. An industry is classified as export–oriented if $T_i < X_0$; import competing if $X_0 < T_i < X_1$; and non–competing if $X_1 < T_i < X_2$.

The value of X_0 is usually zero. If an industry is an export–oriented one, its production is always greater than consumption. Therefore the industry's Ti will be negative.

The value of X_i varies in the range of 0.5 – 0.99, depending on the degree of disaggregation at which the analysis was conducted. If the industry represents a nonhomogeneous product group, X_i should take a value close to the upper limit.

When the industry is non–competing, X_i would necessarily be 1.0 because there would be no domestic production (i.e $P_i = 0$)

The "T statistic" produces three classifications. The first is "export–oriented", where the growth of output is due to external demand, and the majority of production is for export. The second is called "competing– import" where domestic production can only survive with protection. (These are commonly called import substitution industries). The third is "non–competing imports", where there is no domestic substitute available.

This classification is shown in table 1.9. In 1981, the export–oriented industries were: food manufacturing; tobacco; footwear and wearing apparel; furniture; wood products and rubber products. The first four of the above industries were import substitution industries in 1970. The change in food manufacturing may be caused by palm oil which has become one of Malaysia's major exports. Clothing did the same for the footwear and wearing apparel industry. The wood and rubber products are traditional export–oriented industries (their positions remained unchanged from 1970) their main exports being sawn timber and rubber tyres and tubes respectively.

Ariff[53] calculated the source of manufacturing growth using Hoffmann and Tan's method. The resulting categorization of industries according to source of growth is slightly different from that in table 1.9. For example, Ariff identified rubber products as non–competing whereas it is export–oriented according to the " T statistic". One possible reason for the difference is that Hoffmann and Tan use the difference between two periods while the "T statistic" does not.

Some of the classifications in table 1.9 raise further questions. For example, it is a popular belief that textiles is an export–oriented industry but it is identified here as import–competing. Two explanations may be put forward. The first one is that the textile industry's imports are actually twice its exports; the industry has to import much of its intermediate input (equipment, fibres, cotton). Hence, the overall result, after taking into account the difference between exports and imports, is that the industry is competing–imports rather than export–oriented. The second explanation is the level of disaggregation. The industries presented so far are very aggregated and within some industries very different tradeable products are grouped together. Batek making and knitting mills products are for export while dying, bleaching and printing and natural fibre spinning products are for domestic consumption. Further examples can be found in food production; most of the items under this category are either imported (butter, dairy products) or produced for local consumption (biscuit, rice). But the biggest value item in this industry is palm oil which is mainly for export. If export–oriented palm oil is removed, the remaining food production industry will be import substitution.

Another example is the electrical and electronic industry. Malaysia is one of the largest exporters of electronic components, especially semi–conductors.

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53 Mohamed Ariff, K.A., 1974. "Industrialisation in Peninsular Malaysia: An Empirical Analysis of Import Substitution and Market Expansion" in Suzuki. N (ed), Asian Industrial Development, Proceedings of the Symposium in Appraisal of Import Substitution and Prospects of Export Oriented Industrialisation with Special Reference to Southeast Asia.

Table 1.9

Peninsular Malaysia: Classification of Industries According to Trade Orientation

Industry	1970		1981		T Statistic			
	Output	Domestic Consumption	Output	Domestic Consumption	1970		1981	
Food Manufacturing	843.56	1251.17	10042.92	7370.53	0.325	C	-0.362	X
Beverages	79.09	88.45	717.32	737.78	0.105	C	0.027	C
Tobacco Products	274.66	247.82	958.17	883.81	0.108	C	-0.084	X
Textiles	97.69	272.35	1477.59	1739.29	0.641	NC	0.150	C
Footwear and other wearing apparel	39.52	45.27	720.78	288.28	0.127	C	-1.500	X
Wood products	329.95	272.86	2809.44	1170.54	-0.209	X	-1.400	X
Furniture and fixtures	28.48	33.95	286.02	247.22	0.161	C	-0.156	X
Paper and paper products	34.23	125.07	323.79	761.09	0.726	NC	0.574	NC
Printing, publishing and allied industry	143.53	163.84	898.54	961.23	0.123	C	0.065	C
Leather and leather products	7.30	8.81	25.66	28.55	0.171	C	0.101	C
Rubber products	119.52	109.62	1341.52	1236.52	-0.091	X	-0.085	X
Chemicals and chemical products	275.39	489.61	1625.06	3210.26	0.797	NC	0.493	NC
Products of petroleum and coal	173.17	231.15	4120.73	5935.43	0.564	NC	0.308	NC
Non-metallic mineral products	148.05	169.08	1599.34	1776.04	0.124	C	0.099	C
Basic metal industries	104.95	290.89	994.69	2292.29	0.639	NC	0.566	NC
Metal products	140.46	223.40	1343.42	1646.77	0.371	NC	0.184	C
Machinery except electrical machinery	73.63	418.73	978.51	3383.07	0.824	NC	0.711	NC
Electrical machinery	96.16	200.65	4535.87	5153.04	0.521	NC	0.119	C
Transport equipment	127.23	505.22	1292.82	2983.32	0.748	NC	0.566	NC
Plastics	39.45	40.97	595.93	597.31	0.037	C	0.002	C

Note: 1. The output and domestic consumption data is in million $. The 1970 data is taken from Tan, T.,N., " Import Substitution and Structural Change in the West Malaysian manufacturing Sector 1959-1970", M.Ec. Thesis, University of Malaya, 1973,(unpublished) Appendix V &VI, p 308-310. The consumption data for 1981 is taken from Survey of Manufacturing Industries, 1981 and Annual Statistics of External Trade for Peninsular Malaysia, 1981, both published by the Malaysian Department of Statistics.

2. X = Export-oriented industry NC = Non-competing imports industry C = Competing imports industry

Source: Department of Statistics, Survey of Manufacturing Industries, 1970,1979; Census of Manufacturing Industries., 1981, Annual Statistics of External Trade for West Malaysia; 1981,vol I and II.

Yet when this trade is aggregated with others like household electrical goods and cables and wires, they turn the industry into an import–competing one. Another often forgotten fact is that imports are very high for the electrical and electronics industry; in fact higher than exports. Many components for household electrical goods are imported, and then assembled here. Thus it is reasonable to suggest that overall the electrical and electronic industry is an import substitution one.

Classification of the petroleum and coal industry needs explanation. It is felt that the 1970 classification as a non–competing import industry is correct. However, the 1981 "T Statistic" shows that it should be an import competing one. We feel that the classification should remain as in 1970. The reason for the change in the "T" value is that during the early 1980s, the government increased the production of oil in order to finance its increasing expenditure. Thus the numerator in the "T Statistics" became smaller.

Although this "T statistic" has produced results that are different from other studies, it is still preferred because it only uses the difference between domestic consumption and production. Its weaknesses lie in the aggregative nature and in the difficulty of matching trade (exports and imports) classifications with those of industrial sectors.

Analysis will be made at a more disaggregated level in chapters 6 and 7, to give better insight into the two industries selected for more detailed study, namely textiles and electrical/electronic.

1.3.1 Capital Intensity of Import Substitution and Export–oriented Industries

On average, export–oriented industries have lower capital–labour ratios than import substitution ones (see table 1.10). However, the distribution of these ratios for export–oriented industries is rather extreme. Three out of the six export–oriented industries have quite high ratios while the other three are very low. Footwear and wearing apparel industry, one of the export–oriented ones, is the most labour–intensive industry in the Malaysian manufacturing sector. High labour intensity in export–oriented industries is consistent with the factor proportion theory and is expected because Malaysia's competitive advantage is supposedly her lower labour cost. This labour advantage makes the wearing apparel, wood products and furniture industries very competitive in the world market.

The distribution of the import substitution industries' capital–labour ratio is much more balanced. Most of these ratios lie between 10.0 and 20.0 (table 1.10). Among these industries electrical and electronic machinery has the second lowest capital–labour ratio, probably because the main product of this industry is semi–conductors where certain steps in the assembly process, as recently as 1983, could be done manually. On the other hand, there are import substituting industries which are very capital–intensive. These are the non–metallic industry (the main product is cement, of which freight is a high proportion of cost) and the beverages industry (activities like distilling and bottling require a high input of capital).

Most non–competing import industries have a high capital–labour ratio, because of the high technology used in production. Usually imported technology is used, for example in motor vehicle assembling, manufacturing of machinery, and iron and steel.

When comparing the 1983 capital–labour ratios with those of 1979 (tables 1.6 and 1.10), the general trend is upwards. Only a few industries, such as textiles, clothing, furniture and leather have become less capital–intensive. However, the share of labour and capital in output gives a slightly different picture. Labour share rose except for machinery industry. For capital share the movements are a bit mixed. For those industries that have become more labour–intensive only textiles and leather registered a lower share of capital. Surprisingly some industries which showed a higher capital–labour ratio like paper products, non–metallic mineral, basic metal and transport equipment, have a lower share of capital.

The increase of labour share should be interpreted with care because during the period 1970 to 1979, wages in the manufacturing sector increased on average at 6 per cent per annum[54]. Hence the increased share may not be as high as the data shows because this increment is affected by both the number of workers and increased wages. The answer to the conflicting trends of capital share (in which some industries have a decreased share) and the higher capital–labour ratio lies in the variables used in the measurement. For the capital–labour ratio, labour is measured by the number of workers per year whereas in calculating the share of labour, wages paid is used instead.

Table 1.10 shows another measurement of capital intensity, namely, the value added per worker. When this ratio is ranked and then compared with the ranked capital–labour ratios, the result is similar to that in section 1.2.2 (the period 1957 to 1968).

In summary, it was shown that export–oriented industries performed better than import–substituting ones in terms of employment creation. Export–oriented industries had lower capital–labour ratios. Thus, it seems that the switch of industrialisation policy from import substitution to export–oriented is justified.

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[54] See Soon, L.Y., 1986. Wages and Labour Welfare in Malaysia: An Analysis of the Impact of Export-led Industrialisation, Faculty of Economics and Administration, University of Malaya, Kuala Lumpur, unpublished.

Table 1.10
Peninsular Malaysia: Comparison Between Capital Intensity, Share of Labour and Capital, in Output and Trade Orientation of the Manufacturing Industries, 1983.

	Capital-Labour ratio	Value-added Per Worker	Share of Output		Trade Orientation
			Labour %	Capital%	
Food Manufacturing	36.31	20.68	3.4	25.1	X
Beverages	50.89	44.58	9.8	58.2	C
Tobacco Products	33.48	58.36	4.4	22.2	X
Textiles	15.22	8.67	13.3	46.9	C
Footwear and other wearing apparel	4.37	5.47	18.6	26.2	X
Wood products	13.91	10.08	14.1	41.8	X
Furniture and fixtures	7.55	7.85	19.8	38.1	X
Paper and paper products	26.41	14.11	11.2	63.8	NC
Printing, publishing and allied industries	14.93	19.92	19.9	36.8	C
Leather and leather products	10.34	9.68	11.6	38.9	C
Rubber products	23.24	20.61	11.4	50.8	X
Chemicals and chemical product	33.19	32.44	8.2	35.3	NC
Products of petroleum and coal	282.91	142.29	0.7	14.4	NC
Non-metallic mineral products	44.13	22.29	5.9	41.6	C
Basic metal industries	52.98	27.92	4.4	30.6	NC
Metal products	19.31	16.38	10.7	36.4	C
Machinery except electrical machinery	15.00	17.89	12.5	29.5	NC
Electrical machinery	11.87	13.69	9.5	21.6	C
Transport equipment	23.73	22.47	11.4	39.8	NC
Plastics	15.51	11.01	12.1	47.9	C

Note: X = Export-oriented industry   C = Competing imports industry
NC = Non-competing industry.

Source: Department of Statistics, Survey of Manufacturing Industries, 1983.

Chapter 2

TRADE POLICY

2.1 Introduction

The comparative advantage theory is a logical and convincing reason to encourage trade between countries. A country should concentrate on producing and trading goods which it has in abundance. Goods are thus produced efficiently and trade grows. The effect is a corresponding increase in a country's output and economic growth.

However, for many countries achieving independence in the past 40 years the opposite concept, that economic growth could be obtained without external dependence, also had its attraction and many of them adopted an import substitution strategy. Trade policies were used to encourage domestic production; the most common instrument being import tariff.

Although countries pursuing an import substitution policy initially achieved growth, it could not be sustained especially after the "easy–import substitution" phase[1] . There were also some negative aspects of the strategy; protected inefficient industries, distortions in resource allocation and heavy dependence on imported inputs.

Because of these shortcomings countries then began to look for another strategy that could offer sustained economic growth. Export–oriented strategy

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[1] "Easy-import substitution" is usually associated with setting up of industries that produce basic consumer goods.

proved in many cases to be the answer[2]. Its main instruments are the antithesis of import substitution — minimum protection and liberalisation of exchange rates. Malaysia has followed this course to an extent.

We begin the chapter by noting the various trade instruments. Section 2.2 examines trade instruments to identify the pattern and degree of import substitution and export–orientation. Among the instruments discussed are tariff, exemption from import duties, duty drawback facility, import restriction and quota and exchange rates. Section 2.3 analyses the changes introduced in trade strategy since Independence in 1957. The analysis shows that trade policy was initially used to promote import substitution but was later liberalised to encourage exports. This change took place quite easily because the degree of protection was not extreme. The effects of trade policy on employment are then examined through its influence on the cost of factors of production. Section 2.4 quantifies this effect on the cost of capital.

Since the effects of trade policy are analysed only through changes in cost of capital, a discussion on Malaysian labour is provided for reference in section 2.5. The Malaysian labour market is found not to be very competitive. Wages do not generally respond to market forces and real wages have been increasing. Changes in capital and labour costs will influence the demand for labour through the relative factor price mechanism.

2.2 History of Malaysian Trade Policy

Bruno[3] suggested that countries develop according to a trade pattern which has five phases:

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[2] Examples of economic success through export-oriented strategy are found in Asian Newly Industrial Countries and Brazil.

[3] Bruno, M., 1978. "Short-Term Policy Trade-Offs Under different Phases of Economic Development" paper presented to Symposium on "Past and Present of the World Economic Order", Stockholm, August 25-27.

Phase I – Imposition of quantitative restrictions on imports.

Phase II – Quantitative restriction is still an important instrument for protection but the control mechanism becomes complex and is supported by supplementary price measures, tariffs and export rebates. Even when there are export subsidies, the effective exchange rate on exports is always lower than on imports, which are highly protected.

Phase III – Rationalisation of import tariffs; some tariff subsidies are replaced by formal parity changes. These may take the form of a devaluation–cum–liberalisation package accompanied by external grants to facilitate expansion of imports.

Phase IV – This a successful culmination of Phase III liberalisation efforts. There is much greater uniformity of incentives. Inter alia, the effective exchange rate on exports is equated to that on imports.

Phase V – There is full convertibility on current account and no quantitative restrictions. There is a pegged exchange rate in equilibrium or a flexible rate regime. Monetary and fiscal policy are employed as instruments to achieve payments balance, instead of reliance on an exchange control mechanism.

Because of the nature of its economy, Malaysia did not strictly follow this pattern. Even before Independence, Malaysia was an open economy and much of its development was attributed to trade. During the pre–Independence period the mainstays of the Malaysian economy were its primary commodity exports – rubber and tin. Imports, especially from the United Kingdom were easily available. Since the pre–Independence period Malaysia continues to be an open economy, for example in 1986 exports were equal to 57 per cent of Gross Domestic Product while imports were 51 per cent.

This open–ness, especially in the pre–Independence period, resulted in tariffs being charged at a minimal level, mainly for revenue purposes. However, after Independence (1957), tariffs were regarded as a tool to promote industrialisation. Very few quantitative restrictions were used. Tariffs were mostly for import substitution goods. Malaysia started its export–oriented industrialisation after 1968. This was done by giving fiscal incentives to new investments and encouraging specific industries (which were different from the existing import substitution ones). Reduction of tariffs was done very gradually. There was no liberalisation of the foreign exchange rate to help export promotion because it was already relatively free from government interference.

Because the tariffs in Malaysia are quite moderate when compared with other developing countries, the transformation of its trade pattern from import substitution to export promotion took place quite differently from Bruno's phase II. However the import substitution control mechanism did in certain cases resemble that of phase II; there were supplementary price measures, government purchasing policy and export rebates. There was no rationalisation of tariffs nor liberalisation of imports. Exchange rates were never restricted. In fact, to a certain extent we can say that export–oriented industrialisation co–existed with import substitution. The export–oriented industrialisation policy was more like Singapore's, in that only fiscal incentives were given. Policy never reached the Taiwanese or South Korean level of direct and substantial government intervention.

In the early 1980s, the Malaysian government introduced a new industrialisation policy based on heavy industries, and directly funded the establishment of steel plants and factories. Under this second round of import substitution very high protection was given to the relevant products.

To explain these broad trends, we need to analyse the trade instruments used. The main one is tariff (import duty). The protection effect of tariff can be measured by nominal and effective protection rates.

The non–tariff instruments include exchange rate, quantitative restriction and others like price supervision, local content quota and government purchasing criteria. The last group of instruments (price supervision, local content quota and government purchasing criteria) will not be discussed because it is difficult to quantity their effects and their role in providing protection for local industries is thought to be minimal.

2.2.1 Tariff

This discussion on tariff includes exemptions from import duties, duty drawback and refund of duty. It notes the institutions that have the power to impose tariffs or give exemption and the quantum and trend of import duties.

2.2.1.1 Tariff Institutions

Before Independence minimal tariffs were levied, mainly for revenue purposes. Protection for manufacturing industries was limited to products not competing with imports from Britain.

After Independence, tariffs were used as a tool for promoting industrialisation. For this purpose the government established in 1959 the Tariff Advisory Committee (TAC). TAC was not a statutory body and its seven members were mostly from the private, commercial and industrial sectors. Its principal function was to investigate individual applications for tariff protection, tariff exemption on raw materials and duty drawbacks, and advise the Minister of Commerce and Industry accordingly. As a result of the TAC formation, the number of items which were accorded protective rates increased from 25 (1962) to more than 200(1963)[4]. The tariff schedule was reclassified and a number of Commonwealth preferences eliminated.

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[4] Most of the discussion in this section is taken from Lee, K.H., 1986. "The Structure and Causes of Malaysian Manufacturing Sector Protection", in Findlay, C. and Garnaut, R., The Political Economy of Asean and Australia, Allen and Unwin.

Following the 1963 merger of Malaya and Singapore to form Malaysia, the Tariff Advisory Board (TAB) was established. TAB became operational and replaced the TAC in the latter part of 1964. Its principal functions were:

(i) to advise the Federal Government on the establishment of a common market in Malaysia for all goods and products produced or manufactured in significant quantities in Malaysia;

(ii) to advise the Federal Government on the establishment and maintenance of a common tariff or protective duties for the protection of products for which there is to be a common market.

With the separation of Singapore from Malaysia in 1965, an Action Committee on Tariff (ACT) was set up to advise the Malaysian government on the economic implications of the separation and on tariff matters. The committee was later reconstituted as the Action Committee on Tariff and Industrial Development (ACTID). Though not constituted by any statute of Parliament, it possessed extensive powers of jurisdiction above those of the TAB and it was in fact serviced by the TAB. ACTID's function was primarily to consider individual applications for tariff protection, import duty exemption, duty drawback on raw material and component parts, and import restriction. Its tasks were later extended to include consideration of pioneer status applications, export incentives and almost all matters related to industrial development. ACTID had more power and processed applications faster than TAB.

The effect of TAB and ACTID could be seen by the changes introduced to tariffs. From 1962 to 1970, 396 new tariffs were introduced, and rates on 274 of the 811 tariffs existing in 1962 were increased. By contrast, tariff rates were lowered for only 92 items and sub–items during this period.

In 1969, the Capital Investment Committee (CIC) was formed. Its members were cabinet ministers, and its tasks were to set tariff policy, to impose protective duties on existing products, and to set tariffs to protect products that had not yet been produced. It was also to be the supreme authority responsible for overall policy for investment and industrialisation in Malaysia. Its functions were[5]:

(i) reviewing current policies and programmes of industrial development at federal and state levels, where there existed an apparent lack of coordination, (individual states were continuing to set up their own industrial estates and competing among themselves for investment), with the view to coordinate them into an integrated programme of accelerated industrial development, particularly of labour intensive and export–oriented industries;

(ii) identifying development priorities, guidelines and incentives for effective establishment of these labour intensive and export–oriented industries; and

(iii) streamlining existing government machinery in order to speed up decision making on industrial development.

The powers of CIC far exceeded those of TAB and ACTID and in 1970 the latter two bodies were disbanded. However, new bodies were needed to take over their functions and a new Tariff Advisory Committee (TAC) and a Special Advisory Committee on Tariff (SACT) were formed under the Federal Industrial Development Authority (FIDA), later known as the Malaysian Industrial Development Authority (MIDA). SACT advised the government on any request which was considered urgent and which concerned measures of protection and

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5 Lee, ibid, page 109

promotion of industries referred to it by the government. The new TAC took over the functions of the disbanded TAB.

In 1971 the CIC ceased to function. SACT is currently one of the two bodies (the other is the Treasury) with power to impose or remove tariffs and duties. Serviced by the Tariff Unit in MIDA, the SACT retains all the former functions of ACTID and has also taken over the functions of the TAB, which the TAC (now quietly forgotten) was supposed to replace. Although the CIC was dissolved, its investment promotion policy remained in the early years of the SACT. The SACT introduced a system of suspended tariffs where a protective duty was announced in advance (to be imposed when production started) for selected industries and thus indicating investment opportunities. With the announcement, an import quota would also be imposed. When the industry was established, the quota would be reduced progressively and the suspended duty would replace it. Later, SACT felt that the system of suspended tariffs had not proved to be an effective means of promoting investment or industrial development and by the middle of the 1970s the system was abandoned.

Since MIDA services the SACT, most applications concerning tariff protection (setting and change), import restriction, exemption from duty and duty drawback go first to MIDA. MIDA can also initiate reviews of tariffs.

2.2.1.2 Tariff Rates

Import duties consist of:

(i) surcharge or surtax on a flat basis;

(ii) import duty based on either a percentage of the c.i.f value (an ad valorem rate) or a fixed amount per unit of goods .

Either one or the other or both can be applied.

Table 2.1

Distribution of Tariff Rates According to the Customs Tariff Schedule ,1979 and 1982

Tariff Rate (% ad valorem)	Number of Items	
	1979	1982
0	1809	1590
1–4	1	416
5–9	42	31
10–19	264	268
20–29	883	829
30–39	202	214
40–49	20	129
50–74	98	75
75+	3	4
Specific Rates	525	450
Total No. of Items	3947	4006

Source: Government of Malaysia/UNDP/World Bank, Malaysian Industrial Policy Studies Project Report No.1., Tariff and Tariff Related Incentives in Malaysia, 1984, unpublished report.

Prior to 1978 a surtax on imports was levied at 3 per cent but after 1978 it became 5 per cent. The distribution of tariff rates in 1979 and 1982 shown in table 2.1 illustrates the tariff levels in Malaysia. In 1979, the largest category of items was that which did not have any tariffs (1809 out of a total 3947 items or 46 per cent). Of those items that had to pay import duties the biggest group (883 items or 22 per cent) fell into the 20 – 29 per cent ad valorem range. Only a small percentage of items (2.5 per cent) paid more than 50 per cent rate.

By the mid 1970s the Malaysian government indicated its intention to reduce the level of protection in order to promote more efficient domestic industries (the Third Malaysia Plan 1976–1980). This is borne out by the direction of changes in tariffs and duty announced in the annual budgets of 1980 to 1988 inclusive. Table 2.1 shows that 2.5 per cent of items were levied at the highest rates (over 50 per cent) in 1979 but this proportion fell to 1.9 per cent by 1982. Some increases of import duty have been made very selectively: (i) for revenue and public health purposes e.g, tobacco and liquor; (ii) for passenger cars as a protective measure in view of the heavy industry policy, i.e the Proton Saga. Overall, the trend has been a reduction, with the exception of certain items.

2.2.1.3 Exemption from Import Duties

Exemption can be either full or partial. The degree of exemption of raw material and machinery depends on whether the finished products are for the domestic or export market. Different conditions apply for raw material and machinery as follows:

Raw Material

Exemption for imported raw material for the companies producing for the local market will not be granted if there is already a local producer of that raw material, regardless of its price or quality. Full exemption from import duty is normally given when :

- final products are made with inputs that have not received exemption
- without the exemption products could not compete against imports.

Partial exemption may be granted in cases where:

- only with partial exemption can the industry concerned compete effectively against imports in terms of cost and can enjoy reasonable profits.

- raw materials/ components undergo very little local processing and therefore receive little value added.

Exemption will also not be given for industries that have adequate protection.

For exporters, even if locally produced inputs are available, exemption can still be given for imported ones if the quality of the local input is inferior to and its price is higher than imports. In this case exporters can claim full exemption from both surtax and import duties. For exporters, exemption is a kind of export subsidy making it more competitive as it can lower production cost.

For companies producing for local markets exemption from duty provides a second level of protection. The first level of protection is from duties levied on competing imports.

Machinery

Criteria for exemption from import duty for machinery are the same for both domestic and export production; they are:

- the machinery must be critical to the production line;
- the machinery is not available locally

Recently the government removed or reduced the duties and taxes on a wide range of machinery items.

2.2.1.4 Duty Drawback Facility

Duty drawback is given on raw material or other inputs used in the production of finished exported goods. There are several conditions to this facility; the two most important ones being: (i) the raw materials and components must be imported by the manufacturer, and (ii) the final products must be exported within twelve months of the date on which the import duty was paid.

Of the two forms of export subsidy (i) exemption from import duty and (ii) duty drawback, the former is more popular. The reason is that drawback involves more procedures and, by definition, the duty has to be paid first and later reclaimed, with an adverse effect on cash flow.

2.2.2 Import Restriction and Quota

In Malaysia, these two trade instruments are not widely used. Import restrictions are classified under three schedules in the Customs (Prohibition of Imports) Order:

(i) total prohibition based on political and moral reasons,
(ii) restriction for the purpose of national security or consumer safety,
(iii) primarily for the protection of Malaysian industries.

Quotas are given on a case by case basis and coordinated through the SACT.

In principle the degree of import restriction or quota is based either on Malaysian industry's expected production capacity or the previous year's imports. In practice, if restriction is the method chosen, imports are usually set at 60 to 70 per cent of the previous year's imports. If a quota is used however, it is based on the capacity rather than the production of the domestic industry and is therefore often more protective of domestic producers.

By any standard, the extent of import restriction/quota is not large. In fact, there has been a move away from quantitative restriction as a form of protection. In 1973 for example, 135 items or 4.2 per cent of the total number of import items were subject to import restriction/quota By 1978 the number had declined to 110, or 2.8 per cent (table 2.2). This trend has continued into the 1980s. In the 1982 budget, quantitative restrictions were retained on only 12 items.

Table 2.2

Classification of Items Subject to Quantitative Restriction, 1973 and 1978

Category	1973 No. of items	%	1978 No. of items	%
Import quotas	119	3.7	100	2.5
Total prohibition	16	0.5	10	0.3
Import licensing	86	2.7	109	2.7
	223		219	
No restriction	2977	93.1	3705	94.5
Total	3200	100	3924	100

Source: Lee(1986), op cit.

2.2.3 Nominal and Effective Protection

Many studies of the structure of protection in Malaysia have been carried out since the mid 1960s; Power[6] , Panchamukhi[7] , Ariff[8] , Edwards[9] , Von

6 Power, J. H., 1971."The Structure of Protection in West Malaysia", in Balassa, B. and Associates, The Structure of Protection in Developing Countries, Baltimore, John Hopkins University Press.

7 Panchamukhi, V. R.,1972. "Effective Protection and Intra-Regional Trade: A Case Study of Malaysia". Bangkok mimeographed, ESCAP Secretariat.

8 Ariff, K.A.M., 1975. "Protection for Manufactures in Peninsular Malaysia", Hitotsubashi Journal of Economics, XV.

9 Edwards, C. B., 1975. Protection, Profits and Policy : An Analysis of Industrialisation in Malaysia, Ph.D dissertation, University of East Anglia, unpublished.

Rabenau[10], Lee[11] and the Government of Malaysia/UNDP/World Bank.[12] There is no complete series of NRP and ERP data from 1960 to the present time. Instead there are rates for selected years extracted from the above studies. Those rates are pooled to form a series from 1963 to 1982 (as the latest NRP and ERP rates available are the ones found in the Government of Malaysia/ UND/World Bank study). The Power and Ariff ERP estimates were chosen to represent the period up to 1970 because their approach is similar (using tariff schedule) to those estimates for the period after 1970.

Comparison of the estimates from these studies must take into consideration the following factors:

- Estimates were calculated for different times, at each of which the incidence of effective protection could be expected to be different as a result of policy changes affecting particular nominal tariff rates, and as a result of a shift in underlying parameters;
- Different methods were used;
- Even when the same time period has been examined, different sources of data have been used.

The nominal rate of protection (NRP)[13] pattern follows the earlier discussion on tariff. The SACT started to take a moderate stand towards tariff only after 1975. Therefore it is understandable that tariff measured by NRP kept increasing from 1963 and only started to fall in 1982 after reaching a peak

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[10] Von Rabenau, K., 1975. "Trade Policies and Industrialisation in a Developing Country: The Case of West Malaysia", Economic Discussion paper, No. 55, Regensburgh, University of Regensburgh.

[11] Lee(1986), op cit.

[12] Government of Malaysia(Economic Planning Unit)/UNDP/World Bank, 1984, Malaysian Industrial Policy Studies, Project Report No. 1, Tariff and Tariff Related Incentives in Malaysia, unpublished report.

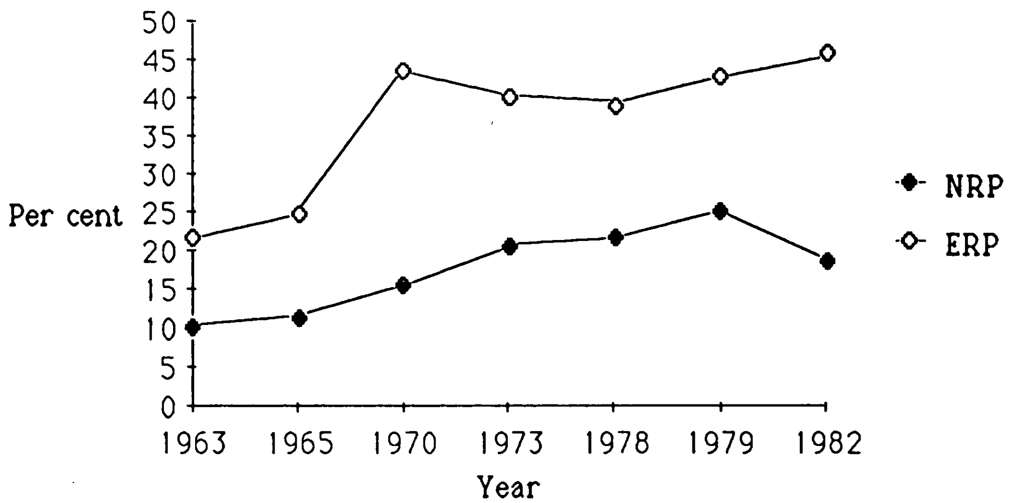
[13] Nominal rate of protection is defined as the percentage excess of the domestic price over the world market price, resulting from the application of protective measures.

of 25.1 per cent in 1979. For effective rate of protection (ERP)[14], the pattern is slightly different. In the period 1973 to 1978 when NRP was increasing, ERP actually declined. However, it rose after that to a second peak of 46.0 per cent in 1982. A possible explanation of this opposite trend lies in the types of goods on which the NRP is levied. If the NRP of inputs is increased, then the industry will experience lower ERP. On the other hand, if NRP is increased on final goods, then the industry will enjoy higher ERP.

There are wide variations of NRP and ERP among industries. For example the lowest NRP is consistently rubber remilling and latex processing while the highest is always tobacco products. The range between the lowest and highest NRP is 93 percentage points in 1963 which increases to 210 in

Figure 2.1

Unweighted Nominal (NRP) and Effective (ERP) Protection Rate of Malaysia



Source: 1963 and 1965 rates from Power (1971), 1970 rates from Ariff (1975), 1973 and 1978 from Lee (1986) and 1979 and 1982 from Economic Planning Unit (1984)

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14 Effective rate of protection is defined as the percentage excess of domestic value added, obtainable by reason of the imposition of tariffs and other protective measures on the product and its inputs, over world market value added.

1978[15]. ERP has an even wider range. The industry with the lowest ERP is always rubber remilling and latex processing. However, the industry with the highest ERP changes from textiles (337 per cent in 1963) to chemical fertilisers (248 per cent in 1970) and to motor vehicles (317 per cent in 1978).

If we look at protection according to major product group, consumer durables is least protected in 1963 but becomes highly protected in 1978. Effective protection for intermediate products with lower levels of processing is consistently far less than that for industries producing intermediate products of higher levels of processing. Lee also showed that importables have a higher ERP than exportables[16].

Malaysia can be considered as belonging to the group of countries with a moderate protection system. The degree of protection is measured through the NRP and ERP rates and the types of instruments used. Malaysia, with the highest average NRP of 25 per cent and ERP of 46 per cent, shares a group with countries like Thailand, Brazil and Ivory Coast. On the other hand, the group with a high protection rate has members such as Tunisia and Pakistan with average ERP rates of 251 per cent and over 100 per cent respectively.[17]

The main instrument used by Malaysia is the tariff system. Countries with a more restrictive system often practice import licensing (Pakistan, Uruguay) and quantitative restriction (Peru, Korea, Tunisia). Uruguay even introduced a system of exchange surcharges to contain the demand for imports.

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[15] For more detailed discussion see Lee (1986), op cit., and Economic Planning Unit, ibid. Lee's discussion included classification by major product groups and resource based sectors. Economic Planning Unit analysis is even more disaggregated - by 5 digit MIC.

[16] See Lee(1986), op cit., page 118 table 4.3

[17] For comparative studies on trade regimes of several LDCs, See Krueger, A.O., Lary, H.B; Mason, T. and Akrasanee, N., (eds), 1981. Trade and Employment in Developing Countries: Individual Studies, Vol. 1, Chicago, University of Chicago Press for the National Bureau of Economic Research.

Most countries adopted a protective trade regime as a response to balance of payments problems (Chile, Korea, Thailand and Uruguay). Malaysia, with a surplus balance of payments, did it to promote import substitution industries. With the advent of export–oriented industrialisation, many countries (Brazil, Chile, Thailand, Korea and Malaysia) lowered their protection rates. Malaysia went a step further in promoting export–oriented industrialisation by giving incentives like duty drawback. Brazil and Thailand also adopted a similar strategy.

In terms of types of products that are given protection, Malaysia resembles most other LDCs; consumer goods are more protected than intermediate and capital goods.

2.2.4 Exchange Rate

A foreign exchange regime can be used to achieve industrialisation objectives, in particular when seeking a move of resources from non–tradables to tradables (import–competing and exports). Devaluation can be considered as a uniform tariff which raises the domestic price of imports. On the other hand, devaluation also acts like a subsidy for exports. Thus, industries producing tradables become more profitable relative to those producing non–tradables. Resources then move to the tradables industries. However, this line of reasoning must be treated with caution. Several qualifications are discussed, for example by Corden (1980)[18].

Up until the late 1960s the Malaysian foreign exchange rate was pegged directly, and within a very narrow band, to the Pound Sterling. In 1967,

[18] Corden, W.M., 1980, "Trade Policies" in Cody, J., Hughes, H and Wall, D. (eds), Policies for Industrial Progress in Developing Countries, Oxford University Press for the World Bank.

Malaysia entered into an agreement with Singapore and Brunei for interchangeability of currencies with Singapore and Brunei. This agreement was abandoned in 1973. In 1975, the exchange rate was "floated" and related to a basket of the currencies of Malaysia's major trading partners.

An analysis of exchange rate can be based on either the nominal or real effective exchange rates. The following discussion is based largely on work done by Gan (1989)[19]. The nominal effective exchange rate (NEER) is the summary of the overall pressure on the Malaysian Ringgit in the foreign exchange market. It can be measured by this index:

$$\text{NEER} = \prod_{i=1}^{n} e_i \, w_i \tag{1}$$

where e_i = number of units of domestic currency per unit of currency $i = 1, 2, \ldots\ldots n$

w_i = weight given to currency i.

Real effective exchange rate (REER) is a summary measure of a country's competitiveness vis–a–vis a select group of trading partners. This measurement takes into account domestic price changes and is calculated by the formula.

$$\text{REER} = \prod_{i=1}^{n} \frac{(e_i \, p_i)^{w_i}}{p_d} \tag{2}$$

[19] Gan, W.B., 1989, "The Ringgit Exchange Rate and the Malaysian", in Lim, K.C. and Mahani, Z.A., (eds). Strategy for Growth: Towards A More Competitive Economy published for the Malaysian Economic Association.

Where P_i = price index of country of i

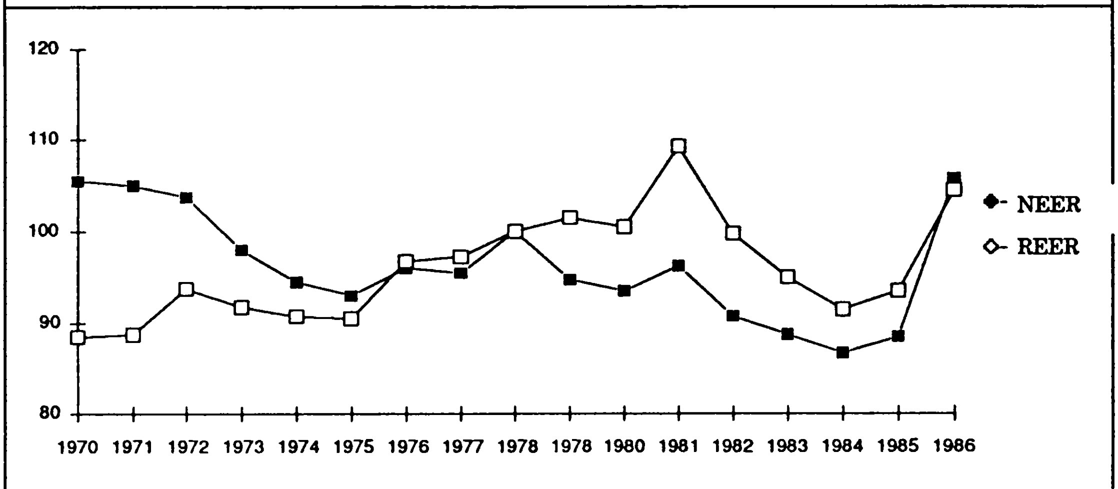
P_d = price index of home country

With the advent of generalised floating, which was first introduced in 1975, NEER showed a steady appreciation of the Ringgit against other currencies until 1985. It depreciated sharply by 18 per cent the following year.

These two measurements show that the exchange rate appreciated during the 1970–1985 period. This affected the competitiveness of the export industries as the price of exports increased. However, Gan found no evidence that the Ringgit had been managed to stabilize the real effective exchange rate in order not to erode too much the country's competitiveness. But if we examine the variability of the Ringgit nominal effective exchange rate (0.0243), it was much smaller than other independently floated currencies such as the US Dollar (0.0342). Thus, the exchange rate system can be characterised as "managed floater".

Figure 2.2

Indices of the Ringgit Nominal and Real Effective Exchange Rate (1978 = 100)



Source: Gan (1989), op cit.
Note: Index is inverse of the value of the Ringgit.

2.3 Trade Policy Changes

The question we want to ask is whether trade policy has helped in the switch from import substitution to export promotion. The answer is to look at changes in tariffs and their effect on export–oriented and domestic–oriented establishments.

Tariffs were quite low after Independence but increased to reach a peak in the CIC period (the early 1970s). Beginning from the mid 1970s, tariff policy took a more moderate turn. The protective tariff policy associated with import substitution was moderated as a pre–requisite for export promotion. This change in tariff policy was reflected in the movement of NRP and ERP. The NRP increased from 10.2 per cent in 1963 to its peak of 25.1 per cent in 1979 and fell to 18.8 per cent in 1982 (figure 2.1). The decrease of NRP is in line with the government policy of promotion of exports which reduced tariffs and surtax and in some cases eliminated the latter. Fewer goods face import restriction now. ERP had a different pattern; it increased from 1963 (21.7 per cent) to 1970 (43.8 per cent), declined to 1978 (39.3 per cent) and increased again to 1982 (46.0 per cent). The latest figure is a little higher than the previous peak and may be due to the very high import tariff of certain goods under the heavy industrialisation policy.

There are several reasons why protection was reduced, and most of them are linked to export promotion. Among them — a need for higher economic growth, diversification, attracting foreign investment, increasing employment and economy of scale. Another equally important reason is that as a country develops there is a need to produce intermediate goods. Less protection for consumer/final goods will direct resources to intermediate goods.

Overall, it can be said that trade measures did help the export promotion strategy but only to a limited extent. Import substitution industries still enjoy a higher degree of protection as indicated by the increased ERP. Even though nominal tariffs are reduced and there is the additional benefit of exemption from import duty and duty drawback, an over–valued exchange rate (shown by a lower value of NEER[20] in figure 2.2) has reduced the benefit to exporters.

A tariff, if any, should be uniform and as low as possible. The market will then decide the geographical distribution of industries, based on comparative advantage. However, uniform tariffs can only be achieved in nominal terms and uniform effective tariffs are almost impossible to get. In Malaysia, most tariffs are made-to-measure. Hence there are some highly protected industries while some others have negative protection. Korea has proved that import substitution and export promotion objectives can be achieved (or maybe accelerated) by made–to–measure tariffs,[21] which provides cross-subsidisation between the two sectors. For example, if export activities were not profitable, the government compensates by setting a very high tariff level. This allowed companies to sell goods locally at a high domestic price. Malaysia's made-to-measure tariffs are not applied in the same manner as Korea's; there is no cross subsidisation and exports quota requirement.

This made–to–measure tariff was successful in Malaysia in promoting import substitution industries. However, Lee[22] found that the pattern or degree of protection has moved resources to inefficient industries. He cited examples like textiles (with ERPs in subsectors ranging from 35 per cent to 120 per cent in 1978), the tyre and tube industry (170 per cent) and the motor vehicle assembly industry (317 per cent). The EPU[23] study found that tariffs favour producers of final goods over producers of inputs and that there are wide variations of rates even within the same industry groups.

In Malaysia, the made–to–measure basis was not only introduced for tariff but for other measures as well, namely exemption from import duty and duty drawback. For domestic markets, the latter two measures do not alter

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[20] A lower NEER value means that fewer Malaysian Ringgit is needed by her trading partners indicating that Ringgit is expensive.

[21] Krueger, Lary, Mason and Akrasanee, (1981), op cit.

[22] Lee(1986), op cit.

[23] Economic Planning Unit(1984), op cit.

the nominal protection of the finished goods. Exemption from import duty and duty drawback are direct fiscal benefits to the recipient of the concession. This reduces the protection effect of similar inputs produced domestically and reduces the incentive for future local production of those inputs. On the other hand, these measures lessen the disincentive to export–oriented industries because the production cost to exporters is reduced.

The most important instrument for export promotion is the exchange rate. Other measures have only limited influence. Direct export subsidies (including exemption from direct taxes on export earnings) are against General Agreement on Tariffs and Trade rules. The export subsidies usually allowed are: subsidised credit, provision of infrastructure, manipulation of input prices and temporary tax holidays and other tax reliefs (if given to both exporting and non–exporting industry). These export subsidies, in particular exemption from import duty and duty drawback, provide an element of free trade. However, export subsidies cannot be given excessively because other countries might retaliate. For most of the 1970–1985 period, the Ringgit was over–valued and its depreciation in 1986 was due to the domestic recession rather than government action. There was almost no intervention from the government because it wanted to maintain a policy of not strongly interfering with market forces. Furthermore the appreciation was not considered excessive.

Some signs can be seen of what is called the Dutch disease during the period of economic expansion (1980–1984)[24] , but this is not due to the improvement in the terms of trade. Government counter–cyclical behaviour has a more dominant effect on the exchange rate than the terms of trade[25] . In an

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[24] The Dutch disease refers to the coexistence within the traded goods sector of booming and lagging subsectors. The increase in real income as a result of the boom, raises the level of real spending in both tradeables and non-tradeables sectors. This raises the relative price of non-tradeable goods which translates into a higher real product wage for the tradeable sector and a lower one for the non-tradeable. This stimulates resource allocation from the tradeable to the non–tradeable sectors. In addition, real currency appreciation caused exports to decline. For further explanation see Corden, W. M., and Neary, J. P., 1982. "Booming Sector and Deindustrialisation in a Small Open Economy", Economic Journal, 92. Also see Gan(1989), op. cit.

[25] Mazumdar, D., 1989. "Labour Markets in Structural Adjustment in Malaysia", Kuala Lumpur, Economic Planning Unit Human Resource Development Project, mimeo.

attempt to sustain a large counter–cyclical expenditure, the government borrowed heavily in the international market. The large inflow of capital led to an appreciation of the Malaysian Ringgit.

Price of non–tradables rose relative to the price of tradables. The manufacturing sector and the rubber and other plantation agriculture, which represents the tradable sector, experienced a decline in the rate of return on capital. On the other hand, the rate of return for the construction and retail sectors (non–tradables) was higher in that period than during 1970s.

The shifts in relative prices and profitability led to reallocation of resources from tradables to non–tradables. This is measured by growth performance. The manufacturing real value grew at 8.5 per cent per annum (1980–1984) compared with 12 per cent per annum for 1974–1979. The non–tradables growth rate was 11 percent per annum for 1980–1984 while in 1974–79, it grew at 8.2 percent per annum.

We see that Malaysian trade policy started with import substitution and later added export promotion. Both policies remain in place in the late 1980s and co–exist successfully. The success of the transition is due to the moderate protection level. For example among ASEAN countries, after Singapore, Malaysia had the lowest average tariff rates (NRP) in 1978[26] . Beside this relatively weak intervention by the Malaysian government, export promotion is also helped by the fact that its exporting industries are completely different from those of import substitution.

So far the success of export–oriented industrialisation has come from relatively few industries. To broaden the coverage, high tariffs on some

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[26] See Mohamed Ariff and Hill, H., 1985. Export-oriented Industrialisation: the ASEAN Experience, Allen and Unwin, page 80. The definition of tariff differs among ASEAN countries. For example, in Malaysia and Singapore tariff refers only to custom duties on imports while in Philippines and Thailand it includes indirect taxes which discriminate against imports. On the other hand, Indonesia defines tariff as import duties and sales tax on imported goods (as a percentage of c.i.f. import values).

products need to be further liberalised since they have a negative effect on export–oriented industries. In this respect Gan[27] found that 60 to 70 per cent of the tariffs originally designed to protect domestic production of manufactured goods are ultimately borne by those producing for export.

In conclusion, we can say that Malaysia has moved from import substitution to export–oriented strategies and that various trade measures have been used to ensure the success of each strategy. However, tariff protection associated with import substitution activities imposed a considerable burden on the export of manufactures.

2.4 Quantifying Trade Instruments.

Trade instruments discussed in the previous sections were; tariff, quantitative restriction, exchange rate, and exemption from import duties. Trade instruments may be administered in such a way that the cost of capital differs between various users. For example, if import of capital is only allowed for import substitution industries, then the cost of capital is cheaper for these industries and more expensive for others. In another example, imported capital may be allowed at a tariff rate much lower than for other imports. In cases such as these capital is relatively cheap when compared to other inputs. As a result, there is a tendency to use capital–intensive production techniques. This section will investigate the effect of each trade instrument on the cost of capital and will quantify it.

2.4.1 Tariff and Quantitative Restriction

We first look at the tariff pattern (nominal and effective) according to end–user (table 2.3).

27 Gan, W.B., 1987. "Transition towards Export-oriented Industrialisation in Malaysia", paper presented at the National Centre for Development Studies Conference on Export-oriented Strategies in Developing Countries, Canberra, August 31 - September 4

Table 2.3

Nominal and effective rates of protection by product group: Malaysia

	Nominal							Effective						
Product Group	1963*	1965*	1970	1973*	1978*	1979	1982	1963*	1965*	1970	1973*	1978*	1979	1982
Processed food	9	11	-	17	17	13	9	6	7	-	17	24	24	9
Beverages and tobacco	21	46	-	160	147	188	79	17	73	-	105	44	-194	111
Construction materials	6	7	11	17	8	15	16	7	9	73	4	23	17	19
Intermediate products I	4	4	-4	3	5	25	22	8	9	-19	-7	0	47	36
Intermediate products II	14	13	11	21	24	26	27	27	25	52	43	42	69	63
Nondurable consumer goods	14	14	12+	28	24	26	22	19	20	17+	42	85	49	43
Consumer durables	1	-	126	55	55	40	37	-11	-5	103	194	173	151	165
Machinery	5	5	20	29	22	19	15	6	6	64	83	39	34	29
Transport equipment	-	-	25	1	0	12	12	-	-	164	-7	-5	11	12

Notes: * = Estimates on free coefficient + = Includes processed food

- = Not available or included in another category

No recent estimates of ERP (later than 1982) is available.

Source: 1963, 1965, 1970, 1973 and 1978 from Lee (1986). 1979 and 1982 are based on the NRP and ERP figures by EPU (1984).

The classification of end–user in that table is based on the one used by Power (1971). For the 1979 ERP estimates, there are a few end–users with very big negative values and they changed to big positive values in 1982. An ERP of less than –100 indicates an activity which has a positive domestic value added but a negative equivalent value added in a free trade situation. This means that the activity does not make commercial sense in the unprotected environment. Because of this and the drastic change of values between the two periods, three industries were excluded from the 1979 ERP. They are pineapple canning (-593), coconut oil (-396) and biscuit factories (-1385). When these industries are excluded, the grouped ERP value is consistent with the other years. However, tobacco manufacture with ERP of –613 (1979) could not be excluded because it is the main item in the second end–users group in table 2.3. In 1982 its ERP took a positive value and its value is again consistent with that of other years.

Using either the NRP or ERP criteria, the values for the machinery group lie in about the middle of the range. The NRP ranking showed that the tariff structure encourages the import of capital goods — machinery was ranked third highest in 1973 but became third lowest in 1982. In terms of value, the peak of machinery's NRP (28.9 per cent, 1973) was still in the 20 to 30 per cent range which was occupied by one third of all entries.

Machinery's ERP values are higher than its NRP; 82.7 per cent in 1973, decreasing to 28.7 per cent in 1982 to become the fifth lowest. Although the low NRP succeeds in making capital easily available, the correspondingly low ERP is not high enough to encourage domestic production of capital equipment. Usually, to encourage domestic production, the government has to provide a situation in which these activities are viable and profitable. This can be achieved through high domestic prices. The high price of imported products (due to high import duty) will enable a similar domestically produced goods to be sold at the equivalent price level.

Our second perspective looks into rate differences between import substitution and export–oriented industries and between periods.

Importables' NRP is lower than that of exportables in 1973 (see table 2.4). However in 1978, the NRP for the two sectors is almost the same. ERP gave a different picture; exportables is a disadvantaged sector with an ERP lower than that of importables. In 1978, exportables even experience negative ERP.

During the import substitution period (after Independence in 1957 until mid 1970s) NRP for most groups was higher than during the export–oriented period (after mid 1970s to the present). The ERP followed the same trend as NRP; low rates reaching a peak by the mid 1970s and then declining, but with a few years lag behind NRP.

Table 2.4

Average Nominal and Effective Rates of Protection, Manufacturing Sector, Malaysia, 1973 and 1978

	Nominal		Effective	
	1973	1978	1973	1978
Importables	4.3	12.7	8.8	23.0
Exportables	9.1	12.5	6.4	–17.0
Other	35.4	21.7	48.6	55.9
Total Manufacturing	28.2	18.8	37.4	34.2

Source: Lee K.H.(1986), op cit, page 118.

Although differences exist in NRP/ERP rates of importables and exportables, there is no intended discrimination in import of capital between these two sectors. Unlike other developing countries, Malaysia has no import licensing system where companies or industries can only import if they possess a licence. Hence, in the absence of such a scheme, cost of capital cannot be made cheaper by making it available to only certain industries and not to others. Similarly import quotas or quantitative restrictions require an import licensing system to be effective. Malaysian usage of these instruments is in any case limited to a few goods and is based on political and health criteria. There is no quantitative restriction on capital by type of product or type of industry.

We will now look at tariff changes and their effect on the user's cost of capital. Data from table 2.3 is used for this purpose. User's cost of capital is calculated for the various years, followed by comparison of estimates.

The user's cost of capital is the monetary cost of securing the use of one unit of capital per period of time. This measurement derived from the marginal productivity conditions of maximising a firm's net worth[28] as developed by Jorgensen. Based on the neo-classical theory of capital accumulation, the demand for capital stock is determined with the objective of maximising a firm's net worth.

We assume that the net worth, W, is:

$$W = \int_{0}^{\infty} e^{-rt}\,[R(t) - D(t)]\,dt. \qquad (3)$$

where $R(t)$ = revenue before taxes at time t

$D(t)$ = direct taxes at time t.

r = rate of interest

The revenue function, R, is:

$$R = pQ - sL - qI \qquad (4)$$

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[28] Jorgensen, D.W., 1963. "Capital Theory and Investment Behaviour", American Economic Review, Vol. 53, No. 2.

where Q = quantity of output

L = quantity of labour services

I = total investment

p = price at output

s = wage rate

q = price of capital goods.

The function for direct taxes, D, is as follows:

$$D = u\,[pQ - sL - (v\delta q + wrq - x\dot{q})\,K] \qquad (5)$$

where u = rate of direct taxation

v = proportion of replacement chargeable against income tax purposes

w = proportion of interest chargeable against income

x = proportion of capital losses chargeable against income.

K = capital stock

δ = rate of depreciation

$\dot{q}$ = rate of change of the price of capital goods

The net worth function is then maximised subject to two constraints;

i) the firm faces a standard neoclassical production function $Q = f(K,L)$ where $f_K, f_L > 0$, $f_{KK}, f_{LL} < 0$ and $f_{LK} = f_{KL} > 0$

ii) Net investment is equal to total investment less replacement; where replacement is proportional to capital stock. This constraint takes the form:

$$\dot{K} = I - \delta K$$

The maximisation produces two marginal productivity conditions:

$$\frac{\partial Q}{\partial L} = \frac{s}{p} \tag{6}$$

$$\frac{\partial Q}{\partial K} = q \; \frac{\left[\frac{1-uv}{1-u}\,\delta + \frac{1-uw}{1-u}\,r - \frac{1-ux}{1-u}\,\frac{\dot{q}}{q} \right]}{P} \tag{7}$$

The numerator for the second condition is the after–tax user's cost of capital, because it is derived from the after–tax net worth function (equation {3})[29]. This function is the difference between the net revenue (equation {4}) and the direct taxes paid by the firm (equation {5}). The direct taxes are equal to the tax rate multiplied by taxable income (i.e gross revenue minus variable input costs and capital allowances plus capital gain). Assuming that all capital gains from changes in the price of capital goods are transitory so that $\dot{q} = 0$, then the user's cost of capital, C, becomes

$$C = q \left[\frac{1-uv}{1-u}\,\delta + \frac{1-uw}{1-u}\,r \right]$$

$$C = \frac{q}{1-u} \left[(1-uv)\,\delta + (1-uw)r \right] \tag{8}$$

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[29] For a complete derivation of equation (7) which is obtained from maximising W, the after–tax net worth function, with two constraints (neoclassical production function and rate of growth of capital stock), see Jorgenson, D. W., and Stephenson, J. A., 1967. "Investment Behaviour i#\U.S. Manufacturing, 1947 – 1960", Econometrica, Vol. 35 No. 2. The before– tax user's cost of capital is:

$$C^{*} = q(r + \delta) - \dot{q}$$

This term is obtained from maximising the before–tax net worth function,

$$W^{*} = \int_{0}^{\infty} e^{-rt} R(t)\, dt$$

with two similar constraints as in the after– tax case. Note that the before– tax net worth function differs from that of after–tax in the sense that the former (W*) is not reduced by the direct tax (D). For derivation and explanation of the before – tax user's cost of capital, see Jorgenson, D. W., 1967, "The Theory of Investment Behavior", in Ferber, R., Determinants of Investment Behavior, National Bureau of Economic Research, New York.

Coew, M., 1968, "Effects of Tax Policy in Investment in Manufacturing", American Economic Review, LVIII (May), obtained a similar function as equation (7) for the after– tax user's cost of capital by using the net revenue flow method.

From equation (8), it can be seen that changes in the rate of direct taxation (u) effect the user's cost of capital in two opposing ways. For example, if u is increased, its primary effect is to increase C. However this increase is partly offset by the indirect effect of allowing larger write-off for depreciation (d) and interest rate (r) for all "fixed" manufacturing costs.

In the next chapter, we introduce modifications to take into account the effect of tax holiday and capital allowances. To measure the effect of tariff changes, the user's cost of capital becomes:

$$C = \frac{q(1+m)}{1-u}\left[(1-uv)\,\delta + (1-uw)r \right] \qquad (9)$$

where m = tariff on capital goods.

Capital equipment is assumed to have a life of 10 years, thus δ is 0.1. The depreciation tax allowance is assumed to be a constant 10 per cent per year even though there are cases where companies are allowed accelerated depreciation (varying depreciation will be discussed in chapter 3). The corporate profit tax, u is 40 per cent. Both v and w take the value 0.1. The price of capital, q, is assumed to be constant. Tariff rates are the NRPs found in table 2.3. The interest rates of the various years, r, are as follows:

Year:	1963	1965	1970	1973	1978	1979	1982
r (%) :	4.0	5.0	8.0	9.0	7.5	7.5	10.75

Table 2.5 shows that although the NRP in 1982 was lower than the 1979 rate, the 1982 user cost is higher than in 1979. This is because of the higher interest rate in 1982.

Table 2.5

Estimates of User's Cost of Capital for Capital Equipment

Year	c = User's cost of capital	% change
1963	0.235 x q	–
1965	0.252 x q	7.2
1970	0.345 x q	36.9
1973	0.392 x q	13.6
1978	0.342 x q	– 12.8
1979	0.333 x q	– 2.6
1982	0.382 x q	14.7

2.4.2 Exchange Rate

Exchange rate movement affects not only the capital cost but also labour cost and level of employment. In line with discussions in other sections in this chapter and the next one, only the capital cost will be calculated. However, we will also include in the discussion the broader implications of exchange rate appreciation on labour cost and employment, in order to provide a comparative view. The user's cost of capital will only measure the cost of imported capital input.

As mentioned in section 2.2.4, no sectors or industries are given preferential treatment. Foreign exchange policy has never intended to make capital cheaper to certain sectors relative to others.

However, the exchange rate has varied over the years. In view of this, we incorporate these changes in the users' cost of capital. Equation (9) becomes:

$$C = \frac{f\,q\,(1 + m)\,[(1 - uv)\,\delta + (1 - uw)r\,]}{1 - u} \qquad (10)$$

where f = the real exchange rate of Malaysian Ringgit per unit of US Dollar

US Dollar is used as a surrogate of the exchange rate because it is one of the major trading partners of Malaysia and the majority of capital equipment was imported from the United States[30]. The user's cost of capital is translated into Malaysian Ringgit by multiplying equation (9) with the domestic price of capital (q x Ringgit–US exchange rates). Results of the calculation are as follows:

Table 2.6

Estimates of Users' Cost of Capital Inclusive of Foreign Exchange Effect

Year	Users' Cost of Capital	% Change
1963	0.111 x q	–
1965	0.116 x q	+ 4.0
1970	0.134 x q	+ 15.0
1973	0.194 x q	+ 44.1
1978	0.177 x q	– 8.2
1979	0.161 x q	– 9.0
1982	0.163 x q	+ 1.0

Appreciation of the Ringgit exchange rate reduces the user's cost of capital and vice versa. However, for some years, the results go against this rule because of other stronger effects, such as interest rate and tariff. Furthermore, the period covered (up to 1982) does not really capture the period of marked appreciation of the Ringgit (1983-1985).

The Ringgit exchange rate appreciation affects demand for labour in several ways:

i) The price of exportables will rise and reduced demand for exports will decrease employment.

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30 The full list of the US-Malaysia real exchange rates from 1963 to 1987 can be found in Appendix B. For calculation purposes, the reciprocals of real exchange rates were used to give the correct trend.

ii) Importables will be cheaper, the consumer price index will be less. Assuming that nominal wages still increase at the same rate as in the pre-appreciation period, real wages will rise and employment will be reduced as labour cost to producers increases (assuming a constant level of productivity).

iii) A rise in real wages will increase real income. Thus more employment will be created due to the raise in real expenditure. Appreciation will also increase the income in the non-tradeable sector which will generate more demand for non-tradeable goods. As a result, demand for labour (employment) will rise.

When all these effects are considered, it is difficult to establish the net outcome; without item (iii) – income effects – employment will definitely fall. Thus the direction of demand for labour will depend on which effect has the strongest influence.

Although it is difficult to determine the total effect of exchange rate movements on employment, there are, however, indications that show capital as a more attractive factor of production than labour. Mazumdar confirmed that the Malaysian manufacturing real wage increased dramatically during the period that the Ringgit appreciated.[31] On the other hand, capital costs have been reduced due to the changes in tariff and exchange rates and the benefits of fiscal incentives (as shown in sections 2.4 and 3.5). The fiscal incentives reduced the cost of capital very significantly.

Further discussion on the labour market in section 2.5 will analyse the reasons for upward wage movement while comparison of bias for both the factors of production is done in section 8.2.

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[31] Muzamdar, D. 1989, "Labour Markets in Structural Adjustment in Malaysia", Kuala Lumpur, Economic Planning Unit Human Resource Development Project, Mimeo.

2.4.3 Exemption From Import Duties

Exemption will further reduce the cost of capital and the amount depends on the prevailing tariff rates of the capital equipment concerned. To illustrate this we use equation (3) and table 2.5. Tariff [variable m in equation (3)] was reduced from 28.9 per cent in 1973 to 22.3 per cent by 1978. Correspondingly, the users' cost of capital (C) was reduced by 14 per cent. Thus a full exemption will result in very substantial reduction of capital cost.

Exemption is more likely to be given to export–oriented establishments (EOEs) than domestic–oriented establishments (DOEs) for the following reasons:

(i) EOEs are mainly located in special industrial areas (like FTZs and LMWs) and thus usually get automatic exemption.

(ii) EOEs' level of technology is higher than DOEs and they thus need more technically advanced equipment. This equipment is definitely not available locally. On the other hand, import substitution establishments (DOEs) mainly use lower technology and equipment, which can found locally. Therefore, export–oriented establishments and those that use high technology benefit more from this policy.

From tables 2.5 and 2.6, we can say that trade policies only marginally increase the price of capital. Capital is also easily available and there are some cases of encouragement of the use of capital (for example exemption from duties). The present trend which reduces nominal tariffs on capital will further encourage its usage. The availability and cost of capital are not differentiated between sectors, end–user groups or industries. We cannot say that import substitution industries' capital is cheaper or more available than export–oriented industries. Indeed there are indications that capital use is more attractive to EOEs than to DOEs.

2.5 Malaysian Labour Market

One factor that strongly affects the demand for labour is the wage-rental ratio. The preceding sections have studied the changes in the cost of capital, so we now should discuss the labour market, in particular the wage trend, in order to complete the picture.

Malaysian nominal earnings increased substantially from 1968 to 1987 (table 2.7). The compound nominal annual growth rate was 7.0 per cent in the period 1968-87 and 8.7 per cent for 1972-87. The difference in the two rates shows that higher wage growth occurred after 1972; and this coincides with the rapid economic growth experienced by Malaysia in that period. Real rates show fluctuations; there are two periods where real earnings decline; from 1973 to 1975 and again in 1986. During the period of wage rise, the unemployment rate also increased; in 1982 the unemployment rate was 3.34 per cent and it became 7.38 per cent in 1986.[32]

Influences on wage and unemployment can be divided into two; government policies and labour market rigidities. Government policies can again be separated into two:

(i) government wage policy
(ii) government macroeconomic responses to external and internal conditions.

There is no explicit government wage policy such as a minimum wage, but it influences the overall wage level through public sector wage increases. Since the government is the country's largest employer (employing about 800,000 people in a 4.5 million workforce in 1984) any changes in the public sector wage level will certainly be felt also in private sector wages.

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32 See Mazumdar, ibid, Appendix Table A.3.1.

Table 2.7

Nominal and Real Annual Earning of Malaysian Manufacturing Sector

	Annual Earnings ($)	
Year	Nominal	Real
1968	2049	3686
1969	2144	3870
1970	2115	3751
1971	2145	3743
1972	2132	3601
1973	2104	3218
1974	2632	3428
1975	2838	3539
1976	3127	3799
1977	3420	3967
1978	3631	4013
1979	4063	4337
1980	4526	4526
1981	5281	4814
1982	5859	5046
1983	6475	5378
1984	7095	5672
1985	7663	6106
1986	7617	6026
1987	7487	5858
Compounded annual rate of growth (%)		
1968–87	7.0	2.4
1972–87	8.7	3.3

Source: Richardson, R and Soon, L.Y.,1990. Wage Trends and Structures in Malaysia. Economic Planning Unit, unpublished report.

In 1980, government made a major salary revision, and gave large increments to most levels of employees. Gross salaries increased between 30 to 46 per cent with the larger percentage increases in the more junior categories.[33] At the senior level, government employees received increased allowances for entertainment and housing in addition to increments in basic salary of between 12 and 15 per cent. This salary revision has an impact because of its big quantum relative to the earlier ones.

Government responses to external and internal conditions indirectly influence the wage level. Macroeconomic developments initially pushed wages upward but a severe recession in 1985 caused unemployment; in some circumstances wages would have fallen but institutional wage-setting maintained the rate of wage increment and wages continued to rise.

The petroleum and commodity price boom of 1979-80 increased sharply government revenue and expenditure. The petroleum share of manufacturing exports increased from an average of 17 per cent during 1976-1978 to 24 per cent and 28 per cent in 1979 and 1983 respectively. Public expenditure as a percentage of GDP also rose from 24 per cent prior to 1979 to 37 per cent in 1983.[34] Public expenditure was increased in order to absorb the rise in oil revenue and also to reduce the effect of industrial countries' recession, due to the second oil shock, on the Malaysian economy. The creation of government-owned corporations rapidly expanded public sector employment both directly and indirectly. By 1980 the public sector had become the single largest employer in the country.

The price of oil and other primary commodities collapsed in 1985. The government undertook drastic fiscal cutbacks to correct budget deficits. These external shocks induced retrenchments and layoffs in the mining, construction

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[33] See Richardson, R. and Soon, L.Y. 1990, Wage Trends and Structures in Malaysia, Economic Planning Unit, unpublished report.

[34] Gan (1989), op. cit.

and retail sectors. Unemployment was further aggravated when the government froze public sector employment. However, these developments did not cause wages to fall; the structure of public sector pay, with fixed increments and seniority is unresponsive to market forces.

Government emphasis on turning the manufacturing sector into the largest contributor of Gross Domestic Product (GDP) is also partly responsible for the "stickiness" in the wage rates. When agriculture was the main contributor, external shocks could be absorbed and were reflected in the changing wage rates. The modern plantation sector which includes rubber and palm oil has a well developed mechanism to distribute gains and losses from commodity price swings through productivity clauses and price bonuses in wage contracts.

The manufacturing sector does not have that mechanism, in fact many wages are set in collective agreement every three years or so where workers obtain a wage increment regardless of their or the company's performance.

That observation notwithstanding, the electronics and textile industries experienced a drop in wages and in some cases retrenchments. A possible reason why this did not happen to other manufacturing industries (which continued to face upward pressures on wages), is that the two industries mainly employ female workers (and trade unions were not allowed) whereas in other industries the proportion of females is smaller. Therefore, wage competition between these two industries and others is not so strong.

In the period 1981-1985 the Ringgit became a much stronger currency. The appreciation was due to the petroleum price boom (1979) and the subsequent increase in public expenditure financing by external borrowings. External borrowings rose from about 2 per cent of GDP during the period 1976-1980 to 11 per cent in 1982.[35] The appreciation resulted in the increase of real

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[35] Gan (1981), op. cit.

wages as the nominal wages continued to rise and prices (especially of imports) declined. Also as the Ringgit appreciated Malaysian exports fell due to higher export prices. Higher prices coupled with recession in developed countries had damaging effects as shown by the reduced manufacturing exports. As a result unemployment increased.

Institutional factors in the wage-setting process make wages inflexible to market conditions. Statutory conditions of employment include: termination and layoff benefits, Employees Provident Fund (EPF), fixed overtime and bonus allowance. There are also trade unions in some industries.

The Employment Act (1955) determines minimum benefits and conditions for private sector employment. Employees are entitled to annual leave, sick leave, maternity leave, paid holidays and weekly rest days and termination and layoff benefits. Employees whose services are terminated by employers must be compensated according to the number of years worked. The benefits of terminated workers are further improved by the amendment of the 1955 Act and the introduction of Termination and Lay-off Benefits Regulations in 1980. The 1980 Regulations entitled workers to certain termination benefits if they are laid-off after 12 months of continuous service. A worker is compensated with not less than 10 days wages for every year of employment.

The Employees Provident Fund requires a mandatory contribution from both employer and employee for the latter's retirement. Presently the employer's minimum contribution is 11 per cent of monthly wage while employee's is 9 per cent. Prior to 1980, the rates were 7 and 6 per cent respectively.

There is increasing unionisation, particularly in non-manufacturing areas such as the plantation sector. Union membership increased four-fold between 1968 to 1981. However, the unionised percentage of the manufacturing labour force varies between 14 to 20 per cent during 1985-85.[36] Two regulations

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[36] Richardson and Soon (1989), op. cit.

in the Industrial Relations Act (1967) restrict the formation of trade unions in pioneer industries. This was a thorny issue for workers in the electronics industry who failed to form trade unions, and as an alternative the government encourages the formation of in-house unions. The increasing awareness of workers of their rights and bargaining power as trade unions reduces the power of employers to adjust salary downwards even in times of economic slowdown.

The method of wage setting may also have contributed to wage rigidity. In the public sector and large scale private establishments, employees receive a pre-set annual salary increment regardless of the current economic conditions. In many cases especially in the public sector, the increment is automatic. During an economic slow-down, if there is no rigidity, the salary of existing employees is expected to decrease in line with the firm's performance. However in the 1985 recession employees continued to receive their annual increment. This is in contrast with the new entrants who received lower starting salaries than those who entered the same post in the pre-recession period. This shows that wages of existing workers are sticky and cannot move downwards.

The debate about the flexibility of wages in Malaysia continues; The World Bank concluded that the Malaysian labour market is highly competitive whereas Richardson and Soon argued that it is segmented between broad sectors and occupations. However, there is evidence that wages increase even at the time of a rise in unemployment. On the other hand, capital costs have been reduced through trade policy and fiscal incentives as shown in sections 2.4 and 3.5. These relative changes in the price of capital and labour will influence the labour absorption in the manufacturing sector.

Chapter 3

FISCAL INCENTIVES

3.1. Introduction

The effect of fiscal incentives on employment creation will be studied through (i) various types of establishment and (ii) changes in the incentive system. In particular, we will ask whether fiscal incentives promote or hinder the growth of export–oriented and domestic–oriented establishments and note their effect on the relative cost of factors of production.

There are a number of studies on fiscal incentives in Malaysia such as Teh, Shepherd, Fong, Chee and Economic Planning Unit (EPU)[1]. Teh and EPU are probably the most detailed in analysing the merits or demerits of various incentives. Teh calculated the benefits of tariffs and tax holidays and the average rate of return of 25 selected establishments. The EPU study used the capital subsidy equivalent measure for comparing the various incentives. Other studies give descriptive treatments; Fong and Lim further link the incentives with several industrial growth indicators such as investment and output.

This study intends to update the previous ones. With the exception of Shepherd, other studies do not cover the changes to incentives. Thus, we begin

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1 Teh, K.P., 1977. Protection, Fiscal Incentives and Industrialization in West Malaysia since 1957, University of Malaya, monograph series.

Shepherd, G., 1980. "Policies to Promote Industrial Development", in Young et.al., Malaysia: Growth and Equity in a Multiracial Society, Baltimore, the Johns Hopkins University Press.

Fong et al., 1984. "On the Fiscal Incentive Policies for Investment: The Cases of Post-war Japan and Malaysia", Institute of Developing Economies, Tokyo, JRP Series No. 43.

Chee, P.L., 1987. An Introduction to the Malaysian Industrial Master Plan, Petaling Jaya, Pelanduk Publications.

Government of Malaysia, Economic Planning Unit 1974, Tax Incentives for Industry, unpublished report.

by looking at incentives over the period starting with Independence(1957) and ending with the Promotion of Investment Act (1986). For each of the three Acts – Pioneer Industries (1965), Investment Incentives (1968) and Promotion of Investment (1986) – we will discuss the basis and type of benefits given. This is done in section 3.3. The implications of these changes are discussed in section 3.4 where it is shown that fiscal incentives are used to promote export–oriented industrialisation.

The studies mentioned earlier only look at the general merit or demerit of each type of incentive and the benefit for individual establishments. This study will go further and check whether incentives distort the capital market and affect employment creation (section 3.5). The users' cost of capital indicates that fiscal incentives substantially reduce the cost of capital.

The chapter closes with a review of the overall effect of trade policy and fiscal incentives (section 3.6). The analysis done in sections 3.3 to 3.5 will be joined together with those of trade policy to evaluate their overall effects on industrialisation and employment. In particular, we will note whether policies encourage import substitution or export–oriented industries and which of these industries has the bigger employment creation capability.

3.2 Categories of Incentives

Fiscal incentives effect the economy at two levels:

(i) The economy–wide level where fiscal incentives are used to achieve the industrialisation objectives set by government. At this level incentives are usually seen as a package; for example to encourage foreign investment, exports or import substitution.

(ii) The establishment–level where benefits of incentives are felt, in the form of reduced income tax, exemption from import duties, tax–spared dividend and others.

Since there are many incentives offered, it may be useful to state some of their features before describing them in detail:

(i) Across–the–board versus differential incentives.

Across–the–board incentives are given equally to all industries which meet the requirement. With differential incentives, different benefits are given to different industries. The rationale for the differential incentives is that certain industries are more important or that certain industries need more help than others.

(ii) Investment–based versus earning–based incentives.

Investment–based incentives are given depending on the amount invested by establishments and thus favour establishments with a large capital base. Earning–based incentives are based on the establishments financial results. Incentives based on earnings tend to benefit only viable/profitable ventures whereas it might be argued that it is the unprofitable ones that need help.

(iii) Incentives based on "prize principle".

In this case the government sets specific objectives or requirements and benefits will only be granted if establishments fulfil those requirements. Incentives of this type cover location, labour usage, local content and export of products. The problem with this type of incentive is that it is usually too specific and as a result difficult to implement.

Types of Benefits

• Tax holidays.

During the tax holiday period, income tax and development tax[2] are not

[2] As of 1989, the income tax and development tax rates for companies are 40% and 5% respectively.

imposed on the income derived from the establishment's activities:

(i) Pioneer status takes the form of tax holiday and other benefits, and is across–the–board for all industries, although some "prize" criteria are used for an extension of the benefit period. Under the Pioneer Industries Act (1965) and Investment Incentives Act (1968), pioneer status was based on the level of investment. The basis was changed to types of product under the Promotion of Investment Act (1986).

(ii) Labour utilisation relief is a tax holiday based on employment and other "prize" criteria.

(iii) Locational incentive is a tax holiday based on location and level of investment or employment size. Additional tax holiday is based on "prize" criteria.

- Allowances and deductions.

Relief under these incentives takes the form of income tax and development tax exemption (full or partial) of adjusted income arising from the establishment's activities:

(i) Investment Tax Credit is a tax relief based on investment level and other "prize" criteria.

(ii) Investment Tax Allowance replaces the Investment Tax Credit under the 1968 Act but now the basis has changed from investment level to product type.

(iii) Reinvestment allowance is investment–based and given to establishments that are not eligible for any other form of tax incentive.

(vi) Export incentives are "prize" based; allowances and deductions are given based on exporting activities, for example, export marketing expenses can be deducted twice from taxable income.

(vii) Abatement of Adjusted Income is based on "prize" criteria of increasing exports, development of designated location and development of small–scale industries.

- Infrastructure facilities

Free Trade Zones (FTZs) and Licensed Manufacturing Warehouses (LMWs) are industrial areas or industrial site where inputs and outputs are exempted from import and excise duties. These facilities are mainly occupied by exporters.

- Depreciation

Accelerated depreciation allowances are across–the–board and investment–based. These allowances enable establishments to write off capital cost faster than provided for by the normal tax accounting procedures. Establishments that qualify are those that are not eligible for pioneer status or Investment Tax Credit but which export more than 20 per cent of their output.

- Dividend

Tax–exempt dividend is an across–the–board incentive and is part of the pioneer status incentive.

- Duties

Import duty exemption is for selected establishments, mainly based on products exported.

- Credits

Export credit refinancing (ECR) is across–the–board and gives much reduced rates for bank finance to exporting establishments, if they meet local material content and value added criteria.

3.3 Changes to Malaysian Fiscal Incentives

In general, the government's industrialisation objective has been to increase the level of investment. Thus one of the earliest and most valuable incentives encouraged infant industries or pioneer establishments. However, more specific objectives are found in the later incentives; for instance:

(i) To influence the composition of industrial development where, for example, incentives are used to promote export–oriented or heavy industries;

(ii) To achieve specific objectives such as increased employment, wider use of local raw material or greater regional dispersal of industry.

Fiscal incentives have undergone many changes since they were first introduced in 1958. These changes[3] can be looked at from three points of view:

(i) Movement away from encouragement of import substitution towards export– oriented industrialisation.

(ii) Changes in the basis on which the incentives are given.

(iii) Development of new types of incentives to reflect government industrial policy, direction or emphasis.

3.3.1 Pioneer Industries, Investment Incentives and Promotion of Investment Acts.

Table 3.1 summarizes the main features of the various Acts in the Malaysian incentive system.

[3] For detailed listing of the changes see Appendix A

Table 3.1
Malaysian Fiscal Incentives System

Incentive	Basis	Benefit
I: Pioneer Industries Act (1965)		
1) Pioneer Status	Capital investment	Tax holiday for 3–5 years
II: Investment Incentives Act (1968)		
2) Pioneer Status	Capital investment	– Tax holiday for 2–5 years – (a) Dividends are exempted from tax. – (b) Capital expenditure on existing asset incurred after tax relief period is eligible for capital allowances. – (c) Losses during the tax relief period can be carried forward.
3) Labour Utilization Relief	Employment	– Tax holiday for 2–5 years – (a), (b), (c)
4) Locational incentive	Location and either capital investment or employment	– Tax holiday for 5–8 years – (a), (b), (c)
5) Investment Tax credit	Capital investment	– Tax credit – Tax relief carried forward – Tax exempt dividend
6) Export Incentives	Export volume	– Deductions for promotion work – Accelerated depreciation allowance – Export allowance
III: Promotion of Incentives Act (1986)		
7) Pioneer Status	Promoted products/ activities	Tax holiday for 10 years
8) Investment Tax Allowance	Promoted products/ activities	Allowance up to 100% of capital expenditure
9) Abatement of adjusted income		
	i) promoted industrial area	An abatement of 5 per cent of adjusted income
	ii) compliance with the government policy on capital participation/ employment	An abatement of 5 per cent of adjusted income
10) Accelerated Depreciation Allowance	Capital investment	An initial allowance of 20 per cent and an annual allowance of 40 per cent
11) Reinvestment Allowance	Expansion and diversification	A tax allowance of 40 per cent of capital expenditure
12) Export Incentives		
(i) Export Credit refinancing scheme	Domestic content of material and value added	Refinancing help
(ii) Export Allowance	Trading activities	Allowance of 5 per cent of export value
(iii) Doubled deductions on export credit insurance premiums	Domestic insurance	Double deductions of premium in adjusted income
(iv) Double deduction for expenseson promotion of exports	Promotion activities	Double deduction in adjusted income

The 1965 Act was primarily interested in increasing investment as a means of generating economic growth. The Investment Incentive Act (IIA) introduced in 1968 began to look differently at the role of industrialisation. Its role was no longer confined to increasing the level of investment but also included other objectives such as increasing employment, encouraging the export of manufactures, and dispersing industrialisation. The coverage of IIA was much wider; benefits were given for three groups: pioneer companies, non–pioneer companies and exporters.

A major shift in the direction of incentives came with the introduction of the Promotion of Investment Act (PIA) in 1986. PIA basically has the same types of incentives as the repealed IIA but the basis on which the benefits are granted has changed. There are two main thrusts of this Act:

(i) promotion of selected products and activities
(ii) promotion of exports

For the first objective the relevant incentives are pioneer status and investment tax allowance. The second objective uses the export credit refinancing scheme, export allowance, double deduction of export credit insurance premiums and double deduction of export promotion cost.

Pioneer status is the most important and popular incentive in all the Acts. It is given to an industry or a product provided that:

i) the industry does not already exist or the product is not at present produced in Malaysia on a commercial scale, and
ii) there are good prospects for further development, and
iii) it is in the public interest to do so.

The basis for granting this incentive is the same for the 1965 Act and the IIA, namely the level of capital investment. However, for the PIA, it is changed to type of product or activity. The list of promoted products or activities touches many parts of manufacturing industry. It contains capital–intensive and labour–intensive products and activities but the relative importance of each is not easily seen.

This change of basis reflected a new thrust of industrialisation policy, away from generally increasing the level of investment, towards finding niches for certain products and activities so that Malaysia would be among the world's leading producers of those products.

A new feature of the incentive system (introduced in the PIA) allows one company to enjoy pioneer status for different products or activities. Benefits can be renewed or extended if an establishment begins to make a new product or engages in a new activity which separately qualifies for pioneer status.

Another basis, earnings, is also used in the IIA and PIA. IIA allowed losses to be carried forward, thus encouraging loss–making companies. But it also rewarded profitable companies by allowing tax exempt dividend. In the PIA, the direction is clearer; reinvestment allowance is given to companies who are expanding their activities.

The next important incentive in the IIA is the Investment Tax Credit (ITC) or its equivalent the Investment Tax Allowance (ITA) in the PIA. This incentive is given to non–pioneer companies. In IIA it was based on the level of capital investment while in PIA the basis was types of promoted product/ activity. ITA is more generous than ITC.

The 1968 Act can also be regarded as the beginning of the export–oriented industrialisation phase, as it introduces export incentives. This effort is further enhanced in the PIA which offers many incentives for exporters and traders of exported products.

The two bases for export incentives in the 1968 Act are; (i) volume of export sales, to qualify for export allowance and deduction due to marketing activities, and (ii) capital expenditure, to qualify for accelerated depreciation allowance.

Under the PIA, export incentives are granted on a more varied basis; trading and production activities, amount of credit used, marketing efforts and the combination of value added and local content.

PIA still maintain other objectives introduced in the IIA such as dispersion of industrial locations and employment. However, these incentives are not given as much emphasis as before.

The accelerated depreciation allowance, which under the IIA, was only limited to exporting companies is now extended to all companies.

3.3.2 Free Trade Zone and Licensed Manufacturing Warehouse Act

The export promotion effort received a big boost from the Free Trade Zone Act in 1971 and the Licensed Manufacturing Warehouse Act in 1975. In order to facilitate exports, establishments located in these two areas are exempt from import duties and excise tax. Such companies continue to be eligible for other incentives such as pioneer status and investment tax credit.

3.3.3 Industrial Coordination Act (1975)

In 1975, the government introduced the Industrial Coordination Act. All manufacturing establishments which exceed a minimum investment have to comply with the equity and employment requirements of the New Economic Policy[4]. Establishments are required to have at least 30 per cent of their equity

[4] See Young, K. ,Bussink, W. and Hassan, P., 1980. Malaysia: Growth and Equity in A Multiracial Society, Baltimore, The Johns Hopkins University Press for the World Bank, page.184

and employment participation from the Bumiputera (Malay) group. In 1986, the government relaxed the equity requirement, by increasing the foreign equity level from 40 to 80 per cent in certain cases. (Equity liberalisation is not strictly an incentive, but it is included here because of its relevance in promoting export–oriented activities). Export–oriented activities are allowed higher foreign equity than the domestic–oriented ones. Even within export–oriented activities, the higher the proportion of products exported, then the higher the foreign equity allowed for that establishment.

3.4 Implications of the Incentives

The effectiveness of fiscal incentives used by the Malaysian government to promote industrialisation can be observed in three ways:

(i) how they influence the mix of export–oriented and domestic–oriented industries;
(ii) how they influence factor proportions; and
(iii) whether the incentives reward efficient establishments.

Each of these is now discussed.

3.4.1 Mix of Export–oriented and Domestic–oriented Industries

Since there are many incentives offered, it is useful to see their individual and collective effects in influencing establishments' market orientation.

Although the administrative process is quite cumbersome, pioneer status is the most popular incentive because its benefits are the best. Pioneer status is free from market orientation but it was one of the factors that attracted many multinational companies to set up export–oriented activities in Malaysia (for example the electronic industry in the early 1970s). The pioneer establishments under the IIA(1968) mainly concentrated on the domestic market, to take advantage of the import substitution policy pursued at that time. Furthermore, for many of these local establishments it was their first business venture, hence they were probably unsure of venturing into the export market. Under the PIA, it is difficult to say whether pioneer status encourages exports or domestic–oriented activities because the list of promoted products/activities is so diverse. Thus, pioneer status by itself does not determine market orientation but is a major attraction to direct foreign investment which is primarily involved in exports.

There are two types of investment; the first has the clear aim of fully exporting the products arising, as in the case of foreign direct investment, and the second is investment for the domestic market. Since the first group is already meant for exports, any export incentive is an additional benefit. The question is whether export incentives are attractive enough to change the orientation of the second type from domestic to export markets.

The main drawback of the export incentives such as export allowance and abatement of adjusted income vis–a–vis the pioneer status and investment tax credits is that the former give a lower rate of tax exemption or credit than the latter. Export incentives also have fewer benefits; for example they do not allow tax exempted dividends or losses to be carried into the post–incentive period. Therefore, unless the returns from exports are worth the risk taken, export incentives alone would not make domestic investors change their market orientation.

Some export incentives originally imposed complicated qualifying conditions, for example the abatement of adjusted income for exports in PIA was based on value added and value of local content. The change to volume exported in the latter part of the same year (1986) reflects the dissatisfaction over the earlier qualifying rules .

The most attractive incentives for exporters only are the FTZ and LMW arrangements and the relaxed equity requirements. For the FTZs and LMWs, the import duties exemption for input is very useful and establishments can enjoy it concurrently with pioneer status or investment tax credit. Although FTZ and LMW incentives are very effective, the government was criticised for setting up FTZs because of their supposed minimal contribution (with the exception of employment), to the domestic economy. Likewise the liberalisation of foreign equity participation is only beneficial to foreign investors. It is not effective in encouraging more local establishments to become exporters.

Thus, of the many incentives, pioneer status and the investment tax credit incentives are the ones most widely used. In 1981, Malaysian Industrial Development Authority (MIDA) approved pioneer status for 102 establishments, investment tax credit for 94, labour utilisation for 1, location for 12, other incentives for 7. Another 397 projects were approved but received no incentives[5]. Out of these 613 approved projects, 143 (about 23 per cent) of them were export–oriented ones. Unfortunately, comparison with later years cannot be made because MIDA stopped publishing data on market orientation of approved projects.

From the above discussion, we can conclude that although efforts to encourage export–oriented establishments have been intensified, the resulting effect is not very positive, as shown by the small number of applications for export–oriented projects compared with other projects. The intensification of these efforts is shown in the increased number of export–related incentives offered by the PIA as compared to the IIA. Because of its superior benefits, pioneer status is still the most popular incentive. Therefore, unless establishments already have export–oriented activities, they would not switch activities just on the strength of export incentives alone. Benefits such as FTZ and LMW are more effective for this purpose.

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[5] MIDA, 1981 Annual Report, pages 28-31

3.4.2 Factor Proportion

There are no severe import restrictions in Malaysia, when compared with other developing countries, in particular the Latin American ones. Establishments can freely import capital and raw materials. Therefore, the analysis here is not on the effect of rationing of capital but rather on how incentives influence the cost of production and production techniques through the benefits given by capital– and employment–based incentives.

The most attractive incentives are based on level of investment. The earliest incentives directly made capital a more favoured production input than labour because tax holidays were given based on the level of investment[6]. The more capital used, the more benefits an establishment would receive; benefit increases correspondingly with the amount of capital used. The 1968 Act introduced a criterion other than level of investment, that is size of employment, the benefits continuing to be in the form of tax holiday. The government avoided giving an employment subsidy as this would entail a financial commitment. Capital users still had more incentives to choose from; pioneer status, investment tax credits, locational and accelerated depreciation allowance. For labour users there were only two; labour utilisation relief and locational.

Hence, it seem that incentives have not been used to encourage establishments to adopt or switch to labour–intensive techniques. The incentives system assists the use of capital more than that of labour. Indeed, the labour utilisation relief was not often used and was dropped in the 1986 reform of incentive system (PIA). Of the applications approved by MIDA in 1980, only two establishments obtained labour utilization relief out of the total 460 that were given approvals. By contrast, 177 establishments received pioneer status or investment tax credit.

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[6] Pioneer status and investment tax credit are the most popular incentives and are given on the basis of investment level.

The PIA list of promoted products and activities covers a wide range of items; some labour–intensive like made–up garments, some capital–intensive like computers. Thus, without investigating in detail each production process, it is difficult to see whether these incentives encourage the use of capital or labour. The export incentives under PIA also seem to be neutral because they are mainly concerned with the volume exported. However, accelerated depreciation and re–investment allowances (under PIA) clearly benefit only capital users.

Employment incentive, which was absent from the original PIA was reintroduced in the 1986 amendment but only as one of the qualifying criteria for extension of pioneer status. An establishment can also get the same benefit by fulfilling the capital requirement.

In summary, although the incentive system has moved towards a more neutral base, there are still enough capital based ones to make the use of capital more attractive than labour. Certainly the export incentives are not closely linked with the use of labour and the government does not especially promote labour–intensive export–oriented industries.

3.4.3 Efficient Establishments

Incentives can also be examined to see whether they promote efficient or inefficient industries. The majority of incentives under the IIA and PIA are based on level of investment or certain "prize" criteria. Profit performance of the establishment is not considered. Hence, incentives do not differentiate between an efficient establishment and an inefficient one. In fact, pioneer status under the Investment Incentives Act seemed to actually encourage inefficient establishments by allowing losses in the pioneer period to be carried over into the post pioneer period and also to be a source of tax exempt(tax–speared) dividends. PIA too does not emphasis efficiency because the incentives are based on products or activities that the government wishes to promote.

Two incentives are however given on the basis of efficiency. The first is the (amended) abatement of adjusted income for export. Its original complicated formula was quickly abandoned although it has since reappeared as the qualifying criterion for Export Credit Refinancing. Abatement of adjusted income is now based on the volume exported. The greater the adjusted income (profit) the greater the financial benefit and so this rewards establishments that are more successful in their exporting activities. The second incentive is the reinvestment allowance. This is given to establishments to assist expansion and diversification, in other words establishments that are doing well.

Another efficiency criterion was introduced in 1988 when the government cancelled one of the pioneer status and investment tax allowance benefits; losses incurred during the relief period cannot be carried forward and set against the post–pioneer income.

The above efficiency criteria are very few. Thus, an efficient establishment can still obtain the incentives albeit at lower amounts.

3.5 Quantifying the Effects of Incentives

It is possible to quantify the effect of changes in the incentives over the period 1968 to 1986 with reference to the cost of capital. In section 3.3, it was shown that incentives in both years were attractive to capital users. The changes from 1968 to 1986 also seem to favour this type of manufacturer over those that are labour–intensive.

The user cost of capital measurement used for this purpose was developed by Jorgensen[7] as discussed earlier in section 2.4 and later modified to suit particular situations. Here we use two of these modifications; the first one by Guisinger[8] and the second by Teh[9].

Guisinger's user cost of capital refers to tax holidays and accelerated depreciation rates while Teh's is for incentives in the form of tax allowances.

Guisinger's user cost of capital is in the form of

$$C = \frac{q\,[\,r + d_t - (u / s_1^n)\ \Sigma_{h+1}^{n}\ \{ d'_t / (1 + i)^t \}\,]}{1 - u(s_{h+1}^n / s_1^n)} \qquad (1)$$

where d_t is the economic rate of depreciation in year t

d'_t is the depreciation allowance in year t permitted by the tax law.

h is the number of years for which complete exemption from corporate taxes is granted under a tax holiday scheme.

i is the discount factor.

n is the economic life of the asset

C is the annual rental value of capital (user cost of capital)

r is the annual interest rate on the finance required to purchase the capital asset.

$s_x^y = \Sigma_{t=x}^{y} \{1 / (1+i)^t\}$

u is the corporate profit tax rate.

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7 Jorgensen, D.W., 1963. "Capital Theory and Investment Behaviour", American Economic Review, Vol. 53 No.2.

8 Guisinger, P., 1981. "Trade Policies and Employment: The Case of Pakistan", in Krueger et al (eds). Trade and Employment in Developing Countries: Individual Studies, Vol I, Chicago, University of Chicago Press for the National Bureau of Economic Research, page 58.

9 Teh(1977), op.cit., page 125.

Conditions under which equation (1) is valid are:

(a) The value of the asset is restored at the end of each year to its original cost by an investment equal to the economic depreciation incurred during the year (i.e. there is continuous replacement of older assets);

(b) the asset is financed completely by equity, whose costs to the firm are not deductible from income for tax purposes; and

(c) the corporate income tax liability is passed on in the form of a higher rental cost rather than being absorbed by the supplier of equity capital.

The equation (1) above is slightly modified from Guisinger's original. In the original equation, price of capital, q, is made up of foreign exchange price of the capital asset, (P), the exchange rate of local currency per unit of foreign exchange (f) and tariff on capital goods (m). Therefore,

$$q = P\ f\,(1 + m).$$

The effect of trade policy on price of capital has been discussed in the previous chapter. Hence, we will exclude f and m from the equation to concentrate on the effect of fiscal incentives. Furthermore, a differentiated foreign exchange rate between sectors is not significant in the open economy of Malaysia, i.e. f is constant over sectors and only varies over time. Thus for the purpose of simplicity q is assumed to be M$100.

The second measurement by Teh captures the effect of tax allowance. Thus, the user's cost of capital becomes:

$$C = \frac{q}{1-u}\,(r + d)\,(1 - uy) \qquad (2)$$

where y = capital allowance (exempt from income tax).

The user cost of capital will initially be calculated for a "neutral situation" for equation (1) and (2). Then C will be calculated for various incentives. A comparison between user cost of capital in a neutral situation and those that include incentives will be made in order to see how much the cost of capital has been reduced.

The two major incentives packages are the Investment Incentives Act (1968) and Promotion of Investment Act (1986). User cost of capital is used to analyse incentives under these two Acts. The following are the parameters;

Parameter	1968	1986
d	0.1	0.1
i	0.08	0.121
q	M$100.00	M$100.00
n	10.00	10.00
r	0.08	0.121
u	0.4	0.4

Data for n and therefore d was estimated by Nagaraj[10] for the Malaysian case. The values of r were those prevailing in the relevant period[11]. i is assumed to take the values of r.

Tables 3.2 and 3.3 show the effect of incentives on the cost of capital in 1968. The incentives were (i) accelerated depreciation rate that allowed companies to amortize capital assets at 20 per cent per annum, (ii) tax holiday for a period of 6 years granted under pioneer status (this period could be extended by two years under certain conditions), and (iii) investment tax credit in the form of an allowance given against taxable income. In 1968 the allowance was 25 per cent of capital expenditure. It was later increased by another 5 per cent and in 1971 the rate became 40 per cent.

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[10] Nagaraj, S., The Determinants of Investment Behaviour in West Malaysia, M.Ec. thesis submitted to the Faculty of Economics and Administration, University of Malaya, unpublished.

[11] Bank Negara Annual Reports.

Table 3.2

Annual Rental Value of a M$100 Machine under Various Incentives Policies in 1968

	Policy	User cost of capital M$ per annum	Reduction in user cost of capital (%) from neutral policy
(1)	Neutral Policy $r = 0.08$ $d=d' = 0.1$ $u = 0.4$	23.33	–
(2)	Accelerated Deprecia–tion $d = 0.2$	22.06	6
(3)	Tax holiday for the period of 6 years $h = 6$	19.90	15
(4)	Tax holiday for the period of 8 years $h = 8$	18.48	21
(5)	Tax holiday $h = 6$ and accelerated depreciation $d=0.2$	17.71	24

Table 3.3

Annual Rental Value of a M$100 Machine Under Incentives in the Form of Tax Allowance; 1968

	Policy	User cost of capital M$ per annum	Reduction from neutral policy (%)
(1)	Neutral Policy $r = 0.08$, $d = 0.1$, $u = 0.4$	30	–
(2)	Investment tax credit of 25% $y = 0.25$	27	11
(3)	Additional credit of 5% $y = 0.3$	26.4	13
(4)	Increased capital allowance, $y = 0.4$	25.2	16

Some establishments can enjoy both pioneer status and accelerated depreciation rate simultaneously for different parts of their operations. For example pioneer status is given for a new investment while accelerated depreciation is for expansion of existing plant. Establishments that have accumulated tax credits can carry them over to the post pioneer period.

Pioneer status, as expected, is shown to be a better incentive than accelerated depreciation in terms of reduction the cost of capital. A six-year tax holiday reduces user cost of capital in a neutral situation by 15 per cent while accelerated depreciation reduces the cost by only 6 per cent. Investment tax credit also does not match a tax holiday, as it reduces user cost of capital by only 11 per cent (if the allowance is 25 per cent). Only if the allowance is large (for example 40 per cent) does the benefit match pioneer status.

In structure, the incentives available in 1986 differ little from those in 1968, except that they are given at a greater rate. A tax holiday can be enjoyed for a period of up to ten years for a particular product or activity. But the same establishment can then qualify for another pioneer status based on another product or activity. Tables 3.4 and 3.5 give the effect of incentives in 1986. The user cost of capital under a neutral policy has increased, due to the increase in interest rates. The biggest reduction (46 per cent) is recorded by ten year pioneer period incentives. Investment tax allowance of 100 per cent is almost equivalent to pioneer status, showing 40 per cent capital cost reduction. The 1986 order of incentives attractiveness does not differ from that of 1968; most attractive is pioneer status followed by investment tax allowance and then accelerated depreciation. For an establishment that does not qualify for the five year tax holiday, investment tax allowance of 100 per cent gives almost the same benefit. Therefore, although most establishments seek pioneer status and this is also the most widely enjoyed incentive, establishments do not lose much in benefit if granted investment tax allowance instead.

Table 3.4		
Annual Rental Value of a M$100 Machine under Various Incentives Policies in 1986		
Policy	User cost of capital M$ per annum	Reduction in user cost of capital (%) from neutral policy
(1) Neutral Policy $r = 0.121, d = d' = 0.1$ $u = 0.4$	30.17	–
(2) Accelerated Depreciation $d = 0.2$ $d_1' = 0.4, d_2' = 0.4$ $d_3' = 0.2$	27.59	8
(3) Tax holiday for period of 5 years, $h = 5$	24.14	20
(4) Tax holiday for the period of 10 years $h = 10$	16.14	46
(5) Tax holiday $h = 5$ and accelerated depreciation $d=0.2$	19.92	34

Table 3.5		
Annual Rental Value of a M$100 Machine under Incentives in the Form of Tax Allowance; 1986		
Policy	User Cost of capital M$ per annum	Reduction from neutral policy (%)
(1) Neutral Policy $r = 0.121$ $d = 0.1,\ u = 0.4$	36.80	–
(2) Investment tax allowance of 100% $y = 1.0$	22.10	40
(3) Reinvestment allowance of 25% $y = 0.25$	33.12	10
(4) Increased reinvestment allowance of 40% $y = 0.4$	30.90	16

Reduction percentages shown in tables 3.2 to 3.5 in some ways can be used as an indicator of which incentive to chose if an establishment qualifies for more than one. But for an establishment that can only qualify for one particular incentive there is of course no choice.

In summary, user cost of capital or the annual rental value of capital is substantially reduced by the various incentives offered.[12]

3.6 Comparison of Fiscal Incentives and Trade Policy

The analysis in this section will begin by comparing the effect of fiscal incentives and trade policy on the cost of capital; whether they act in the same way or in opposing ways. We will also look into the influence of both policies in promoting import substitution and export-oriented industrialisation.

3.6.1 Effect of Policies on Cost of Capital

First, we compare how the two policies (fiscal and trade) are administered. Fiscal incentives are mostly administered piecemeal although there have recently been efforts to consolidate them (for example Promotion of Investment Act 1986). The various incentives have different qualifying criteria, making the application and award process complicated. Applicants also have to consider carefully which one to apply for as some incentives are mutually exclusive. Among the trade policy instruments, only tariffs are based on case by case criteria. Although import restrictions are based on the same criteria as tariffs, their incidence is too low to be considered important. Exchange rates

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[12] In their survey of subsidy to capital in Malaysia, Lim and Anuwar arrived at the same conclusion as this study, i.e investment incentives reduce the cost of capital. They further proved that the provision of capital subsidies did encourage greater capital intensity in Malaysian manufacturing in 1979.

See, Lim, D. and Anuwar, A., 1989. Malaysian Human Resources Development Plan Project, Module III, Study No. 6 on Manufacturing, unpublished report.

are applied equally to the whole economy. Thus, trade policy seems to be less complicated than fiscal incentives.

The second comparison looks at the most important instruments of both policies. The most widely used and most beneficial fiscal incentive is pioneer industry status which gives tax exemption of otherwise taxable income. This will benefit capital more than labour users as cost of labour is already deducted in arriving at taxable income. Without pioneer status only interest on capital can be deducted when calculating the adjusted income. However, under this incentive a tax holiday is given based on the level of capital invested. Tariff is the most widely used instrument to execute trade policy. Its effect is however the opposite of pioneer status; it increases the cost of capital. From the early 1980s exchange rates have become a prominent instrument.

Tables 3.6, 3.7 and 3.8 are restatements of tables in chapter 2 and the present chapter for the purpose of comparing how fiscal incentives and trade policy affect the cost of capital.

Most fiscal incentives have the effect of reducing the cost of capital (table 3.6). For example a six year tax holiday in 1968 reduces capital cost by 14.7 per cent and if the exemption period is longer then the benefit is larger (20.8 per cent for eight year exemption). The latest package introduced in 1986 (the Promotion of Investment Act) is even more generous to capital users.

The effects of trade policy are not as clear cut as those of fiscal incentives. Tariff produced increases in users' cost of capital (C) from 1963 to 1970 but this cost fell in 1978 and 1979. The effect of exchange rates in C is to amplify these changes (compare tables 2.5 and 2.6). But when the exchange rate was over–valued it nullified the increase in C due to tariff, as shown by figures for 1973. NRP and ERP provide another perspective on the cost of capital. The decreasing trend of NRP implies an overall cost reduction. However the ERP is of more interest; it shows that the capital machinery industry is not over protected.

Table 3.6

Reduction in Cost of Capital Due to Fiscal Incentives

Type of policy	Percentage of reduction 1968	1986
1) Accelerated Depreciation Allowance	5.5	8.5
2) 5 year tax holiday	–	20.0
3) 6 year tax holiday	14.7	–
4) 8 year tax holiday	20.8	–
5) 10 year tax holiday	–	46.5
6) Investment Tax Credit (25%)	11.0	10.0
7) Investment Tax Allowance (100%)	–	40.0
8) Increased Capital Allowance	16.0	16.0

Table 3.7

Change in Cost of Capital Due to Trade Policy

Years	Percentage change from the previous period: Tariff only	Tariff and exchange rate
1963–1965	+ 7.2	+ 4.0
1970	+ 36.9	+ 15.0
1973	+ 13.6	+ 44.1
1978	– 12.8	– 8.2
1979	– 2.6	– 9.0
1982	+ 14.7	+ 1.0

Table 3.8

NRP and ERP for Capital Equipment for 1963–82 (%)

Year :	1963	1965	1970	1973	1978	1979	1982
NRP	5	5	20	28.9	22.3	18.8	15.1
ERP	6	6	64	82.7	38.6	33.9	28.7

Therefore the prices of imported and domestic capital goods need not be kept high to ensure the survival of that industry.

Thus, the effect of trade policy is slightly at variance with fiscal incentives. Fiscal incentives substantially reduce the cost of capital while trade policy increases it marginally. However, it must also be said that trade policy, in certain cases, allows exemptions from import duty which reduce the cost of capital.

3.6.2 Effects of Policies on Import Substitution and Export–oriented Industries

Fiscal incentives and trade policy have been used in many countries as tools to promote import substitution (ISI) and/or export–oriented industrialization (EOI). This subsection will investigate:

- which policy promotes which type of industrialisation,
- the degree in which these policies are carried out,
- whether one contradicts the other.

For the first task, the fiscal incentives can be divided into two groups. The first group comprises incentives that are neutral to both strategies – pioneer status, tax credit allowance and accelerated depreciation allowance. This group is by and large the most important and heavily subscribed. The second group consists of incentive of export promotion.

Studies have shown that the industries established between 1957 and the early 1970s were mostly of the ISI type[13]. Pioneer status, per se, is neutral to ISI and EOI. Beside helping to establish domestic industries it also attracts foreign investment with an export market orientation. Subsequent changes

[13] Hoffmann. L. and Tan, S.E., 1980. Industrial Growth, Employment, and Foreign investment in Peninsular Malaysia, Kuala Lumpur, Oxford University Press, page 151.

to the incentives system introduced many incentives to exporters. Therefore, fiscal incentives could be regarded as instruments that promote EOI.

Trade policy, namely tariff, was used initially to protect local industry, as shown in the relatively high values of ERP. In the latter part of the 1970s, tariffs were slowly lowered. Exchange rate has only been used as a trade instrument since the early 1980s, and the Ringgit is undervalued in order to boost exports. We conclude that trade policy initially aimed to help ISI but recently has shifted in favour of EOI.

The second point of comparison is the degree to which these policies are implemented. An extremely protective policy to promote domestic industries can be harmful to export promotion effort. Very high tariffs will move resources away from export–oriented industries to import substitution ones. Import substitution policies may be considered extreme when domestic industries are so protected that their growth rate exceeds that of domestic demand. Export–oriented industries should not be encouraged to the point that the domestic marginal rate of transformation exceeds the international one.

One indicator of the degree of implementation of ISI policy is the level of ERP. From figure 2.1, the highest average ERP is 46.0 (1982). In the same year, the mode of ERP distribution falls to the 30–40 range. These figures are very much lower than some other developing countries; Pakistan on average, has ERP of 200[14]. Other indicators such as the absence of an import licensing scheme and minimal quota control, reinforce the earlier observation that ISI is not implemented to an extreme degree. These two instruments are most often used if a country wants to highly protect a particular industry. An exception must be made for heavy industries where very high ERP (production of cars)

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[14] See Krueger, A., 1983. Trade and Employment in Developing Countries: Synthesis and Conclusions, Vol. 3, Chicago, The University of Chicago Press for National Bureau of Economics Research, page 34.

or total restriction (production of steel bars) was implemented.

Domestic resource cost (DRC) could be a measure of how far the EOI policy is pursued. DRC represents a social valuation of domestic resources used per unit of foreign exchange saved. If DRC exceeds one, it shows that EOI policy has reached a point where it is actually not beneficial to the country. The study by EPU[15] estimated that the DRC of 16 out of 46 Malaysian industries exceeded the value 1.0. With three exceptions these 16 industries are based primarily on imported inputs and/or are highly protected. Again import licenses and quotas could be used as in South Korea, to provide relatively cheap capital and inputs. In Malaysia, these practices are only limited to establishments in FTZs.

The evidence shows that neither fiscal incentives nor trade policy was pursued to an unjustifiable extent. In general we can conclude that the present policy is more inclined to EOI, but ISI is also pursued in selected industries (for example heavy industry).

A third check is now made on whether one policy nullifies the other. An ISI instrument, tariff, raises the cost of inputs, and this may jeopardize EOI efforts. On the other hand, generous export incentives may direct resources away from ISI. Even though nominal tariffs have been decreasing, the ERP continues to rise. Assuming constant returns to scale production process and the increasing ERPs are for inputs, this will definitely hurt exporting establishments. The EOI instrument that overcomes this problem is FTZ and LMW. Their almost automatic tariff exemption on inputs protects establishments in these types of location from tariff changes. However it is limited to a small number of areas and establishments. Other export incentives, such as abatement of adjusted income and promotional allowances are only successful to a limited extent in diverting resources from ISI to EOI. Furthermore, a major part of investment in the export-oriented sector is foreign

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15 Economic Planning Unit(1984), op cit, page 142.

capital which was never intended for ISI.

Therefore, tariff imposes a burden on EOI. This is further supported by Gan who showed that 60 to 70 per cent of the tariff intended to protect domestic production is ultimately borne by exporters[16].

A few key points emerge from the above discussion. Firstly, fiscal incentives are mainly used to promote EOI, while ISI is helped by trade policy. Secondly, neither policy has been implemented so strongly as to create severe distortions. Thirdly, trade policy instruments have some adverse effects on EOI.

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[16] Gan(1989), op.cit. He uses Clements and Sjaastad model to analyse the general equilibrium effects of tariff protection and export promotion policies on the relative incentives for production of importables and exportables.

Chapter 4

REVIEW ON ELASTICITY OF SUBSTITUTION

4.1 Introduction

The theoretical development of elasticity of substitution between labour and capital benefited greatly from the introduction of the Constant Elasticity of Substitution (CES) function, in which the elasticity is constant but not necessarily equal to 1.0. There are now also ways in which to overcome the constraints of the CES function. Substitution of more than two factor inputs is now possible by means of the Transcendental production function or better known as Translog Production function.

This chapter first looks at the production functions which could be used to calculate the elasticity of substitution (section 4.2). The choice of functions depends greatly on data requirements. In the case of Malaysia, the non–availability of certain data, such as the breakdown on types of workers, may be the decisive factor.

This study finds that two functions – CES and Translog – are the most appropriate ones for estimating the Malaysian elasticity of substitution. The calculations are made in chapter 5.

The review of empirical studies first looks at those done for Developed Countries (section 4.3.1) followed by Less Developed Countries (section 4.3.2). The studies are grouped into two; cross–sectional and time–series.

Section 4.4 reviewed the studies on Malaysian elasticity of substitution. Cross–sectional studies are discussed as well as a time–series one.

The last part of the chapter (section 4.5) compare the various estimates; Developed, Less Developed (LDCs) and Malaysia. Developed countries elasticities are higher than LDCs. Malaysian estimates conform with those of LDCs but showed a declining trend.

The review of empirical studies will also be useful in interpreting the results in chapter 5.

4.1.1 Definition of the Elasticity of Substitution

Assuming that Y = (K,L) is a production function with two factor inputs (K is capital and L is labour), then the elasticity of substitution between the two inputs is a measure of the relative ease with which these factors may be substituted in production.

One of the earliest definitions of elasticity of substitution was introduced by Allen[1] as follows:

Let $f_K = \frac{Y}{K}$ and $f_L = \frac{Y}{L}$ be the marginal products of capital and labour respectively, then the marginal rate of substitution of factor L for factor K is r where:

$$r = \frac{f_K}{f_L}$$

The marginal rate of substitution represents the additional amount of labour necessary to maintain the amount produced when a small unit of capital is reduced. The rate of change of r is defined as the elasticity of substitution.

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1 Allen, R.G.D., 1938. Mathematical Analysis for Economists. London, Macmillan.

Thus, the elasticity of substitution between labour and capital is[2]

$$\sigma = \frac{\frac{K}{L} \; d\left(\frac{L}{K}\right)}{\frac{1}{r} \; dr}$$

where $d\left(\frac{L}{K}\right)$ is the increase or decrease in the use of labour as compared with that of capital. $dr = d\left(\frac{f_K}{f_L}\right)$

If a production function has more than two factor inputs, the elasticities of substitution among these inputs are known as partial elasticities of substitution[3]. In this case, when an input price increases the substitution effect can indicate whether the substituting input is competing with or complementary to the one that experienced the price increase.

4.1.2 Application of Elasticity of Substitution

The elasticity of substitution between capital and labour is an important part of the structure of production in an economy or an economic unit. The concept is found in many areas of economic thought, inter alia.:

(i) In the Harrod–Domar growth model, the stability of growth paths depends on the assumption of elasticity of substitution. Growth paths can vary depending on the elasticity of substitution in models like Swan's[4].

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2 Allen, ibid., page 341.

3 Allen, ibid., page 504.

4 For explanation see, Pitchford, J. D.,1960. "Growth and the Elasticity of Factor Substitution", Economic Record, December, pages 491-516.

(ii) The effects of varying factor endowments on international trade depend on the shape of particular production functions. Zero or unitary elasticities of substitution in all sectors of the economy lead to Samuelson's strong assumption as to the invariability of the ranking of factor proportions. Variations in elasticity among sectors imply reversals of factor intensities at different factor prices with quite different consequences for trade and factor returns.

(iii) The level of unemployment can be influenced by the elasticity of substitution. In an economy where there is high growth of the labour force, a low elasticity of substitution and scarcity of capital can cause high unemployment.

(iv) Determining the relative factor income shares between labour and non–labour factors of production, and the relative growth of these factors.

(v) Elasticity of substitution can reflect the degree of responsiveness of a national economy to changes in the pattern of international trade. The domestic economy can exploit its dynamic comparative advantage by increasing the use of the factor of production which has comparative advantage. The greater the elasticity of substitution, the better is the economic response.

(vi) When the elasticity of substitution is greater than one it is possible to maintain high output growth by substituting a slower growing factor of production with a faster growing one.

4.2 Theoretical Literature Review

Specification and estimation of the production function has always been a major research topic for economists, because many economic theories and forecasts are based on it. Studies have developed along two lines. One looks at the relationship between a subset of factor inputs and the output. The other look at the relationship between the whole economy and the interdependence of various sectors in it. The latter approach is based on the Walras General Equilibrium model. This review only considers the former approach, also known as Marshallian, and traces the development of three main production functions, in particular with regard to estimating the elasticity of substitution. The production functions are:

(i) The Cobb– Douglas function
(ii) The Constant Elasticity of Substitution function
(iii) The Transcendental Logarithmic Production function

4.2.1. The Cobb–Douglas Function

One of the earliest to be developed, and the most widely used production function, the Cobb–Douglas function takes the form of:

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

where
Y = Output
A = Technological parameter
K = Fixed Capital
L = Labour
α, β = Distributive parameters

This function was derived from the empirical observation that the total wage was a constant proportion of total output. In perfectly competitive markets with profit–maximizing entrepreneurs, wages equal the marginal product of labour. The Cobb–Douglas function assumes that the elasticity of substitution is fixed and equal to one. This means perfect "substitutability". Another assumption is the presence of constant return to scale.

The parameters α and β can be regarded as the returns to labour and capital respectively. From various estimates, it has been found that ($\alpha + \beta$) always equals one, with the value of α about 0.65 and β about 0.35[5].

The parameter A represents technical progress and this function is of the Hicks–neutral kind. Increases in technological level do not change proportions of factors used.

4.2.2 The Constant Elasticity of Substitution Function

Empirical investigations showed that the Cobb–Douglas assumption – elasticity of substitution between capital and labour is unity – does not always hold. Based on empirical observations that the value added per unit of labour used within a given industry varies across countries with the wage rate, Arrow, Chenery, Minhas and Solow[6] (ACMS) proposed a constant elasticity of substitution function (CES). This function has the form:

$$V = \gamma \, [\, \delta K^{-\rho} + (1- \delta)\, L^{-\rho} \,]^{-1/\rho} \qquad (2)$$

where
V = Value added
δ = Distribution parameter
γ = Efficiency parameter
K = Fixed Capital
L = Labour
ρ = Substitution parameter

5 Heathfield, D.F., 1971. Production Function, Macmillan Studies in Economics, London, Macmillan Press, page 34.

6 Arrow, K.J., Chenery, H.B., Minhas B.S. and Solow R.M., 1963. "Capital-Labour Substitution and Economic Efficiency", The Review of Economics and Statistics, Vol. XLIII, No. 3, pages 225-250.

Two assumptions are needed to derive the function above:

(i) constant returns to scale

(ii) profit–maximising entrepreneurs facing perfectly competitive markets

The main attraction of this function is its constant elasticity of substitution (but not necessarily one as in the case of the Cobb–Douglas function). This elasticity, denoted by the symbol σ, is determined uniquely by ρ where $\sigma = \frac{1}{1+\rho}$

The admissible values of ρ run from -1 to ∞, which permits σ to range from $+\infty$ to 0. More detail on the various values of ρ and the corresponding σ value are as follows:

If $\rho = -1$,	this implies infinite σ
$-1 < \rho < 0$,	σ is greater than unity
$\rho = 0$,	this implies the Cobb–Douglas elasticity of substitution, which is unity
$0 < \rho < \infty$,	σ is less than unity
as $\rho \to \infty$,	$\sigma \to 0$

These values of ρ , when placed into the production function equation, show the influence of capital–labour ratios on the behaviour of output per unit of capital.[7]

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7 In Arrow, Chenery, Minhas and Solow, ibid., page 230.
Another form of the production function is $y = \gamma [\delta x^{-\rho} + (1 - \delta)]^{-1/\rho}$
where y = Output per unit of labour
x = Capital labour ratio

Technological progress can be introduced into this function in two ways. The first way is through the efficiency parameter γ, resulting in Hicks–neutral technical progress, namely not labour or capital augmenting. The second way is through changes in the distributive parameter δ, which may result in labour augmenting or capital augmenting technological progress[8]. Since equation (2) cannot be directly estimated, an indirect method using the marginal productivity condition for labour is used. With this method, the elasticity of substitution can be estimated by the equation:

$$\log \frac{V}{L} = \log a + b \log w \qquad (3)$$

where b is the estimate for elasticity of substitution
w is the wage rate.

4.2.2.1. Variable Elasticity of Substitution

Lu and Fletcher[9] looked at the constant value of elasticity of substitution aspect of the CES function. They thought that when the capital–labour ratio varies due to changes in the factor price ratio, the elasticity of substitution may also vary. Finding the initial empirical relationship used by ACMS[10] to be weak, Lu and Fletcher suggested as a better basis for a production function, a three–variable relationship between output per unit of worker, wages and the capital–labour ratio.

$$V = \gamma\,[\delta k^{-\rho} + (1-\delta)\,\eta\,(\frac{K}{L})^{-c\,(1+\rho)}\,L^{-\rho}]^{-1/\rho} \qquad (4)$$

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[8] For the mathematical explanation see Heathfield (1971), op.cit., page 65.

[9] Lu, Y. and Fletcher, L.B., 1968. "A Generalisation of the CES Production Function", Review of Economics and Statistics, Vol. 50.

[10] Empirical relationship by ACMS uses only two variables, output per unit of labour and wages.

The proposed production function is known as the Variable Elasticity of Substitution function (VES). This function reduces to the CES if c equals zero[11]. VES has the properties of:

(i) positive marginal products.

(ii) downward sloping marginal product curves over relevant ranges of inputs.

(iii) constant return to scale.

(iv) variable elasticities of substitution.

The elasticity of substitution is:

$$\sigma = \frac{b}{1 - c\,(1 + \frac{R}{X})} \qquad (5)$$

where $X = \frac{K}{L}$

$$R = \frac{-\,dK}{dL}$$

Therefore, the elasticity of substitution is not constant but varies with the capital–labour ratio.

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[11] The function (4) is obtained from:

$\log Y = \log a + b \log [Y - X\,(dy/dx) + c \log X]$

Solving for dy/dx and employing the substitution

$Z = Y^{1-1/b}$, we obtain

$V = [\beta k^{-\rho} + a\eta \ \ (K/L)^{-c(1+\rho)} L^{-\rho}]$

h is defined as = $\frac{1 - b}{1 - b - c}$

If c = 0, h=l and by defining $\alpha = (1 - \delta)\,\gamma^{\rho}$ and $\beta = \delta\gamma^{\rho}$, the VES function will become CES function.

The VES function has the same limitations as the CES function, namely, it is difficult to include more than two variables, and it is non-linear in parameters.

4.2.3 Transcendental Logarithmic Production Function

The Cobb-Douglas and CES production functions imply the aggregation of inputs into capital and labour. Such aggregation needs stringent separability among inputs. Later research has concentrated on deriving a production function with disaggregated factor inputs.

Christensen, Jorgenson and Lau[12] proposed the Transcendental Logarithmic Production Function (referred to as Translog function) which allows any number of inputs. Separability can be imposed on the Translog form by testable parametric restrictions. This function can be written as:

$$\ln Y = \ln \alpha_0 + \alpha_A \ln A + \sum_{i=1}^{n} \alpha_i \ln X_i + \frac{1}{2} \gamma_{AA} (\ln A)^2$$

$$+ \frac{1}{2} \sum_{i=1}^{n} \sum_{i=j}^{n} \gamma_{ij} \ln X_i \ln X_j + \sum_{i=1}^{n} \gamma_{iA} \ln X_i \ln A \qquad (6)$$

where
- Y is output
- X_i are inputs
- A is a technology index
- $\gamma_{ij} = \gamma_{ji}$

[12] Christensen, L.R., D.W. Jorgenson and L.J. Lau, 1971. "Conjugate Duality and the Transcendental Logarithmic Production Function", (abstract) Econometrica, 39, 4, July, pages 255-256.

This function combines both linear and quadratic terms. If the function is characterised by constant returns to scale and Hicks–neutral technical change properties, then the parameters are subject to these restrictions:

(i) $\Sigma_i \; \alpha_i = 1, \qquad \Sigma_i \; \gamma_{ij} = 0, \qquad \Sigma_j \; \gamma_{ij} = 0$

$\Sigma_i \, \Sigma_j \; \gamma_{ij} = 0, \qquad \Sigma_i \, \gamma_{iA} = 0$

(ii) $\alpha_A = 1, \qquad \gamma_{AA} = 0, \qquad \gamma_{iA} = 0$

Thus the function becomes:

$$\ln Y = \ln A + \ln \; \alpha_0 + \Sigma_i \, \alpha_i \ln X_i + \frac{1}{2} \; \Sigma_i \, \Sigma_j \gamma_{ij} \ln X_i \ln X_j \qquad (7)$$

An interesting feature of this model is that it allows both the testing of a consistent aggregation of inputs and the separability of inputs. The concepts of aggregation and separability were highlighted by Solow[13] and Green[14]. Berndt and Christensen[15] formalised these concepts by introducing conditions for testing them.

Aggregation is consistent when the analysis of the problem remains unchanged even if using more detailed information than was contained in the aggregation.

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13 Solow, R.M.,1955-1956. "Production Function and the Theory of Capital", Review of Economic Studies , Vol. 23, pages 101-108.

14 Green, H.A.J., 1964. Aggregation in Economic Analysis, Princeton, Princeton University Press.

15 Berndt, E.R. and Christensen, L.R.,.1973a. "The Internal Structure and Functional Relationships: Separability, Substitution and Aggregation", Review of Economic Studies, Vol. 40, pages 403-410.

Properties of the Translog Function

The Translog function does not satisfy the two conditions that: (i) output increases monotonically with all inputs and (ii) its isoquants are convex globally[16]. Both these conditions have to be tested.

The Translog function also does not assume separability between various inputs. This characteristic has also to be tested. Briefly, inputs i and j are globally separable from k when:

$$\alpha_i \gamma_{jk} - \alpha_j \gamma_{ik} = 0$$

$$\alpha_{im} \gamma_{jk} - \alpha_{jm} \gamma_{ik} = 0 \quad m = 1, \ldots\ldots\ldots\ldots, n$$

This property can be used to check if the conditions for a consistent aggregation of the different pairs of inputs are met[17].

A general Translog function is not a homothetic function, hence the level of production affects the technological characteristics. The combination of non–homotheticity, non–a priori assumptions of monotonicity and convexity conditions, implies that the elasticities of output with respect to factor inputs and elasticities of substitution between factors are not necessarily constant and may vary along each isoquant. These elasticities also depend on the production level. Finally, the Cobb–Douglas is a special case of the Translog function.

The Translog function is also helpful in examining the complementarity or substitutability between different pairs of inputs; for example between physical capital and skilled labour. Shortage of skilled labour can retard the growth of an industry. This can be overcome if skilled labour can be substituted by physical capital.

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16 For detailed discussion, see Berndt, E.R. and Christensen, L.R., 1973b. "The Translog Function and the Substitution of Equipment, Structures and Labour in U.S. Manufacturing 1929 - 68", Journal of Econometrics , 1.

17 See Berndt and Christensen, ibid., pages 84-86.

Berndt and Christensen[18] also showed that a consistent aggregate of different productive inputs exists if and only if some elasticities of substitution between pairs of factors are equal. The variables X_1 and X_2 are functionally separable from a third variable Z if and only if :

$$F(X_1, X_2, Z) = G(H[X_1, X_2], Z) \tag{8}$$

This is equivalent to certain equality restrictions on the Allen Partial Elasticities of Substitution (AES)[19], which states that the elasticity of substitution between X_1 and Z should be equal to that of X_2 and Z. If this holds, then X_1 and X_2 can be aggregated. Thus the problem of testing for aggregation can be turned into a method of determining the elasticities of substitution between factors. It can be seen that the elasticity of substitution is variable at any point along the isoquant.

The estimation procedure uses profit–maximising conditions in competitive product and factor markets. These conditions imply a system of semi–logarithmic equations with one equation for each input. Each of these equations gives the cost share of the input concerned as a linear function of the log of each of the inputs.

Substitution among factor inputs is measured by the Allen Partial Elasticity of Substitution (AES). Berndt and Christensen[20] showed that for the Translog function these elasticities are equal to:

$$\sigma_{ij} = \frac{|Gij|}{|G|}$$

where $|G|$ is the determinant of

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[18] Berndt and Christensen, ibid.

[19] Allen (1938), op cit.

[20] Berndt and Christensen(1973b), op.cit. , page 97.

$$G = \begin{pmatrix} 0 & M_1 & M_2 & M_3 \\ M_1 & \gamma_{11} + M_1^2 - M_1 & \gamma_{12} + M_1M_2 & \gamma_{13} + M_1M_3 \\ M_2 & \gamma_{21} + M_2M_1 & \gamma_{22} + M_2^2 - M_2 & \gamma_{23} + M_2M_3 \\ M_3 & \gamma_{31} + M_3M_1 & \gamma_{32} + M_3M_2 & \gamma_{33} + M_3^2 - M_3 \end{pmatrix}$$

and $| G_{ij} |$ is the co–factor Gij in G.

The Translog production function has been used to explore the substitution possibilities across several factor inputs. Examples of these studies are: substitution among labour, skill and capital (Corbo and Meller[21]); equipment, structures and labour (Berndt and Christensen[22]); energy, capital and labour (Halvorsen and Ford[23]); reproducible capital, labour and nonfuel mineral resources (Moroney and Trapani[24]) and capital, labour and natural resource products (Humphrey and Moroney[25]).

The last three studies mentioned above used the Translog cost function as an alternative method of estimating the factor substitution, and this cost function was developed, based on the idea that production of output by economic units follows a cost function[26].

$$C = c\,(Q, P_i) \qquad i = 1, \ldots\ldots\ldots\ldots\ldots, n \qquad (9)$$

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21 Corbo, V. and Meller, P., 1982. "The Substitution of Labour, Skill and Capital: Its Implication for Trade and Employment", in Krueger, A.O., (ed), Trade and Employment in Developing Countries: Synthesis and Conclusions, Vol. 3, Chicago, The University of Chicago Press for the National Bureau of Economic Research.

22 Berndt and Christensen (1973b), op.cit.

23 Halvorsen, R. and Ford, J., 1979. "Substitution Among Energy, Capital and Labour Inputs in U.S. Manufacturing", Advances in the Economics of Energy and Resources, Vol. 1, pages 51-75.

24 Moroney, J.R. and Trapani, J.M., 1981. "Factor Demand and Substitution in Mineral-intensive Industries", Bell Journal of Economics, Vol. 12, No. 1, Spring.

25 Humphrey, D.B., and Moroney, J. R., 1975. "Substitution among Capital, Labour and Natural Resource Products in American Manufacturing", Journal of Political Economy, Vol. 83, November.

26 See Humphrey and Moroney, ibid, pages 73-78.

where C is total cost

Q is output

P_i is the price of the ith input.

By imposing conditions on behaviour of the cost function when Q changes, its homogeneity , concavity and C are differentiable with respect to P_i and minimised for all $Q > 0$. When inputs face competitive markets, there are dual solutions for the cost function (9).. Note however that this production function need not necessarily be the Translog production function (6).

A Translog form of the cost function is chosen rather than that of profit maximising form because:

(i) Direct estimation methods can be used to calculate the elasticities of substitution, that is, side conditions are not necessary in order to estimate the elasticities.

(ii) A priori restrictions of the values of elasticities or their constancy are not needed.

Let labour (L), capital (K) and natural resource product (N) be the factor inputs. The Translog cost function then can be expressed as:

$$\ln C = a_0 + \theta_1 \ln Q + \frac{1}{2}\theta_2 (\ln Q)^2 + \Sigma_i \beta_i \ln P_i + \frac{1}{2}\Sigma_i \Sigma_j \varepsilon_{ij} \ln P_i \ln P_j + \Sigma_i \delta_i \ln P_i \ln Q \qquad (10)$$

where $i = K, L, N$

$\Sigma_{ij} = \Sigma_{ji} \quad \text{for } i \neq j$

Humphrey and Moroney cautioned the comparison of elasticities of substitution estimates from the two Translog functions. They stated that the main differences between the two functions were the underlying theoretical assumptions and errors–in–variables problems.

4.2.4 Functions Used in the Study

For the purposes of this study, CES function and the Translog production function will be used, because value added and wage data are easily available. This information is collected by the Malaysian Statistics Department in their annual survey of manufacturing industries.

The Translog production function is chosen to give indication on whether human skill is a separate factor of production. Furthermore, comparison can be made on the substitutability of inputs. However, using this function poses a major data problem. Data on wage must be separated into skilled and unskilled workers groups. This information is not available in the published statistics. To overcome this problem, data at establishment level information on labour and capital is used. (See section 5.3 on the discussion of data availability).

It will also be of interest to see if the estimates from CES, which is for aggregated inputs, differ from those more disaggregated ones from the Translog function.

4.3 Review of Empirical Studies on Elasticity of Substitution

After the introduction of the CES function by ACMS in 196l, a large number of empirical studies were carried out. These studies first used mainly data from developed countries; but studies on less developed countries were done later. In order to draw effective conclusions from the many empirical studies on the elasticity of substitution, they will be separated here into:

(i) developed countries,

(ii) less developed countries and

(iii) inter–country studies.

4.3.1 Studies on Elasticity of Substitution in Developed Countries

The studies on elasticity of substitution consist of two types:

(i) cross–sectional studies and

(ii) time–series studies.

Generally the results from the cross–sectional studies are higher than those of time–series.

4.3.1.1. Cross–Sectional Studies, Developed Countries

These are mostly on U.S. manufacturing data. Nerlove[27] did an excellent review on cross–sectional and time–series estimates of the elasticity. The cross–sectional studies include those by Minasian (1961), Solow (1964), Dhrymes (1965), Liu and Hildebrand (1965) and McKinnon (1963b)[28]. Those studies use data from about the same period; Minasian – 1957, Solow – 1956, Liu and Hildebrand – 1957 and Dhrymes – 1957.

For a few sectors, such as tobacco manufactures, petroleum and coal and electrical machinery, the Minasian results differ substantially from Solow. For other sectors the results are consistent; their values are different from one but

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[27] Nerlove, M., 1967. "Recent Empirical Studies of the CES and Related Production functions", in Brown, M (ed.), The Theory and Empirical Analysis of Production, New York, Columbia University Press.

[28] For a complete bibliography see Nerlove, ibid.

fall evenly on either side of the value one. The reasons for these differences are the type of data and period used. Although Dhrymes uses the same data as Minasian, his results are different because he uses two different regression equations. The divergence of results obtained may be caused by the measurement of capital stock; Dhrymes regards it as a test of the perfect-competition and constant-return-to-scale hypothesis of the standard formulation.

The Liu-Hildebrand estimates use two types of data: (1) involving all employees and (2) only considered production workers. The results are a bit mixed; some elasticity of substitution is larger than Solow and Minasian while in other sectors smaller. The explanation of difference between Liu-Hildebrand and others may be in the multicollinearity that exists between the variables when the function is really a Cobb-Douglas one.[29]

Ferguson (1963)[30] and Bell (1964)[31] estimate the elasticity of substitution in U.S. manufacturing industries using 1956 and 1947/1954/1958 data respectively. The general finding from both studies is that the value of elasticity is not significantly different from one.

Griliches[32] carried out a study of 17 U.S. manufacturing industries. His 1958 data is at the two-digit level. Griliches' estimates are comparable to and generally have the same order of magnitude as Minasian and Solow. Out of 17 estimates, only one is significantly above unity.

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[29] This reason was given by Griliches and Mieszkewski. See Nerlove, ibid., page 82.

[30] Ferguson, C.E., 1963. "Cross-Section Production Functions and the Elasticity of Substitution in American Manufacturing Industry", Review of Economics and Statistics, Vol. XLV(3).

[31] Bell, F.W., 1964. "The Role of Capital-Labour Substitution in the Economic Adjustment of an Industry Across Regions", Southern Economic Journal, Vol. XXXI(2).

[32] Griliches, Z., 1967. "Production Functions in Manufacturing: Some Preliminary Results", in Brown, M. (ed), The Theory of Empirical Analysis of Production, New York, Columbia University Press.

Zarembka[33] calculated elasticities for 13 industries using 1957 and 1958 data. Eight of the industries have elasticities near unity while the rest are significantly lower. The main objective of Zarembka's study is to see whether a difference in the estimation period would effect the elasticity, (as concluded by Nerlove[34]). Zarembka found that results from the two years (1957 and 1958) are the same.

Bell found that by using capital data, the elasticity estimates become higher. Using the U.S. manufacturing data of 1958, Bell's estimates are higher than those of Arrow et.al. and more in agreement with Ferguson.

4.3.1.2. Time Series Studies, Developed Countries

The Nerlove survey of time series studies includes those by Kravis (1959), Arrow et.al. (1961), Diwan (1963), Kendrick and Sato (1963), Brown and de Cani (1963), Kendrick (1964), Ferguson (1965a)[35]. These studies estimated the aggregate elasticity of substitution for the United States. Other estimates of the U.S. manufacturing industries (at two digit level) are by McKinnon (1962 and 1963a), Lucas (1963), Kenderick (1964), Maddala (1965) and Ferguson (1965b).[36]

The estimates of the elasticity from the aggregate studies are very much less than one, ranging from 0.37 to 0.68. Only Ferguson, using 1948–63 data, obtained the value of 1.16 for elasticity.

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[33] Zarembka, P., 1970. "On the Empirical Relevance of the CES Production Function", Review of Economics and Statistics, Vol LII.

[34] Nerlove (1967), op.cit., page 58 concluded that "even slight variation in period or concepts tend to produce drastically different estimates of the elasticity".

[35] For the complete bibliography see Nerlove ,ibid.

[36] These studies are also mentioned in Nerlove, ibid.

The estimates for the two–digit level produced varied results. Ferguson's estimates are the highest, with nine out of nineteen cases having the value of 1.0. McKinnon (1962) used a slightly different period and type of data, and produced estimates quite different from Ferguson. The McKinnon's estimates range from 0.033 to 1.021. The reason for this difference is McKinnon used deflated data while Ferguson used current–dollar values.

Although Maddala used roughly the same period as McKinnon (1962), their results do not agree, because Maddala used a different form of equation. Lucas estimated for the period 1931–58 and his results are higher than both McKinnon and Maddala.

The studies by McKinnon (1963a) and Kendrick differ from those mentioned earlier because they are based on widely separated points in time; McKinnon on eight points; 1899, 1909, 1919, 1929, 1937, 1948, 1953 and 1957 and Kendrick on two points, 1953 and 1957. Kendrick computed an arc elasticity of substitution by comparing the capital–labour ratio with the relative price ratio in those two years. Because it is only based on two data points, the estimate is very unstable. The results of these two studies show a few industries to have a value of more than one and the majority of the industries to be less than one. Because of the nature of period used in two studies is different from the others, there is little consistency between the results.

Brown[37] using 1948–1960 data, found that none of his thirteen estimates exceeded the value of 1.0; three estimates had the value less than one and the rest were not significantly different from one.

Berndt[38] agreed with the Nerlove conclusion that the estimates of

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[37] For summary of the result, see Griliches (1967), op.cit., Table 1, page 287.

[38] Berndt, E.R., 1976. "Reconciling Alternative Estimates of the Elasticity of Substitution", Review of Economics and Statistics, Vol.XLIII.

elasticity of substitution are extremely sensitive to differences in estimation form and data measurement. In trying to improve the accuracy of these estimates, Berndt compiled more detailed data on capital in U.S. manufacturing for the years 1929–68. Two estimation methods were employed, namely the ordinary least squares (OLS) and two stage least squares methods(2SLS). The OLS results ranged between 0.96 and 1.23 and are lower than those of 2SLS which are between 1.14 and 1.24. Another conclusion is that the OLS estimates approach unity as better methods of data measurement are used.

4.3.2 Studies on Elasticity of Substitution in Less Developed Countries

As with the studies for developed countries, the approaches have been split into:

(i) cross–sectional and
(ii) time series.

4.3.2.1. Cross–Sectional Studies, LDCs

The Bruton[39] (1972) review of studies included those by Katz (1969) and Bruton (1960, 1965). Katz estimated the elasticity of fifteen Argentinian industries in 1946 and ten industries in 1954. The estimates for 1946 range between 0.45–2.02 and for 1954 between 0.47–1.73. Although there is considerable variation between the estimates for any given industry in each of the two years, the ranking of industries involved in the study remains the same.

Bruton studied the Mexican elasticity of substitution for two–digit data (1965) and four–digit data (1960 and 1965). The two–digit estimates ranged from

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[39] Bruton, H.J., 1972. "The Elasticity of Substitution in Developing Countries", Research Memorandum No. 45, Center for Development Economics, Williams College

0.75–1.08. The results from four–digit data are less than those from two–digit data[40]. This supports the Solow suggestion that elasticities of two–digit sectors are greater than those of four–digit sectors because of the greater possibility of product substitution in the larger two–digit sectors. The four–digit estimates are not very consistent among themselves when three different equations are used. Nevertheless, it was shown that elasticity of substitution still existed.

Gaude[41] looked at studies by Sicat (Philippines), Reynolds and Gregory (Puerto Rico), Oyelabi (Nigeria) and Ericksson (five Latin American countries).

Sicat used Philippines 1960 data at industry level and the results for six of the industries studied were comparable with Katz (1954). The estimates for these industries are around the value 1.0.

Reynolds' and Gregory's estimates for Puerto Rico, on average, are not significantly different from 1.0. An interesting aspect of the Reynolds and Gregory study was that the elasticity of substitution for the local industries is less than that of export industries.

Oyelabi showed that there was substitution of factors of production in Nigeria. Elasticities for four industries have values close to 1.0, two others around 1.6 and only one industry has elasticity of 0.74.

In Eriksson's study of Latin America the elasticity tended to be less than unity for every country except Colombia. These results, together with those obtained by Reynolds and Gregory, conclude that Colombia, Mexico and Puerto Rico have similar elasticity of substitution.

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[40] The equation for these estimates used the relationship between average value added of capital and an estimated rental rate.

[41] Gaude, J., 1981. "Capital-labour Substitution Possibilities. A Review of Empirical Evidence", in Bhalla, A.S.,(ed), Technology and Employment in Industry, International Labour Office, Geneva.

Tyler[42] studied the elasticity of substitution for Brazilian manufacturing using 1959 data. Total manufacturing has an elasticity of 1.0 but the industries' results are distributed normally: Twelve industries have values between 0.8 – 1.1, five industries less than 0.8, five others more than 1.1 Tyler's result does not support the hypothesis that the elasticity of capital–intensive industries is lower than labour–intensive ones. Another conclusion from this study is that elasticity is not correlated with type of industry ownership.

4.3.2.2. Time Series Studies, LDCs

The Bruton[43] survey of empirical studies on elasticity of substitution includes three time series studies. They are Daniels, Katz and Williamson[44]. The countries covered by Daniels are Argentina, Chile, El Salvador, Korea, Paraguay, Peru, Portugal and Spain. Data for these countries over the period 1954–1961 was pooled and elasticity of substitution was estimated at the industry level. The results range from 0.38 to 1.8. Eight of the seventeen industries have elasticity greater than unity. Since all elasticities are significantly different from zero, it is clear that there exists substitution of production factors in manufacturing sector for these countries.

The Williamson study of the Philippines manufacturing sector was for the period 1957 to 1963. All estimates are greater than one with the exception of two industries which are both capital goods industries and have elasticity of less than one. Unfortunately, there is no corroborative evidence from other studies to support this result.

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[42] Tyler, W.G., 1974. "Labour Absorption with Import-Substituting Industrialisation: An Examination of Elasticities of Substitution in the Brazilian Manufacturing Sector", Oxford Economic Papers, Vol. 26, No. 1, March.

[43] See Bruton (1972), op.cit.

[44] See Bruton, ibid., for bibliography.

Katz used both cross–sectional and time–series data to estimate the elasticity for the Argentinian manufacturing sector. For 1946, fifteen industries were considered and ten industries for 1954. The 1946 results are between 0.45 – 2.02 and the 1954 results are 0.47 – 1.73. There are considerable variations between the estimates of any given sector for the two years but the ranking of the sectors remains relatively unchanged from one year to the other.

The Gaude[45] review of elasticity of substitution in the less developed countries included studies by Bruno (Israel), Diwan and Gujarati (India), Harris and Todaro (Kenya) and Behrman (Chile).

The Bruno study used a new production function which first linked labour productivity linearly to the real wage and then linked the marginal product of labour to the real wage rate. On average, the elasticity was found to be small; mostly less than one. The study used 1953–1964 data on manufacturing and the entire private sector.

The Diwan and Gujarati[46] results for several manufacturing industries in India for the period 1946–58 proved to be (on average) less than unity. Harris and Todaro obtained almost the same kind of result (i.e. less than unity) for Kenya. The average Harris and Todaro elasticity of substitution is 0.8 and this result is possibly an over–estimation because the output and wage data were not deflated.

Eight sectors of the economy were considered in the Behrman[47] study of Chilean elasticity of substitution. The long–run elasticity was found to be higher than the short run one. Among the eight sectors, manufacturing has the second

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[45] Gaude (1981), op.cit.

[46] For detailed results see Gaude, ibid., Table 6, page 56.

[47] Behrman, J., 1972. "Sectoral Elasticities of Substitution between Capital and Labour in a Developing Economy: Time Series Analysis in the Case of Postwar Chile", Econometrica, Vol. 40, No. 2, March.

highest estimate with the value of 0.76 (long–run). Behrman found that the Chilean estimates for agriculture, services, construction and government are lower than the economic development literature seemed to assume. One of the conclusions of the study is that the low elasticity and the long adjustment period supports the Eckaus technological explanation of the existence of under– or unemployed labour.

Pack[48] made a micro study of elasticity of substitution in Kenya. Forty two plants, covering a wide range of the manufacturing sector, were investigated. Substitution was studied at each processing stage. The method used in estimating the elasticity was to compare the change in unit cost when more labour was used and when more capital was used. The results show little scope for efficient substitution.

4.3.3 Inter–Country Studies of Elasticity of Substitution

Arrow et.al. (1961)[49] did a three–digit multi–country comparison of elasticity of substitution. Nineteen countries were involved and data used was for the period 1950–1955. This study also included a comparison of U.S. and Japanese elasticities at the two–digit level. Between the nineteen countries, elasticity of substitution varies from 0.72 to 1.01. The U.S. and Japanese comparison confirms the existence of flexible elasticity of substitution.

Fuchs (1963)[50] also used the Arrow et al three–digit data but calculated new regression equations that incorporated a dummy variable in order to differentiate between developed and developing countries. Fuchs' results exceed those obtained by Arrow et. al.

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[48] Pack, H., 1976. "The Substitution of Labour for Capital in Kenyan Manufacturing", Economic Journal, Vol. 86, No. 341, March.

[49] Arrow et.al.(1961), op.cit.

[50] Fuchs, V.R., 1963. "Capital Labour Substitution, A Note", Review of Economics and Statistics, Vol. XLV.

Murata and Arrow (1965)[51] calculated the elasticity for two–digit level data in 1953–1956 and 1957–59. The results are comparable to Arrow et.al. One aspect explored by Murata and Arrow was the influence of the level of data disaggregation on the elasticity of substitution. It concludes that the level of disaggregation has little effect on the elasticity of substitution.

The eight countries included in Daniel's[52] study are Argentina, Chile, El Salvador, Korea, Paraguay, Peru, Portugal and Spain. Data from various years between 1954 and 1961 was used. The results range from 0.38 to 1.80, and eight out of the seventeen industries have elasticity greater than one.

Clague[53] estimated the elasticity of substitution in less developed countries by using capital–labour ratios and factor prices for Peru, based on a comparison with the United States. Two types of data were considered: (1) actual plant data and (2) engineering estimates. The elasticities for eleven manufacturing industries when using engineering estimates were found on average to be less than 0.5. The estimates from actual plant data are even lower than those from engineering estimates.

The Behrman[54] study for the period 1967–73 covered 70 countries grouped as follows:

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51 Murata, Y. and Arrow K.J.(1965), in Nerlove (1967), op cit. Unpublished results of estimation of elasticities of substitution for two digit industries from intercountry data for two periods.

52 See Bruton (1972), op.cit.

53 Clague, C.K., (1969). "Capital-labour Substitution in Manufacturing in Underdeveloped Countries", Econometrica, Vol. 37, No. 3, July.

54 Behrman, J.R., 1982. "Country and Sectoral Variations in Manufacturing Elasticities of Substitution between Capital and Labour" in Krueger, A.O. (ed.), Trade and Employment in Developing Countries: Factor Supply and Substitution, Vol. 2, Chicago, University of Chicago Press for National Bureau of Economic Research.

12 low income

35 middle income

18 industrialised

2 capital–surplus oil exporters

3 centrally planned economies

Sectoral dummy variables and proxies for country characteristics were used in order to give proper weightage to sectoral and country differences. Two different estimating equations produced two different results:

(i) If value added per worker was the dependent variable, the elasticity is 0.94.

(ii) If wage rates were the dependant variable the elasticity is 1.43.

After considering the bias involved in the two methods, it was concluded that the elasticity was not significantly different from that of the Cobb–Douglas function.

Reasons for Inconsistency of Elasticity of Substitution Estimates

Three main reasons for inconsistency of results are given below:

(1) Economic specification reasons forwarded by various writers, such as:

(i) Unrealistic assumptions about the adjustment of production units towards profit–maximising factor combination.

(ii) Inaccuracy in aggregation and definition of variables such as capital, labour and output.

(iii) Difficulties in incorporating technical change and varying rates of capital utilization over time.

(iv) Multi–country estimates are susceptible to errors arising from the non–uniformity of definitions of data used

(v) Doubts concerning the validity of the production function assumptions.

(2) Statistical bias can originate from the choice of estimation method; i.e. either using the indirect or direct method. Other sources of bias include identification bias, simultaneous equation bias and serial correlation bias.

(3) The choice of either a time–series or cross–sectional type of study can also cause differences in the results obtained.[55] For the former the choice of duration of time period is important because of the predominant influence of short–run business cycle phenomena. Simultaneity and mis–specification of the lag structure can result in significant bias to the estimates. If cross–sectional studies are used instead, inconsistency may arise because such studies disregard differentials in the price of output and quality of labour.

In conclusion, it is difficult to be exact about the magnitude of elasticity of substitution under various conditions. Nonetheless, it can be said that elasticity of substitution does exist, to a greater or lesser extent. Hence, there is the opportunity for national economies to respond to changes in international trade. The popular conception that LDCs, with access only to rigid imported technology, have lower elasticity of substitution than developed countries may be wrong. Possibly, LDCs can be flexible in their response to the uneven growth of factors of production, at least some of the time.

The inconsistency of macro–level estimates highlights the need for a micro–level study, so that more accurate estimates can be obtained. Therefore, this study plans to investigate the consistency of macro–level elasticity of substitution with indicators from the establishment level.

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[55] For more detailed discussion see Griliches (1967), op.cit., and O'Herlily, C. St. J., 1972. "Capital-labour Substitution and Developing Countries: A Problem of Measurement", Bulletin of the Oxford University Institute of Economics and Statistics, No. 34, August.

4.4 Review of Studies of Malaysian Elasticity of Substitution

The employment creation capacity of the manufacturing sector has been under close scrutiny, because this sector was thought to be the main absorber of labour, through labour–intensive industry. But the success of the manufacturing sector in providing employment opportunities depends on two things: (i) the elasticity of substitution and (ii) the relative prices of labour and capital. In this review we discuss the former.

If an industry's elasticity of substitution is greater than one, the industry is able to substitute capital with labour. Thus the industry will use a higher proportion of labour. Industries in Malaysia which change from capital–intensive processes to labour–intensive ones can thus fulfil one of the primary objectives of the Malaysian industrialisation plan.

More often than not, the technology used in the manufacturing sector is imported from developed countries, where capital is abundant, and thus the technologies are very likely to be capital–intensive. This is especially so in high–technology industries and in subsidiaries of multinational corporations. In situations such as these the elasticity of substitution is usually zero; meaning there is no substitution between capital and labour.

The earliest studies on elasticity of substitution in Malaysia were done by Lim, Thillainathan and Osman–Rani using the 1968 census data[56]. Even though the data was for the same year, the three authors used different classifications: Lim used the 18 industrial groups; Thillainathan calculated for the total manufacturing sector and four other subsectors (food; timber–based;

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[56] Lim, D.,1973. Economic Growth and Development in West Malaysia 1947-1970, Kuala Lumpur, Oxford University Press.

Thillainathan, R., 1969. " Production Functions in the West Malaysian Manufacturing Sector", Kajian Ekonomi Malaysia, Vol VI, No. 2, December.

Osman-Rani, H., 1978. "Employment Aspects of Industrialisation: Malaysia's Experience", Occasional Paper, No. 9, April, Faculty of Economics, National University of Malaysia..

chemical products and metal; machinery, electrical goods and transport equipment). Osman–Rani grouped the data according to their sales size. Lim and Thillainathan used the same model; Constant Elasticity of Substitution Production Function (CES), while Osman–Rani considered the Dhrymes model, which allows market imperfections and variable returns to scale, to be more suitable.

While Osman–Rani grouped the establishments by their sales size, Anwar[57] categorized according to the number of employees. Anwar's study extended the 1968 data to include 1963 and 1973. The CES model was used to calculate the elasticity of substitution.

A more detailed study of elasticity of substitution was carried out by Hoffmann and Tan[58] using the 1970 survey data. A cross–section study for 55 industries used four models:

(i) The ACMS model
(ii) The Diwan model
(iii) The VES–function
(iv) The linearisation of the logarithmic form of the CES function, known as the Kmenta model.[59]

In their study, Hoffmann and Tan linked the elasticity of substitution with capital intensity and with establishment size.

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57 Anwar, A., 1982. Industrialisation and Employment Creation in a Developing Economy: An Analysis on Malaysia , Ph.D. dissertation, University of Kent, Canterbury, unpublished.

58 Hoffman, L. and Tan, S.E., 1980. Industrial Growth, Employment and Foreign Investment in Peninsular Malaysia, Kuala Lumpur, Oxford University Press.

59 For the ACMS model see Arrow, Chenery, Minhas and Solow (1961), op. cit. For the Diwan model, see Diwan, R.K; 1964/65. "An Empirical Estimate of the Constant Elasticity of Substitution Production Function", Indian Economic Journal, Vol. 12, Bombay.

For the VES function see Lu and Fletscher (1968), op. cit. For the Kmenta model see Kmenta, J., 1967. "On Estimation of the CES Production Function", International Economic Review, Vol. 8, No. 2, June.

The concept of instantaneous elasticity of substitution was introduced by Gan.[60] This concept took into consideration the capital utilisation rate in the calculation of elasticity of substitution. Labour usage in production depends on the capital utilisation rate; that is, the higher the capital utilisation rate the more labour is used. Since the utilisation rate is found to be low[61] , the labour usage can be increased instantaneously if the utilisation is increased. Data from a survey of 79 manufacturing establishments carried out in 1972 was used for this purpose.

Maisom calculated the only time-series estimates of elasticity of substitution.[62] Estimates were made for 50 industry groups (5 digit Malaysian Industrial Classification) for the period 1963-84. The study focused on the comparison of two methods for estimating the elasticity; CES and Translog Cost functions. It was found that the Translog estimates are similar to those of CES.

Results of the studies on elasticities of substitution in the Malaysian manufacturing sector are rather mixed. Osman–Rani found that elasticities of substitution ranged between 0.3–0.5 irrespective of establishment size. Results from Hoffman and Tan agree with Osman–Rani; out of 55 industries, 35 have elasticity of less than one. Gan's elasticities of substitutions are also greater than zero but less than one.

Maisom also found the elasticities to be quite low; 34 out of the 50 industry groups had elasticity less than one while 16 had more than one. However, Maisom also produced some rather unexpected results; for example the highest elasticity belonged to petroleum refining (3.51) and the lowest to clothing manufacturing (-1.27). Since petroleum refining is very capital-

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60 Gan, W. B., 1976. "A Note on the Empirical Estimates of Instantaneous Elasticity of Substitution", Asian Economies, No. 17, June.

61 Gan, W.B., 1974. Capital Utilisation in West Malaysian Manufacturing Sector: A Case Study of Eleven Manufacturing Industries, M.Ec. Thesis submitted to the Faculty of Economics and Administration, University of Malaya, unpublished.

62 Maisom, A., 1989. Capital-labour Substitutability in Malaysian Manufacturing: Alternative Estimates and Policy Implications, Ph.D dissertation, Iowa State University, unpublished.

intensive, it is quite difficult to explain such elasticity. On the other hand, Hoffman and Tan found clothing manufacturing to be quite elastic (0.83). Maisom's estimates from the two methods are found to be inconsistent with one another and also with those by Hoffman and Tan. These differences may be due to the type of data used; Maisom used time-series while Hoffman and Tan used cross-sectional data.

In contrast to these studies, three of the five industries in Thaillainathan's studies have elasticities greater than one while the other two are greater than zero. Lim's finding is similar to that of Thaillainathan, namely that most of the industries had significant elasticities of substitution.

Anwar's results are a little unstable in that the elasticities of substitution change drastically within a short space of time (5 years).

The overall conclusion is that wage policy or increase in wages does not significantly influence employment. One dissenting view is held by Lim, stating that wages influence the employment growth. Gan agrees with Lim that factor prices can increase employment on existing capital stock, albeit only in the very short term. Maisom suggested that in the long term, government should implement measures that will show the true prices of capital and labour, as this will help employment creation.

The relationship between elasticity of substitution and size of establishment proves to be inconclusive. Hoffman and Tan found that large establishments have higher elasticities of substitution while Anwar said the opposite; smaller establishments have higher elasticities of substitution. Osman–Rani's elasticities of substitution are about the same for all sizes of establishments.

The reason for these inconclusive results may be that the definition of establishment size differs and there is a strong influence of bias in the calculation of the elasticity.

Irrespective of some contradictory findings, one issue is clear; that the Eckaus formulation which assumes fixed factor proportions is not applicable in the Malaysian manufacturing sector. The elasticities of substitution were significantly greater than zero and in many cases greater than one.

4.5 Summary of Empirical Studies

The above studies show that substitution can take place between factors of production. Estimates from selected studies of developed countries, LDCs and Malaysia are compared in Table 4.1. These figures are averages of the various industries estimates. Estimates of Malaysian elasticity include those calculated in this study.

The elasticity for developed countries is higher than that of LDCs. However, the results of LDCs are mixed; some studies show low elasticities and some have values similar to developed countries. For example, Sicat found that for some LDCs elasticity is equal to that of developed countries, while Behrman showed that the former elasticity is low when compared to the latter.

Malaysian estimates are similar to those of LDCs but the elasticity values have decreased slightly.

Not only did the estimates of elasticity of substitution differ between developed countries and LDCs, the ranking of the industries was also inconsistent, as proved by Morawetz[63], and Burton[64]. Such inconsistency does not help in identifying industries with relatively high or low elasticity. Therefore, comparison of elasticity can only be made between country groups and not by industry.

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[63] Morawetz, D., 1976. "Elasticities of Substitution in Industry: What do we learn from Econometric Estimates?" World Development, Vol. 4, No. 1.

[64] Bruton (1972), op. cit.

Table 4.1
Comparison of Elasticities of Substitution

CROSS SECTIONAL STUDIES

	Developed Countries		Less Developed Countries		Malaysia		
Author	Liu-Hildebrand (1965)	Minasian (1961)	Sicat (1960)	Katz (1954)	Lim (1968)	This study (1979)	This study (1985)
Country	U.S.A	U.S.A	Philippines	Argentina			
σ	1.20	1.24	1.05	1.03	1.45	1.153	0.943

TIME SERIES STUDIES

	Developed Countries		Less Developed Countries		Malaysia
Author	Arrow et al	Kendrick-Sato	Diwan-Gujarati	Katz	Maisom
Country	U.S.A	U.S.A	India	Argentina	
Year	1909-49	1919-60	1946-58	1954-61	1963–84
σ	0.50	0.58	0.47	0.44	0.77

Note: σ = Elasticity of substitution

Chapter 5

ESTIMATION OF ELASTICITY OF SUBSTITUTION IN SELECTED MALAYSIAN INDUSTRIES

5.1 Introduction

The most disaggregated previous estimates of the elasticity of substitution were done by Hoffman and Tan at the 4 digit level of the Malaysian Industrial Classification (MIC). The latest estimates, at an aggregated level of broad sales size and employment were made for 1973 by Osman–Rani and Anwar[1]. This study intends to improve on these by:

(i) Estimating at a more disaggregated level, that is 5 digit–level (product level).

(ii) Make more recent estimates, that is for 1979 and 1985.

The year 1985 was chosen because it was the most up–to–date data available. Data from the year 1979 was also used for the purpose of comparison and to make this analysis of macro data compatible with the case study, which is at the micro level and is given in later chapters. Two industries were selected for the case study; (i) textile and wearing apparel and (ii) electrical and electronic appliances

The calculations were done in two parts:

(i) The elasticity of substitution between two factors of production, namely labour and capital. This part used data at establishment level which are separated into product groups.

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[1] Estimates by Hoffman and Tan, Osman-Rani and Anwar were discussed in the section 4.4 titled " Review of Malaysian Studies on Elasticity of Substitution " in chapter 4.

(ii) The elasticity of substitution between three factors of production namely unskilled labour, skilled labour and capital. Because of the small number of observations in certain 5 digit groups, data was pooled into export–oriented and domestic–oriented categories.

Section 5.2 looks at the models used in estimating the elasticity. Basically, there are two; the Constant Elasticity of Substitution (CES) for two factor estimation; and Translog for three factors. Under the two factor substitution, two variations of the the CES were introduced namely the Diwan and Variable Elasticity of Substitution models, in order to provide comparison with the CES estimates.

Data needs and availability is discussed in section 5.3. Attention is given to those required for the three factor substitution and classification of product groups into either export or domestic–oriented.

Results of estimation of both types of substitution are given in section 5.4 while comparison with earlier studies is made in section 5.5. Most of the estimates for both substitutions have the value around 1.0. Therefore substitution possibilities exist.

The three factor substitution shows that skill is not a separate factor of production and the three factor substitution can be reduced to two factors.

For textiles, the industry level estimates are found to be representative of the product level ones. However, this is not so for electrical/electronics. Elasticity of substitution for textile and electrical/electronic industries show that the results obtained in this chapter do not vary very much when compared to the earlier Malaysian elasticity estimates.

5.2 Models for Estimation of the Elasticity of Substitution

From the survey of literature in chapter 4, two types of function were selected as tools for estimating the elasticity. The following is a recapitulation. The functions are:

(i) The production function that estimates the substitution between two factors, in this case labour and capital.

(ii) The Translog production function for substitution between three factors; skilled labour (human capital), unskilled labour (labour) and physical capital (capital).

5.2.1 Two Factor Substitution

The most common production function used for this purpose is the CES function. But in this study two other estimation procedures will be included, to provide a comparison and a verification of the CES estimates. The two alternative procedures are the function developed by Diwan and the VES – function introduced by Lu and Fletcher. [2]

The CES production function is of the form:

$$V = \beta \left[\delta K^{-\rho} + (1-\delta) L^{-\rho} \right]^{-u/\rho} \qquad (1)$$

where V = value added
L = labour
K = capital
u = scale parameter
δ = distributive parameter
ρ = substitution parameter

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[2] Diwan R.K., 1964/65. "An Empirical Estimate of the Constant Elasticity of Substitution Production Function", Indian Economic Journal, Vol.12.

Lu,Y.C and Fletcher,L.B., 1968. " A Generalisation of the CES Production Function", Review of Economics and Statistics, Vol. 50.

Assumptions for this model are:

(i) There exists a well–defined relationship between V, L and K to efficiently produce V.
(ii) The function has constant return to scale.
(iii) Production behaviour approximates profit maximisation under perfect competition with a given real wage rate (W/L). (W is the total wage bill).
(iv) The function has constant elasticity of substitution;

$$\sigma = \frac{1}{1+\rho}$$

Since equation (1) could not be directly estimated, an indirect method using the marginal productivity condition for labour was used. With this method, the elasticity of substitution can be estimated by the equation:

$$\mathrm{Ln}\,(V/L) = a + \sigma\,\mathrm{Ln}\,(W/L) \qquad (2)$$

σ is the estimate for elasticity of substitution.

The second estimation method is the Diwan function which is in the form:

$$\mathrm{Ln}\,(K/L) = b + \sigma\,\mathrm{Ln}\,(W/L) \qquad (3)$$

It is a modification of CES function.

The third method is derived from the VES function:

$$\mathrm{Ln}\,(V/L) = c + d\,\mathrm{Ln}\,(W/L) + e\,\mathrm{Ln}\,(K/L) \qquad (4)$$

All three functions used the ordinary least squares (OLS) estimation method. For the CES and Diwan functions the elasticities can be obtained directly while for the VES–function it has to be calculated from the estimated parameters.

$$\sigma_{VES} = \frac{d}{1 - \frac{e\,V}{V - W}}$$

where d, e = the estimated parameters of the VES function

V = value added

W = total wage bill

5.2.2 The Translog Production Function

The Translog production function describes the relationship between value added and three factors of production. It may be written as:

$$\begin{aligned} \mathrm{Ln}\ V = {} & \mathrm{Ln}\,\alpha_0 + \alpha_1 \mathrm{Ln}\,X_1 + \alpha_2 \mathrm{Ln}\,X_2 + \alpha_3 \mathrm{Ln}\,X_3 \\ & + \frac{1}{2}\gamma_{11} (\mathrm{Ln}\,X_1)^2 + \gamma_{12} (\mathrm{Ln}\,X_1)(\mathrm{Ln}\,X_2) \\ & + \gamma_{13} (\mathrm{Ln}\,X_1)(\mathrm{Ln}\,X_3) + \frac{1}{2}\gamma_{22} (\mathrm{Ln}\,X_2)^2 \\ & + \gamma_{23} (\mathrm{Ln}\,X_2)(\mathrm{Ln}\,X_3) + \frac{1}{2}\gamma_{33} (\mathrm{Ln}\,X_3)^2 \end{aligned} \tag{5}$$

where $X_1 = K$ = capital
$X_2 = L$ = unskilled labour
$X_3 = S$ = skilled labour

A symmetry condition ($\gamma_{ij} = \gamma_{ji}$) is imposed in order to derive equation (5) from its original form. Assumptions for the function are:

(i) The function is homogeneous of degree one (constant return to scale) in input quantities.

(ii) The input function is weakly separable from all other inputs in the production function.

(iii) Technical change affecting input function is Hicks – neutral.

Using the constant return to scale assumption, the cost shares are equated with logarithmic marginal products:

$$M_1 = \alpha_1 + \gamma_{11} \operatorname{Ln} X_1 + \gamma_{12} \operatorname{Ln} X_2 + \gamma_{13} \operatorname{Ln} X_3$$
$$M_2 = \alpha_2 + \gamma_{12} \operatorname{Ln} X_1 + \gamma_{22} \operatorname{Ln} X_2 + \gamma_{23} \operatorname{Ln} X_3$$
$$M_3 = \alpha_3 + \gamma_{13} \operatorname{Ln} X_1 + \gamma_{23} \operatorname{Ln} X_2 + \gamma_{33} \operatorname{Ln} X_3 \qquad (6)$$

The parameters of the Translog function will be estimated using the above three semi–logarithmic equations (equation 6).

OLS or 2SLS methods would cause simultaneous equation bias because the error terms of one equation may be correlated with those in the other two equations. This is because the factors influencing an error term in one equation will also influence the other error terms.

The three equations will produce two estimates of those parameters which appear in more than one equation namely; γ_{12}, γ_{13} and γ_{23}.

To overcome this, a restriction is imposed; cost shares M_1, M_2 and M_3 sum to unity at each observation.

$$\begin{aligned}
\alpha_1 + \alpha_2 + \alpha_3 &= 1 \\
\gamma_{11} + \gamma_{12}^{2} + \gamma_{13}^{3} &= 0 \\
\gamma_{12}^{1} + \gamma_{22} + \gamma_{23}^{3} &= 0 \\
\gamma_{13}^{1} + \gamma_{23}^{2} + \gamma_{33} &= 0
\end{aligned}$$

γ_{12}^{1} and γ_{12}^{2} denote estimates of γ_{12} in equation 1 and 2 respectively.

Hence, of the twelve estimated parameters, only eight are free; the parameter estimates from any one of the three equations can be derived from the parameter estimates of the other two equations.

For this study, M_2 and M_3 will be chosen as the estimated equations. Thus, the following restrictions were introduced in the calculation.

$$\gamma_{23}^{2} = \gamma_{23}^{3}$$
$$\gamma_{12}^{2} = -(\gamma_{22} + \gamma_{23}^{2})$$
$$\gamma_{13}^{3} = -(\gamma_{23}^{3} + \gamma_{33})$$

Since the OLS or 2SLS would not be the appropriate estimation procedures, the two stage method suggested by Zellner[3] (known as Zellner Efficient Estimation function or ZEF) may give more efficient parameter estimates. The problem with this method is that the estimates are not independent of the equations used.

An alternative method could be the maximum–likelihood whose parameter estimates are invariant from the equations chosen. Kmenta and Gilbert[4] have shown that an iterative ZEF (IZEF) will have parameter estimates that converge to the maximum–likelihood ones. Hence, IZEF will be used as the estimation procedure because it is more efficient than OLS or 2SLS and its estimates are computationally equivalent to maximum–likelihood estimates.

The parameter estimates from IZEF method will then be used to calculate the elasticity of substitution. Allen's[5] definition of partial elasticity of substitution is:

$$\sigma_{ij} = \frac{|G_{ij}|}{|G|}$$

where $|G|$ is the determinant of

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3 Zellner, A., 1962. "An Efficient Method of Estimating Seemingly Unrelated Regressions and Tests for Aggregation Bias", Journal of American Statistical Association, No. 57, June, pages 585-612.

4 Kmenta, J. and Gilbert, R.F., 1968. "Small Sample Properties of Alternative Estimators of Seemingly Unrelated Regression", Journal of the American Statistical Association, No. 63, December, pages 1180-1200.

5 Allen, R.G.D., 1938. Mathematical Analysis for Economists, London, Macmillan.

$$
G = \begin{pmatrix} 0 & M_1 & M_2 & M_3 \\ M_1 & \gamma_{11} + (M_1)^2 - M_1 & \gamma_{12} + M_1M_2 & \gamma_{13} + M_1M_3 \\ M_2 & \gamma_{12} + M_1M_2 & \gamma_{22} + (M_2)^2 - M_2 & \gamma_{23} + M_2M_3 \\ M_3 & \gamma_{13} + M_1M_3 & \gamma_{23} + M_2M_3 & \gamma_{33} + (M_3)^2 - M_3 \end{pmatrix}
$$

and $|G_{ij}|$ is the cofactor G_{ij} in G.

5.3 Data Availability

Data for the calculation of elasticity of substitution was obtained from the annual manufacturing survey conducted by the Malaysian Department of Statistics. The years 1979 and 1985 were chosen to coincide with the micro analyses in chapters 6 and 7. Unlike some other years, the 1979 and 1985 surveys used compatible questionnaires. (In order to improve the response rate, the Statistics Department used a simpler questionnaire in some other years. As a result, for example, for those years there is no breakdown of labour into skilled and unskilled categories).

The establishment level data obtained from the Statistics Department were put into product groups (5 digit level). There are seven groups for the textile and wearing apparel industry. The electrical and electronic appliances industry has 6 groups in 1979 but 8 in 1985. The reason is that the product group for components (38320 in 1979) is sub–divided in 1985 (38321 , 38322 and 38329).

The Department of Statistics surveys of 1979 and 1985 contain:

Table 5.1

Textile and Wearing Apparel Industry

Code	Type of Establishment	No. of Observations	
		1979	1985
32111	Natural fibre spinning & weaving mills	19	26
32112/3	Dyeing, bleaching, printing & finishing of yarns and handicraft spinning	35	13
32114	Batik making	50	21
32115	Synthetic textile mills	11	13
32120	Manufacture of made–up textile	16	16
32130	Knitting mills	87	60
32201/9	Clothing	173	183
		391	332

Table 5.2

Electrical and Electronic Appliances Industry

Code	Types of Establishment	No. of Observations	
		1979	1985
38310	Manufacture of electrical industrial machinery	31	29
38321	Radio, TV, sounding reproducing [a] and recording equipment	–	24
38322	Gramophone records & pre–recorded tape	–	6
38329	Semiconductors & other electronic components & communication equipment	–	75
38320	Television and manufacture of radio communication equipment and apparatus	87	–
38330	Manufacture of electrical appliances and housewares	16	18
38391	Manufacture of cables and wire	14	15
38392	Manufacture of dry cells and batteries	24	12
38399	Miscellaneous electrical apparatus	28	30
		200	209

Note: (a): In this study 38321 and 38322 will be grouped together because of inadequate number of observations in the latter. This group can be called electronic consumer product group.

The information provided by the Statistics Department included:

(i) Total net value of fixed assets (after depreciation)

Breakdown; machinery

transport equipment

buildings and land

(ii) Total employees

Breakdown; skilled

unskilled

(iii) Total wages paid

Breakdown; skilled

unskilled

(iv) Value added = value of total product manufactured

– value of total inputs consumed.

(Data on changes in stock were not available).

First, estimates were made of the elasticity of substitution for two factors of production; labour and capital. Labour is made up of skilled and unskilled employees and capital is represented by the net value of fixed assets.

Then in order to estimate substitution between the three factors (unskilled labour, skilled labour and capital) the 5 digit level groups were pooled into export–oriented or domestic–oriented industries.

Ideally, the T statistic discussed in chapter 1 should be used as the identification criterion[6] to determine if an industry belongs to the export–oriented

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[6] See section 1.3 on import substitution and export-oriented industries, for explanation.

$$T_i = \frac{C_i - P_i}{C_i}$$

where C_i = domestic consumption

P_i = domestic production

or domestic–oriented group. However the consumption data could not be obtained, because at the disaggregated 5 digit MIC level the export and import data, which is in SITC classification, is not compatible with the MIC classified production data.

A two level approach was adopted to overcome this problem. On the first level, the 1979 and 1985 survey questionnaires were used. Establishments were grouped by goods produced (5 digit level MIC). Then each of the establishment was examined and those with 50 per cent or more exports were classified as export–oriented establishments, the rest being domestic–oriented. If the majority of establishments in that product group were export–oriented ones, then the product group was identified as exported–oriented .

The identification was not very clear in the textile industry. Thus, the second level was introduced and the identification from the survey was double–checked with the Industrial Master Plan Report.[7] It was found that the identification from the survey was consistent with the Industrial Master Plan Report.

For the electrical and electronic appliances, the identification is clear and the second level analysis was not needed. Electronics was export–oriented, and electrical appliances domestic–oriented.

The product groups were thus identified as :

<u>Export–oriented</u>

Textile:

32111 Natural fibre spinning & weaving mills

32115 Synthetic textile mills

32130 Knitting mills

32201/9 Clothing

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[7] Government of Malaysia, 1985. <u>Medium and Long Term Industrial Master Plan</u>, Malaysia, Volume II Part 12, Textile/Apparel Industry and Volume II Part 8, Electronics and Electrical Industry.

Export–oriented

Electrical & Electronics:

38320	Television and manufacture of radio communication equipment and apparatus
38321	Radio, TV, sounding reproducing and recording equipment
38322	Gramophone records & pre–recorded tape
38329	Semiconductors & other electronic components and communication equipment

Domestic– oriented

Textiles:

32112/3	Dyeing, bleaching, printing & finishing of yarns and handicraft spinning
32114	Batik making
32120	Manufacture of made–up textiles

Electrical & Electronics:

38310	Manufacture of electrical industrial machinery
38330	Manufacture of electrical appliances and housewares
38391	Manufacture of cables and wire
38392	Manufacture of dry cells and batteries
38399	Miscellaneous

5.4 Results of the Estimation

The discussion of the results obtained is divided into two parts. The first part contains results of two factor substitution (tables 5.3 and 5.4) and the second part consists of the three factor substitution results (table 5.8).

5.4.1 Two Factor Substitution

For both industries the elasticities were calculated first at industry level, then divided into export– and domestic–oriented establishments and lastly at product level. Before analysing the results it may be helpful to mention a few sources of bias, among them:

(i) Data aggregration can be a source of bias. This can be verified by comparing the industry and product level elasticities.

(ii) In the VES function, the independent variables are also the dependent and independent variables in the Diwan function. If the latter have very high correlation amongst one another, this will result in multicollinearity in the former.

(iii) Net value of fixed assets is not truly representative of capital stock because of various shortcomings, some of which are: (1) the accounting depreciation rate may not reflect the actual value of capital stock and (2) physically heterogenous capital stock is accumulated at different times and price levels.

5.4.1.1 Textile Industry

The following analysis is based on the ACMS estimates while Diwan and VES estimates provide a variability comparison (see table 5.3). The VES estimates, in general, are higher than ACMS while Diwan's are more varied and sometimes even contradictory. The elasticity of substitution for the textile industry in general, has increased slightly from 1979 to 1985. The ACMS estimate for 1979 is 0.893 and 1985 is 1.173.

In 1979 the domestic–oriented part of the textile industry had higher elasticity than the export–oriented part , but by 1985 their elasticities had become similar. The values for domestic–oriented textile establishments in 1979 and 1985 are generally about 1.0. For export–oriented textile establishments, the value increased from 0.791 in 1979 to 1.19 in 1985.

Product group elasticities are quite varied in 1979; from a low of 0.54 (for 32111) to a highest of 1.39 (for 32120). But in 1985 the range of elasticities narrows and most product groups lie between 1.0 and 1.3.

Natural fibre spinning and weaving mills (32111) and synthetic textile mills (32115) have low elasticities, perhaps because of the nature of their production processes (they use relatively more machinery). The manufacture of made–up textiles (32120) has the highest elasticity (1.39). This type of establishment produces towels, umbrellas etc and can be very labour–intensive, so a high elasticity might be expected.

Clothing factories (32201/9), surprisingly have very low elasticity (0.659 in 1979). This activity is mainly making clothing and apparel and the bulk of the product is exported. Many workers are employed and usually little capital outlay is needed. The relatively high level of artisan skill required for this work is probably the reason why machines have not replaced people, (although in Europe, this process is just beginning, with cloth cutting by computerised laser beam).

Most of the estimates shown in table 5.3 are significant at 5 per cent level. Most of the estimated equations have quite low R^2, except for dyeing, bleaching, printing and finishing of yarns (32112). Generally R^2 does not exceed 0.5. Some of the Diwan equations show a very low R^2 { for example the estimate for 32201 (1979) has R^2 of 0.07}.

It can be said that elasticity of substitution exists in the textile industry and that it tends towards a Cobb–Douglas type of substitution. Substitutions at industry level do not vary significantly when compared with those at the product group level, in terms of trend and value. Hence, this industry's overall elasticity is representative of its more disaggregated products.

5.4.1.2 Electrical and Electronic Appliances Industry

Table 5.4 displays some contradiction between the total industry and individual product group estimates and also between different estimation methods.

Table 5.3

Estimated Two Factor Elasticities of Substitution for the Textile Industry and its Product Groups, 1979 and 1985

Textile Industry	No. of establishments 1979	No. of establishments 1985	σ ACMS 1979	σ ACMS 1985	σ DIWAN 1979	σ DIWAN 1985	σ VES 1979	σ VES 1985
Textile	396	332	0.893 *	1.173 *	0.774 *	1.337 *	1.033@	1.283@
Domestic-oriented	101	50	1.008 *	1.152 *	0.659 *	0.798	1.152@	1.128 *
Export-oriented	295	282	0.791 *	1.188 *	0.859 *	1.566 *	0.871@	1.303@
32111	21	28	0.543 *	0.839 *	0.372	0.985 *	0.688 *	1.002@
32112/3	37	15	1.056 *	1.285 *	0.45 *	0.881 *	1.342@	1.172 *
32114	52	23	0.768 *	1.029 *	0.074	0.033	0.853 *	1.126 *
32115	13	15	0.72	1.211 *	2.97 *	0.372	-0.237	1.277 *
32120	18	18	1.396 *	1.305 *	1.392 *	0.922	2.057@	0.959@
32130	94	62	0.83 *	1.182 *	0.74 *	1.267 *	1.167 @	1.328 *
32201/9	175	185	0.659	1.095 *	0.644 *	1.373 *	0.759@	1.270@

Note: * One parameter significant at 5 % level
@ Two parameters significant at 5 % level

The industry overall, shows a reduction in elasticity from 1.01 in 1979 to 0.713 in 1985 (table 5.4). The domestic–oriented establishments (mainly electrical) have a different trend; an increase from 0.816 to 1.105. The export–oriented group (electronics) has the same elasticity for both years (about 1:4).

Among the electrical establishments, two showed a decrease from 1979 to 1985 (38310 and 38399) and three an increase (38330, 38391 and 38392). Most elasticities are from 1.1 to 1.2 while manufacture of electrical industrial machinery (38310) is 0.8.

The elasticities of electronic establishments (38320) remain the same for 1979 and 1985. It is interesting to note that semi–conductor establishments (38329) have a very low elasticity of 0.468. Semi–conductor establishments

Table 5.4

Estimated Two Factor Elasticities of Substitution for the Electrical and Electronics Industry and its Product Groups, 1979 and 1985

Electrical & Electronic Industry	No. of Establishments		σ ACMS		σ DIWAN		σ VES	
	1979	1985	1979	1985	1979	1985	1979	1985
Elecrical & Electronics	200	210	1.014 *	0.713 *	0.845 *	0.613 *	1.161@	0.861@
Domestic - oriented	113	105	0.816 *	1.105 *	0.700 *	0.936 *	0.902@	1.222@
Export - oriented	87	105	1.413 *	1.408 *	1.043 *	1.254 *	1.599 *	1.437 *
38310	33	31	0.89 *	0.877 *	-0.264	0.509	0.576@	0.925 *
38320	89	-	1.413 *	-	1.043 *	-	1.599 *	-
38329	-	77	-	0.468 *	-	0.393 *	-	0.706@
38321/2	-	32	-	1.265 *	-	1.231 *	-	0.829 *
38330	18	20	1.122 *	1.279 *	1.701 *	0.672	1.103 *	1.505 *
38391	16	18	1.126 *	1.189 *	0.999 *	1.173 *	1.381@	1.538 *
38392	26	14	0.593 *	1.018 *	0.753 *	0.656	0.618@	0.900 *
38399	30	32	1.273 *	1.265 *	0.936 *	1.274 *	1.646@	1.208 *

Note: * = One parameter significant at 5 % level
@ = Two parameters significant at 5 % level

provide growth in the electrical and electronic industry. They employ large numbers of workers and are expected to continue to provide employment opportunities. Their low elasticities, however, indicate that employment is only likely to increase as a result of additional capital being installed; there is no advantage to be gained therefore in making the cost of labour lower as an incentive.

All the estimates of the electrical and electronic industry are significant at 5 per cent level, with the exception of a few by the Diwan function. The ACMS equations have reasonable R^2; between 0.4 to 0.6. R^2 for the Diwan and VES equations are quite low.

Aggregation bias appears to be negligible in the textile industry. Similarity of elasticity at industrial and product group level is a result of the broad range of goods produced . Thus, it is puzzling (given the electrical and electronic appliances industry is dominated by one main product, the semi–conductor) that the elasticity of this product group :

(i) is not particularly close to that for the whole industry (for example, industry elasticity for 1985 was 0.713 while export–oriented establishments registered 1.408).

(ii) does not change from 1979 to 1985 in the same way as the whole industry.

In summary the textile industry showed that the industry level estimate is representative of the product level but the electrical and electronic appliances industry indicated otherwise. Thus, it is important to estimate elasticity at the disaggregated level. Relying only on aggregated estimates for policy recommendations can be misleading.

5.4.2 Three Factor Substitution

For this section the data used was grouped into:

(i) Textiles:

export–oriented establishments, 1979 and 1985.
domestic–oriented establishments, 1979 and 1985.

(ii) Electrical and electronics:

export–oriented establishments, 1979 and 1985.
domestic–oriented establishments, 1979 and 1985,

Once again the comparison was made between the 1979 and 1985 data. The three factors of production chosen were capital (K), skilled labour (S) and unskilled labour (L).

The parameters were estimated from the M_S and M_L equations. The iterative Zellner estimation (IZEF) method was used. Another possible estimation method considered was the iterative three stage least squares method, but this was rejected owing to shortage of exogenous variables. The equations to be estimated are;

$$M_2 = \alpha_2 + \gamma_{12} \operatorname{Ln} X_1 + \gamma_{22} \operatorname{Ln} X_2 + \gamma_{23} \operatorname{Ln} X_3 + u_2$$
$$M_3 = \alpha_3 + \gamma_{13} \operatorname{Ln} X_1 + \gamma_{23} \operatorname{Ln} X_2 + \gamma_{33} \operatorname{Ln} X_3 + u_3$$

where 1 = capital
2 = unskilled labour
3 = skilled labour

Symmetry – constant return to scale restrictions are imposed;

$$\gamma_{23}^{2} = \gamma_{23}^{3}$$
$$\gamma_{12}^{2} = -(\gamma_{22} + \gamma_{23}^{2})$$
$$\gamma_{13}^{3} = -(\gamma_{23}^{3} + \gamma_{33})$$

The M_S and M_L equations were first estimated without the restrictions. The test statistics for these restrictions are given in table 5.5, and indicate that the symmetry–constant return to scale restriction is valid for all but one group. Thus, these hypotheses will be maintained in future analyses for all the groups (namely, industries). For each of the four subsectors, estimates for parameters from the M_S and M_L equations with symmetry–CRTS restrictions imposed are shown in table 5.6.

Table 5.5

Test Statistics for Symmetry - Constant Return to Scale Restrictions

Industry	Test Statistics	Degrees of Freedom	
Dotex 79	3.239	3 , 98	reject
Dotex 85	1.812	3 , 47	accept
Eotex 79	1.523	3 , 292	accept
Eotex 85	1.015	3 , 279	accept
Doelec 79	0.342	3 , 110	accept
Doelec 85	1.352	3 , 102	accept
Eoelec 79	0.587	3 , 84	accept
Eoelec 85	1.246	3 , 102	accept

Dotex = Textile domestic-oriented industry.
Eotex = Textile export-oriented industry.
Doelec = Electrical and electronics domestic-oriented industry.
Eoelec = Electrical and electronics export-oriented industry.

Table 5.6

Estimated Parameters of the Equations

Industry	Number of observations	α_L	α_S	γ_{KL}	γ_{LL}	γ_{LS}	γ_{KS}	γ_{SS}
Dotex 79	101	0.2401 *	0.3322 *	-0.0025	0.0712 *	-0.0686	-0.0145	0.0832 *
Dotex 85	50	0.0914	0.1350	0.0115	0.0607 *	-0.0722	0.0296	0.0426
Eotex 79	295	0.2748 *	0.0205 *	-0.0129	0.0628 *	-.0.0498	-0.0281	0.0780 *
Eotex 85	282	0.2976 *	0.7353 *	-0.0097	0.0689 *	-0.0591	-0.0352	0.0943 *
Doelec 79	113	0.1249 *	0.1761	-0.0014	0.0435 *	-0.0420	0.0132	0.0288
Doelec 85	105	0.1278 *	0.4052 *	0.0008	0.0452 *	-0.0461	-0.0088	0.0549 *
Eoelec 79	87	0.3714	0.6724 *	-0.0204	0.0443 *	-0.0238	-0.0410	0.0649 *
Eoelec 85	105	0.3042 *	0.2636	-0.0124	0.0399 *	-0.0275	0.0022	0.0253

Note:
* = Significant at 5 % level

Dotex = Textile domestic-oriented industry.
Eotex = Textile export-oriented industry.
Doelec = Electrical and electronics domestic-oriented industry.
Eoelec = Electrical and electronics export-oriented industry.

Tests for monotonicity and convexity will show whether the production function is a well–behaved one. To test for monotonicity, the fitted cost shares (M_i) should be positive for all observations. It was found however that all four groups' fitted values of M_L are negative and most M_S are positive. Thus, the production function is not monotonic and the output does not increase monotonically.

The bordered Hessians from the estimates are negative definite. This shows that the isoquants are convex. Hence, the production function only fulfils one condition as a well behaved function, that is of convexity.

Table 5.7 gives estimated elasticities of substitution between capital, skilled and unskilled labour. In general the elasticities are close to 1.0 with only two items exceeding 2.0. Looking at the elasticities for textiles and electrical and electronics industries there is relatively little difference between:

(i) σ_{KS}, σ_{KL} and σ_{SL}

(ii) 1979 and 1985.

However, this observation is not applicable to textile domestic–oriented industry. Elasticities for 1979 behave like all the other elasticities but those of 1985 are either too big a value ($\sigma_{KS} = 3.003$ and $\sigma_{KL} = 2.398$) or too small ($\sigma_{SL} = 0.528$).

The next test is of the functional separability between the three factors. First the complete global separability is tested, in other words a test for $\sigma_{KS} = \sigma_{SL} = \sigma_{KL} = 1$. The joint hypothesis of $\gamma_{KS} = \gamma_{SL} = \gamma_{KL} = 0$ is used. The test statistics (table 5.8) reject this hypothesis.

Since complete global separability is rejected, only one type of separability is possible; that is the one type separability.

Table 5.7

Estimates of Three Factors Elasticities of Substitution

	TEXTILE				ELECTRICAL and ELECTRONICS			
	Domestic-oriented Industry		Export-oriented Industry		Domestic-oriented Industry		Export-oriented Industry	
	1979	1985	1979	1985	1979	1985	1979	1985
σ_{KS}	1.0059	3.003	1.0072	1.0007	1.0150	1.000	0.9945	0.9881
σ_{KL}	0.9968	0.5284	0.9982	1.002	0.9993	1.000	1.0012	1.001
σ_{SL}	0.9470	2.398	1.4341	1.4388	1.1741	0.8976	1.4114	1.3032

Table 5.8

Test of Complete Global Separability

Industry	Test Statistics	Degrees of Freedom	
Dotex 79	24.530	3 , 101	reject
Dotex 85	13.736	3 , 50	reject
Eotex 79	110.520	3 , 295	reject
Eotex 85	43.244	3 , 282	reject
Doelec 79	30.549	3 , 113	reject
Doelec 85	51.015	3 , 105	reject
Eoelec 79	27.499	3 , 87	reject
Eoelec 85	23.422	3 , 105	reject

Dotex = Textile domestic-oriented industry.
Eotex = Textile export-oriented industry.
Doelec = Electrical and electronics domestic-oriented industry.
Eoelec = Electrical and electronics export-oriented industry

The hypotheses are:

(1) $\gamma_{KS} = \gamma_{SL} = 0$ (if $\sigma_{KS} = \sigma_{SL} = 1$ it means that K and L are separate from S)

(2) $\gamma_{KS} = \gamma_{KL} = 0$ (if $\sigma_{KS} = \sigma_{KL} = 1$ it means that S and L are separate from K)

(3) $\gamma_{SL} = \gamma_{KL} = 0$ (if $\sigma_{SL} = \sigma_{KL} = 1$ it means that S and K are separate from L)

From table 5.9, which shows the test statistics for the above hypotheses, we accept the second hypothesis with the exception of both domestic–oriented and export–oriented textile industry in 1979. The first and third hypotheses are rejected.

Table 5.9
Test of One Type of Separability

Industry	Test Statistics	Degrees of Freedom	
Dotex 79	35.366 a	2 , 101	reject
	3.830 b	2 , 101	reject
	27.745 c	2 , 101	reject
Dotex 85	19.684	2 , 50	reject
	1.236	2 , 50	accept
	20.579	2 , 50	reject
Eotex 79	102.841	2 , 295	reject
	10.965	2 , 295	reject
	157.294	2 , 295	reject
Eotex 85	48.419	2 , 282	reject
	1.236	2 , 282	accept
	57.706	2 , 282	reject
Doelec79	35.781	2 , 113	reject
	0.261	2 , 113	accept
	45.814	2 , 113	reject
Doelec 85	56.382	2 , 105	reject
	0.465	2 , 105	accept
	74.919	2 , 105	reject
Eoelec 79	30.883	2 , 87	reject
	2.409	2 , 87	accept
	28.708	2 , 87	reject
Eoelec 85	10.304	2 , 105	reject
	1.436	2 , 105	accept
	34.753	2 , 105	reject

Note:

a: for the hypothesis $\gamma_{KS} = \gamma_{SL} = 0$
b: for the hypothesis $\gamma_{KS} = \gamma_{KL} = 0$
c: for the hypothesis $\gamma_{SL} = \gamma_{KL} = 0$

Dotex = Textile domestic–oriented industry.
Eotex = Textile export–oriented industry.
Doelec = Electrical and electronics domestic–oriented industry.
Eoelec = Electrical and electronics export–oriented industry

5.5 Findings

The disaggregation of data in the two factor substitution provides the opportunity of investigating whether elasticities in broad categories are different from those in individual product groups. For the textile industry variation of elasticity at the product level varies slightly from the overall industry level , but the differences are not very great. The elasticity trend at industry level is followed at the product group level. Elasticity between labour and capital increases from 1979 to 1985 but even the 1985 level is only around 1.0.

For the electrical and electronics industry, some of the product group elasticities have trends in opposite directions from those of the industry level. At the industry level, elasticity decreases from 1.014 in 1979 to 0.713 in 1985. Thus, it would be unreliable to regard the electrical and electronics industry level elasticity as representative of the all parts of that industry.

This indicates that industry level elasticity of substitution is not always representative of that of its products. This confirms the usual suspicion that aggregation can obscure the true picture. Therefore, to identify which section of manufacturing industry has the most potential for employment creation, one needs to study each product group separately.

Comparison with previously estimated elasticity of substitution proved to be difficult because:

(i) Only a small number of previous studies have estimated the Malaysian elasticity of substitution, the latest using 1970 data.

(ii) Most of the previous studies were at industry level or used different classifications altogether. There are no estimated elasticities at product group level for textile or electrical and electronic industries. The other classifications used were employment and capital size. None study the elasticities for domestic–oriented and export–oriented establishments .

Lim's[8] estimate of the textile industry elasticity of 1.03 in 1968 showed that industry has not changed its elasticity over the years since 1968. Compared with the 1985 result, elasticity is almost the same . This conclusion is further strengthened by Hoffman and Tan's estimate in 1970 (0.865). Lim's estimate for electrical machinery in 1968 (0.97) is in between the estimated values of 1.014 (1979) and 0.713 (1985) found in this study.

Hoffman and Tan's 1970 estimate of radio communications, electrical industrial equipment manufacturing and repairs (0.579) is not too far from the 1985 electrical and electronic industry value (0.713) given in this report.

For the three factor substitution, the elasticities do not change significantly from 1979 to 1985. Most of the values are near to 1.0. The test of separability also shows that there exists a consistent aggregate index of skilled labour (S) and unskilled labour (L). The test showed that skilled and unskilled workers can be grouped together; skill is not a separate and significant factor of production. It also means that skill is not a substitute for physical capital. Therefore, the three factor elasticities can be reduced to the usual two factor elasticity of labour and capital.

The finding that skill is not a separate factor of production does not entirely agree with findings from some developed and developing countries. For example, using data for United States, Griliches found that skilled labour is more complementary with capital than is unskilled labour with capital.[9] In another study Yahr concluded that the availibity of skill induces the entrepreneur to substitute labour for physical capital, at a given price.[10] Yahr's finding was based

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8 Lim, D., 1973. Economic Growth and Development in West Malaysia 1947-1970, Kuala Lumpur, Oxford University Press.

9 Griliches, Z., 1969. "Capital–Skill Complementarity", Review of Economics and Statistics, 51, pages 465–468.

10 Yahr, M.I., 1968. "Human Capital and Factor Substitution in the CES Production Function", in Kenen, P. and Lawrence, R., eds, The Open Economy: Essays on International Trade and Finance, (New York, Columbia University Press).

on data from 22 high and middle income countries. Both authors used similar estimation methods: multiple regression on two logarithmic equations.

On the other hand, studies such as Corbo and Meller support the conclusion that skilled and unskilled labour should be aggregated.[11] They used Chilean (a middle income country) manufacturing data at establishment level and used the Translog Production function as the estimation technique. Possibly different estimation methods have caused the contrasting results from this study and those such as Griliches' and Yahr's. As noted earlier, elasticity of substitution is very sensitive to variations in data or method of estimation, (discussed in section 4.3.3). Thus, it is not unexpected that the results might be different.

Another reason why skill is not a separate factor of production may lie with the data itself. The Malaysian Department of Statistics identifies skilled labour as "those who have received formal training (either in–service training or other types, e.g formal training in an institution) for their specific job"

Because of the general nature of this definition and its emphasis on "formal training", respondents might have underestimated the number of skilled workers in their establishments. For example, electronic establishments generally give short but structured on–the–job training (do respondents consider this formal or not?), while for textile establishments skill is gained through experience. Textile workers at the operational level do not undergo any formal training.

These two factors - method of estimation and data - might be the reasons for arriving at a conclusion that is contrary to the general belief.

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11 Corbo, V. and Meller, P., 1982. "The Substitution of Labor, Skill and Capital: Its implication for Trade and Employment", in Krueger, A.O., Trade and Employment in Developing Countries: Factor Supply and Substitution, Vol. 2, (Chicago, University of Chicago Press for National Bureau of Economic Research).

The rather general definition of "skilled" by the Department of Statistics, is not a fatal flaw in the data; indeed there is some merit in allowing respondents to exercise their own judgement as to whether employees are skilled or not, rather than using a definition based on scholastic achievement only (which is probably the only type of definition that could be supplied by the Department of Statistics).

However, it does appear possible that skilled and unskilled labour may be either separable or non–separable depending upon the calculation method adopted. Using the Translog function in this study and the Chilean study, the answer was skilled and unskilled labour are not separable. Other studies using other methods, give the opposite result.

With the above two points in mind, it is clear that the present result of separability of skilled and unskilled labour is not conclusive. Nor should it be disregarded as the data has been clearly (albeit subjectively) defined by respondents and the calculation method, when used in other middle income countries has produced much the same findings.

From the earlier studies and from the present estimates of two factor and three factor substitution, elasticity of substitution for the textile and electrical / electronics industries can be considered as the Cobb–Douglas type, because over the years elasticity has remained close to 1.0.

Even though these estimates have indicated that there are substitution possibilities, we need to supplement them with qualitative information about establishments responses to policy changes. This information is obtained through a case study carried out on two industries; textile and electrical/electronics. Together the elasticity estimates and qualitative information will give a comprehensive view of employment generation potential.

Chapter 6

CASE STUDY OF THE ELECTRICAL AND ELECTRONIC INDUSTRY

6.1 Introduction

Elasticity of substitution was calculated at the macro level in the last chapter and it was shown that both the textile and electrical/electronic industries have substitution possibilities: in 1985 the elasticities are 1.173 and 0.713 respectively. These estimates should be complemented with information about industries' technical ability to choose between alternative production techniques. Thus it is necessary to study industries' characteristics, performance and requirements at a micro level to provide a more complete picture of an establishment's role in employment creation. To this end a survey of textile and electrical/electronic industries was carried out at the establishment level.

The establishments included in the survey will be described in section 6.2 and the objectives of the study in section 6.3. The rest of the chapter (sections 6.4 to 6.7) will discuss the results obtained from the electrical and electronics part of the survey; chapter 7 will do the same for textiles.

The first task of this chapter is to distinguish between export–oriented establishments (EOEs) and domestic–oriented establishments (DOEs).

The EOEs and DOEs basic characteristics are quite different. EOEs are foreign owned, produce intermediate goods and are located in free trade zones. On the other hand, DOEs are locally owned, produce consumer (final) goods and are located in industrial areas. These basic characteristics are discussed in section 6.4.1. The influence of parent companies is very apparent among EOEs especially regarding the technology used.

Other differences between EOEs and DOEs can be grouped into two; factor intensity and productivity (section 6.5.1) and labour (sections 6.5.2 and 6.5.3).

In terms of generating employment, EOEs are better than DOEs because they:

i) have a smaller increase in capital intensity

ii) have a bigger average employment size

iii) have a higher proportion of unskilled workers

DOEs perform better at factor utilisation; their capital and labour productivity are higher.

The shared characteristics are only limited to three; no linkages to supporting industries, pioneer status is the most popular incentive and the highest wage increase is experienced among the production workers.

This study also compares establishments' performance between 1979 and 1985. Although Malaysia faced her deepest recession in 1985, both types of establishments increased output but only marginally for DOEs. If inflation is taken into account, DOEs output performance may even be stagnant.

From 1979 to 1985 EOEs increased their employment but for DOEs it was reduced. Both became more capital–intensive as indicated by steep increases in capital size and intensity. The recession in 1985 forced these establishments to lower their capacity utilisation. However, EOEs utilisation rate is higher than that of DOEs.

6.2 Survey of Selected Manufacturing Industries.

The data used in this chapter is derived from two separate surveys. Both surveys are stratified by activity. The first survey was done for a project on the comparative advantage of Malaysian manufacturing industries and was sponsored by the Institute of Developing Economies, Tokyo[1]. It was carried out in three stages:

(i) Textiles and cement in 1979 covering 115 and 4 establishments respectively.

(ii) Electrical and electronic appliances and wood processing in 1980 covering 60 and 14 establishments respectively.

(iii) Plastics products and steel in 1981 covering 57 and 85 establishments respectively.

The second survey was carried out in 1987 for this thesis and concentrated on only two industries, namely, textile and electrical and electronic appliances . The universe of this sample is based on the earlier 1979/1980 establishments, but its size is reduced to 38 (textiles) and 23 (electrical and electronics) respectively. The selection of this sample from the universe is random.

The rate of response to the second survey was satisfactory; well over fifty percent establishments responded (20 textile and 14 electrical and electronic appliances). Among the non–responding establishments, closure of business activity was found to be the major reason. This is especially true among apparel, batik and electrical consumer goods establishments. Closures in the textile industry mostly affected smaller establishments but also one large firm (turnover of $38 million in 1979). The reason cited was the reduced demand due to recession.

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1 Cheong, K. C., et al ,1981. "Comparative Advantage of the Textile and Cement Industries in Malaysia" Institute of Developing Economies, Tokyo, mimeograph series No.2.

Among the non–responding electrical and electronic establishments, the majority are smaller establishments producing consumer products and which have ceased production due to weak demand and competition from similar imported products. Two establishments in the industrial and communication equipment category have changed to new products which fall outside the electrical and electronic classification. Higher profitability was cited as the purpose of switching.

Establishments are classified according to the type of product made. Tables 6.1 and 6.2 indicate the classification and number of establishments sampled for each classification.

For the purpose of this study the 5 digit product groups are classified into either export–oriented or domestic–oriented industries. This classification follows the one used in the previous chapter.

Establishments in the export–oriented group export not less than 50 per cent of their products. In the domestic–oriented group all but two establishments conform to the criterion that they must market at least 50 per cent of their products domestically. Those two establishments are subsidiaries of multinational companies producing consumer goods and possess the export–oriented criterion. Hence, these establishments are reclassified as export–oriented.

The questionnaire used in the survey is attached in appendix C. The questions can be broadly grouped into five:

(i) Organisational structure
(ii) Products
(iii) Factors of production
(iv) Competitiveness
(v) Protection and government assistance

The information obtained is of two types, quantitative and qualitative. Quantitative data mainly looks at the value and volume of production, fixed assets, inputs, labour and factor intensity. The qualitative data is used for the appraisal of competitiveness, such as productivity, technology and protection .

Table 6.1 :

Distribution of Establishments Sampled By Activity for Textile Industry

Code	Activity	No. of Establishments
32111	Natural Fibre Spinning & Weaving Mills	4
32112	Dying, Bleaching, Printing, Finishing of Yarns & Fabric	2
32114	Batik Making	1
32115	Synthetic Textile Mills	1
32120	Manufacturing of Made Up Textile Goods, Except Wearing Apparel	2
32130	Knitting Mills	5
32201	Clothing Factories	5
Total		20

Table 6.2

Distribution of Establishments Sampled by Activity for Electrical and Electronic Appliances Industry

Code	Activity	Type of Product	No. of Establishments
38321	Radio, Television Sets	Consumer Products	8
38330	Manufacture of Electrical Appliances		
38329	Semi-conductors	Components	3
38310	Manufacture of Electrical Industrial Machinery	Industrial and Communication Equipment	1
38322	Sound Reproducing	Others	2
38391	Manufacture of Cables and Wires		
38392	Manufacture of Dry Cells and Batteries		
	Total		14

6.3 Objectives of the Case Study

The objective of the case study is to distinguish between EOEs and DOEs characteristics and to examine an establishment's employment generation capability. This capability is reflected in two ways; ability to absorb labour and establishment viability. Our analysis will compare:

(i) how they have responded to industrialisation policies introduced by the government. For example, a labour–intensive industry, producing below capacity will be more capable of responding to government policy on increasing employment than a capital–intensive industry. If a labour–intensive industry happens to be an export–oriented one, then promoting export–oriented industrialisation policy will have a positive effect on employment.

(ii) EOE and DOE vulnerability or strength in the face of changing global economic conditions; this is important in sustaining industrial growth.

(iii) EOEs and DOEs usage of factors of production.

Although production function estimates have proved the existence of substitution possibilities, they are only meaningful if an establishment is actually able to change its production technique following a change in factor prices. Thus the case study investigates whether establishments are aware of alternative production techniques that use a different combination of labour and capital. Establishments are also asked the reason for choosing the present one in order to shed some light on their response to changes in factor price.

Establishments characteristics, viability and willingness in substituting factors of production will together give an overall picture of EOEs and DOEs employment generation capabilities.

The establishments surveyed are grouped into EOEs or DOEs. For each of these two groups we will compare:

- Type of ownership, size of establishment, location and type of products.
- Capacity utilisation, technology and auxiliary establishment relationship.
- Factor intensity and productivity.
- Wages and skill.
- Incentives received.

6.4 Characteristics and Performance of Export–oriented and Domestic–oriented Establishments

The discussion in this section will be divided into three parts ;

- Basic characteristics
- Employment , capital and output
- Capacity utilisation , technology and auxiliary relationships.

6.4.1 Basic Characteristics

The EOEs have different characteristics from DOEs as shown in table 6.3. The difference in the types of product manufactured by EOEs and DOEs confirms generally the classification made in chapter 5. EOEs mainly produce electronic components. However, it is seen that three establishments producing consumer products and which should be in the DOE group, possess EOE criteria (exporting more than 50 per cent of their products). Out of the total of eight DOEs surveyed, five produce consumer products, one produces industrial and communication equipment (switchboards) and two produce electrical cables.

All EOEs are located in Free Trade Zones (FTZ) or hold Licensed Manufacturing Warehouse (LMW) status. FTZ and LMW have the necessary infrastructure (roads, power, water and communications), low land rental rates and most important of all exemption from import duties and sales tax for input material and from export and excise duties for export production.

Table 6.3

Basic Characteristics of Export–oriented and Domestic-oriented Electrical/ Electronic Establishments

	Year of establish-ment	Is it an off-shore facility	Location	Ownership 1979(%) Local	Ownership 1979(%) Foreign	Ownership 1985(%) Local	Ownership 1985(%) Foreign	Type of product
Export-oriented								
1	1972	Yes	FTZ	-	100	-	100	capacitors, communication equipments
2	1972	Yes	FTZ	-	100	-	100	semiconductors, components
3	1972	Yes	FTZ	-	100	-	100	semiconductors, components
4	1972	Yes	IE	100	-	-	100	parts for radios & cassette players
5	1973	Yes	FTZ	6	94	20	80	airconditioners
11	1976	Yes	LMW	20	80	20	80	radios,cassettes & stereos
Domestic-oriented								
6	1977	No	IE	100	-	90	10	televisions
7	1967	Yes	IE	39	61	39	61	televisions
8	1975	No	IE	100	-	70	30	fans
9	1967	Yes	IE	33	67	70	30	radios,televisions,stereos
10	1968	No	IE	50	50	100	-	fridges,air conditioners
12	1969	No	IE	100	-	100	-	switchboards
13	1968	No	IE	93	7	100	-	cables
14	1969	No	IE	60	40	NA	NA	cables

Note: FTZ = Free Trade Zone
IE = Industrial Estate
LMW = Licensed Manufacturing Warehouse
NA = Not Available

The DOEs are all located at industrial estates designated by government and provided with infrastructure and enjoying low land rental rates. Thus the EOEs have an advantage over DOEs in respect of import and export duties and sales tax. Local costs and facilities are approximately the same.

Foreign ownership is very much in evidence in the EOEs. The electronic component EOEs are fully foreign owned and this ownership pattern remains unchanged throughout the 1979–1985 period. Some of the electric consumer EOEs have some local ownership but where it occurs it is only a small percentage. The exception to this is establishment no. 4 which was 100 per cent locally owned in 1979 and became completely foreign (Singapore) owned in 1985. The dominant foreign ownership of these establishments thus has become stronger. In 1985 all the EOEs are off-shore facilities[2] (subsidiaries) of foreign companies.

The DOEs, on the other hand, are mainly Malaysian owned. Exceptions are two DOEs which are subsidiaries of foreign companies.

These basic characteristics reveal a dualism in the electrical and electronic industry in Malaysia. EOEs are very different from DOEs in terms of product , location, ownership and status .

6.4.2 Employment, Capital and Output

6.4.2.1 Employment

Employment size in EOEs is very different from that of DOEs (table 6.4). EOEs employ large numbers of workers; in 1979 all the EOEs surveyed had more than 250 employees and 67 per cent of them more than 500 employees. By contrast all DOEs had less than 500 employees in 1979. The average employment size of EOEs in 1979 is 1085 workers; about five times greater than DOEs (228).

This employment size differential between EOEs and DOEs follows, but does not necessarily prove the common perception that EOEs, especially in the electronics sector are set up in LDCs to make use of cheap labour. Another factor, however, could be that the minimum size of an economically viable electronic plant is larger than for other electrical manufacture. Whatever the reason, looking at employment size alone, EOEs create more employment.

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[2] Offshore facilities are subsidiaries of foreign-owned (parent) companies which are established to manufacture products for sale by the parent company or to provide components or parts to the home country plant .

Table 6.4

Size of Establishments According to Capital and Employment

Employment size (No. of persons)	1979 EOE	1979 DOE	1985 EOE	1985 DOE
Over 2000	1	-	2	-
1000 - <2000	2	-	1	-
500 - <1000	1	-	2	2
250 - < 500	2	3	1	-
0 - < 250	-	5	-	6
Total	6	8	6	8
Average employment size (No. of persons)	1085	228	1421	209

Capital size ($million)	1979 EOE	1979 DOE	1985 EOE	1985 DOE
Over 100	-	-	2	-
50 - <100	-	-	1	1
25 - < 50	1	-	1	2
5 - < 25	1	1	1	1
0 - < 5	2	6	1	4
Total no. of establishments	4[a]	7[b]	6	8
Average total capital size ($mil.)	12.67	2.52	58.51	18.63

Note: EOE = export-oriented establishments
DOE = domestic-oriented establishments
a = two establishments did not provide capital data
b = one establishment did not provide capital data

Establishment employment size follows the pattern of output performance quite closely. EOEs have a higher proportion increasing their employment than DOEs (table 6.4). The increase in employment among EOEs is also shown in table 6.4 when in 1985, 83 per cent of the establishments employ more than 500 workers as compared with 67 per cent in 1979. The pattern of employment size among the DOEs changes only slightly; in 1985 two establishments moved up into the 500 – 1000 category but there are also more establishments in the smallest employment category (0 – 250).

If the average employment criterion is used (as in table 6.5), DOEs perform much worse than EOEs. DOEs reduced average employment from 228 workers in 1979 to 209 in 1985. On the other hand, EOEs increased from 1085 to 1421 for the same period.

One observation is that a number of establishments in the EOE and DOE categories increase their output but simultaneously decrease their employment. This supports the supposition that labour productivity is increasing within existing plants, perhaps aided by additional equipment.

6.4.2.2 Capital

Two problems are encountered when making the comparison of capital size. The first and more important one is the familiar problem of using book value of fixed assets as the surrogate of capital value. Financial depreciation rates used in arriving at these book values may not bear a close or consistent relationship with the economic life of the equipment concerned.

The second problem is the failure of a few establishments to provide the necessary data, despite repeated requests. Since the sample was small, the omission of the data from a few respondents could cause a big change in the overall findings.

Be that as it may, the average capital size does show a difference; EOEs average capital size is five times bigger than that of DOEs in 1979 (table 6.4).

Both EOEs and DOEs increase their capital during the 1979–85 period. DOEs increase is twice that of EOEs. However, the question of whether the establishments are becoming more capital–intensive will be discussed later using the capital intensity criterion.

Table 6.5

Employment and Production Between 1979 -1985

	Employment (No. of persons)			Production ($ million)		
	1979	1985	% change	1979	1985	% change
Export-oriented establishments						
1	372	506	+36	14.6	28.6	+ 95
2	1191	2092	+75	41.3	89.7	+117
3	2105	3561	+69	156.6	446.5	+185
4	466	409	-12	3.8	3.0	- 21
5	865	805	- 6	98.0	120.0	+ 22
11	1509	1154	-23	70.0	96.3	+ 37
Average	1085	1421	+31	64.1	130.7	+103
Domestic-oriented establishments						
6	156	40	-74	28.6	4.8	- 83
7	307	231	-24	32.0	20.5	- 35
8	82	48	-41	2.1	3.3	+ 57
9	475	624	+31	40.0	63.9	+ 59
10	260	96	-63	19.9	4.8	- 75
12	48	27	-43	0.7	0.3	- 54
13	54	47	-12	3.1	2.9	- 6
14	440	558	+26	20.0	56.0	+180
Average	228	209	-8	18.3	19.6	+ 7

6.4.2.3 Output

Both EOEs and DOEs show mixed output performance during the 1979–1985 period (table 6.5). Eight out of fourteen increase their output. Nevertheless, EOEs perform better than DOEs; five out of six EOEs increase their production while only three out of eight of the DOEs achieve this.

The most obvious reason for lower output is the global economic recession which started in late 1984. This affected the Malaysian economy in the form of reduced export revenue (especially in the traditional sectors of primary commodities), the domestic economy contracted and with it, domestic demand for goods. The government's response to losses in terms of trade was to increase public saving and to cut investment. This resulted in a fall of demand stimulus. Hence, DOEs which produce consumer products were badly affected by the fall in domestic income in a way that the EOEs were not. This fall in demand has a big effect on many of the performance indicators of DOEs , as will be pointed out in this discussion.

A closer look at the output performance of EOEs reveals a performance difference between (i) component and (ii) consumer products establishments. During the period 1979–1985 component producers (establishments no. 1, 2 and 3) show large increases in output (minimum rate of 95 per cent) but consumer product companies only register small increases (and one establishment even reduces output). Perhaps this shows that electronic components establishments which make intermediate products can withstand economic fluctuations better than those making final products.

In terms of annual growth rates, the EOE rate of 12.6 per cent per annum nearly equals that of the manufacturing sector (14.2 per cent per annum)[3]. DOE growth is very small; that is 1.1 per cent per annum.

Subsidiaries of multinationals are usually helped by the parent and other sister companies in times of fluctuating demand. Many subsidiaries operate in effect, as subcontractors for the parent and thus the minimum output level is assured. The marketing network of multinationals ensures that EOEs do not have to depend only on a single market. By contrast DOEs are restricted to the Malaysian domestic economy.

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[3] Calculation of manufacturing gross domestic production annual growth rates is based on data in "The Economic Report" 1981/82 and 1988/89, Ministry of Finance,Government of Malaysia.

Linking output, employment and capital, we check whether the observed change in output requires the same size increase in employment and capital.

Table 6.6

Changes in Output, Employment and Capital in Electrical andElectronic Establishments, 1979–1985.

	% of change *	
	EOE	DOE
Output	103	7
Employment	31	-8
Capital	362	639

Note: * = These changes are obtained by using average value figures.

Table 6.6 shows that EOE output increase is accompanied by an increase in capital which is much higher than that of labour. However for DOE, increased output actually required less labour but a massive increase in capital.

In comparing viability (measured by output performance) EOE is better than DOE. In terms of employment, EOE creates more opportunities than DOE, and is achieved by a lower increase in capital.

Therefore, if employment generation is one of the main aims of industrialisation, an export–oriented strategy should be pursued.

6.4.3 Technology, Capacity Utilisation and Auxiliary Establishment Relationship

6.4.3.1 Technology

The survey also asks respondents to estimate the level of technology used in the production process. The replies are, of necessity, subjective; the respondents stating how advanced their production process techniques are when compared with the "industry level".

Table 6.7 shows that 78.5 per cent of the respondents indicate that their production process uses medium level technology in 1985. This figure includes all the DOEs and half of the EOEs. The remaining EOEs use advanced level technology. Information on level of production technology is disaggregated into :

Table 6.7

Level of Technology in 1985

Present level of technology	Establishments	%
Advanced	3, 5, 11	21
Medium	1, 2, 4, 6, 7, 8, 9, 10, 12, 13, 14	79
Low	None	

Level of production process that used the most advanced technology

	EOE						DOE							
Establishments	1	2	3	4	5	11	6	7	8	9	10	12	13	14
Process I (upstream process)	-	Y	Y	NA	Y	Y	-	-	Y	Y	NA	NA	Y	Y
Process II (middle process)	-	-	Y	NA	Y	-	-	Y	-	Y	NA	NA	-	Y
Process III (downstream process)	Y	-	Y	NA	Y	-	Y	-	-	-	NA	NA	Y	Y

	EOE %	DOE %
Upstream	4/5=80	4/6=66.6
Middle	2/5=40	3/6=50
Downstream	3/5=60	3/6=50

Note; NA = Not Available
Y = Yes
EOE = export-oriented establishments
DOE = domestic-oriented establishments

(i) beginning process or upstream process

(ii) middle process

(iii) end process or downstream process.

Advanced processes are found more frequently at the upstream or beginning process for EOEs. Being subsidiaries of multinationals, EOEs probably have access to the production processes and techniques used in the home country of the parent companies. The level of EOE technology can also be linked to their large size which means the availability of large research and development expenditure. This will give rapid technological development and innovation. Therefore it is not surprising that 50 per cent of EOEs use advanced technology whereas none of the DOEs do.

The DOEs produce import–substituting products and these products could be considered as "the easy–stage of import substitution"; that is producing consumer goods. Products have not changed very much from the period when these establishments were established. Therefore their production technology is not new. There are many establishments making these products, competition is intense and technology is easily acquired.

Table 6.8

Reason for Choosing the Present Production Method

	Establishments		%
	EOE	DOE	
1) The cheapest production method	2, 5	6, 8, 9, 10, 12, 13, 14	69
2) Licensed by parent company	1	7	15
3) It does not use too many workers		14	8
4) Availability of cheap labour	4		8
			100

Note : Establishment no. 3 did not respond to this question .

The response is very poor for questions concerning establishments awareness of other production techniques that use different proportions of capital and labour.

The answers given for choice of present production method do not show any difference between EOEs and DOEs (table 6.8). Reasons given by both EOEs and DOEs support the view that production technique is determined by factor of production prices.

6.4.3.2. Capacity Utilisation

The capacity utilisation of establishments surveyed is determined by four criteria, as shown in table 6.9 :

Table 6.9
Capacity Utilisation

Establishments	No. of working days		Subjective rate of utilisation (%)		Optimum utilisation		Average hours worked per day	
	1979	1985	1979	1985	1979	1985	1979	1985
Export-oriented								
1	302	241	85	75	No	No	8	7.2
2	NA	244	NA	NA	NA	No	NA	24[a]
3	345	301	75	NA	No	NA	16[b]	8
4	335	301	90	70	No	No	14[b]	8
5	268	240	100	95	Yes	No	8	9
11	300	301	100	100	Yes	Yes	8	8
Average	310	271	90	85				
Domestic-oriented								
6	340	149	70	30	No	No	8	8
7	245	206	95	NA	No	NA	9	6
8	255	345	80	70	No	No	10	8
9	NA	240	80	80	NA	No	8	9
10	236	235	65	70	No	No	8	9
12	233	295	78	70	No	No	8	7.5
13	292	293	80	75	No	No	24[a]	15[b]
14	345	289	100	50	Yes	No	24[a]	16[b]
Average	278	256.5	81	63.6				
Total average	291	262.5	84.5	71.3				

Note: a = 3 shifts b = 2 shifts NA = Not Available

(i) Number of days worked.

(ii) Number of hours worked per day.

(iii) Subjective capacity utilisation rate.

(iv) Whether at optimum utilisation.

Both DOEs and EOEs are generally under–utilised in 1985 using the first criterion. Establishments register fewer working days in 1985 when compared with 1979. Average total working days in 1979 is 291 days while that of 1985 is 262.5.

The second criterion also shows a reduction in capacity utilisation. Most establishments worked the normal 8 hours in 1985 with the exception of a few which worked 2 or 3 shifts. In 1979 there were more establishments working longer than 8 hours. There is a difference in capacity utilisation between EOEs and DOEs. Utilisation is greater in EOEs, according to the number of working days. On average EOEs worked 310 and 278 days for 1979 and 1985 respectively. DOEs only worked 271 and 256.5 days during the same periods.

Even though this study uses a small sample its findings concur with Hoffman and Tan[4] (whose study covered all manufacturing industries) and with Cheong[5] (whose sample covered almost all the establishments in the industries chosen).

The third criterion, subjective capacity utilisation, was chosen as an alternative measure in order to take into account non–measurable factors of utilisation. For example, the first two measures quantify the running time

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[4] Hoffman, L and Tan, S. E., 1980. Industrial Growth, Employment and Foreign Investment in Peninsular Malaysia, Kuala Lumpur, Oxford University Press; they found large establishments have higher capacity utilisation than small ones (page 127).

[5] Cheong (1981), op.cit. found capacity utilisation was different between EOEs and DOEs (page 70).

but do not, for instance, measure the running intensity. Thus the subjective measure gives the perception of how fully utilised was the production capacity. The subjective measure confirms the findings of the first two criteria that in 1985 some establishments had reduced their production capacity.

The lower capacity utilisation in 1985 compared with 1979 can be linked directly to output performance. In table 6.10, 73 per cent of the establishments cite fluctuation of demand as the main reason for non–optimal capacity utilisation. This contrasts with the reasons given in 1979, which are evenly distributed among various factors such as maintenance of machinery, fluctuation of demand, stiff competition from other products, bottleneck at parent plant and change in production requirements.

Table 6.10

Reasons for the Non-optimal Capacity Utilisation

	1979		1985	
	No. of establishments	%	No. of establishments	%
1) Shortage of Labour	1	10	1	9
2) Frequent maintenance of machinery	2	20	-	-
3) Fluctuation of demand	3	30	8	73
4) Market too competitive	2	20	-	-
5) Bottleneck at parent plant	1	10	-	-
6) Change in production requirement	1	10	-	-
7) Low productivity	-	-	1	9
8) Lack of quality control	-	-	1	9
Total establishments responding	10	100	11	100

6.4.3.3. Auxiliary Establishment Relationship

Industrial development strategy should be a strategy to not only encourage new industries but also encourage industries to develop strong links to other establishments or sectors. The relationship between EOEs/DOEs and their suppliers and customers is given at table 6.11. The connection with domestic suppliers is called backward linkage; the connection with domestic customers is called forward linkages.

All the EOEs are set up in locations with special attractions; of which an important one is duty–free imported input materials. EOEs also export almost all of their products.

The government policy to promote industrialisation, in particular an export–oriented one, has produced negligible backward linkages. The EOEs are mostly located in the Free Trade Zones where imported inputs are exempted from duty. Hence, there is no incentive for local manufacturers to be input suppliers to these establishments as they probably cannot compete on cost and quality. There is also provision for DOEs to have duty–free input if local quality and price is not at par with imported one.

The absence of forward linkages is due to the nature of the products. DOEs mainly produce final or consumer goods. EOEs, which are subsidiaries of companies in developed countries, produce intermediate goods meant for final processing elsewhere. Therefore, EOEs export all of their products. Although in table 6.11, three out of four of these companies indicate that their products are used by other manufacturers, one must bear in mind that these manufacturers are foreign ones.

EOEs have minimal backward linkage; 60 per cent of them hardly have any local input (table 6.11). The inputs for EOEs are mainly from foreign suppliers. Input materials are imported because they are not available locally (table 6.12) and even if they are, the imported inputs are cheaper than the domestic ones. On the other hand, DOEs show a more balanced distribution of local and foreign sources of inputs(see table 6.11). Neither type of establishment shows any forward linkage effect.

In summary, EOEs have no linkage with the domestic economy while DOEs have only weak backward linkage. If this backward linkage is to grow,

Table 6.11

Auxiliary Relationship of Electrical and Electronic Establishments in 1985

	Proportion of components used * that are manufactured outside the establishment		Whether product is used in manufacture of other goods
	Malaysian components	Foreign components	
	%	%	
Export-oriented establishment			
1	1	99	Yes
2	-	100	NA
3	NA	NA	NA
4	-	100	Yes
5	100	100	Yes
11	40	60	No
Domestic-oriented establishment			
6	90	10	No
7	100	100	No
8	70	30	No
9	50	50	No
10	65	35	No
12	3	10	No
13	89	11	No
14	-	-	Yes

Note: *: The figures in each row need not necessarily add up to 100 per cent. They are separate percentages, for example an establishment may have all its Malaysian components produced outside the establishment or, on the other hand only a small is produced. The same applies to the foreign components; some establishments may have components from sister/parent companies and thus the percentage of components produced outside the establishment is less than 100%.

NA = Not available

domestic suppliers must be able to match the quality and price of imports , as highlighted by the responses summarised in table 6.12.

Table 6.12

Reason for Importing Input Materials

Reason	% of establishments First	Second	Third
1) Unavailable locally	83	–	50
2) Cheaper than local components	17	33	50
3) Local components are of inferior quality	–	67	–
Total	100	100	100

6.5 Factors of Production

We begin by analysing the intensity and productivity of all factors and then in more detail discuss the labour factor, its composition, the demand for skilled labour and how this has changed.

6.5.1 Factor Intensity and Productivity

Table 6.13 calculates the usual labour/capital/output ratios. In order to provide a second perspective on these important responses, the calculations were done twice. First the ratios were computed for each establishment individually, and the ratios then averaged. Second, the weighted average for each group was calculated, by first totalling the values in each group, and then making the division to obtain the overall ratio. In most cases the results of the two methods are not too different. In the following discussion, the average of ratios is used unless stated otherwise.

6.5.1.1. Capital Intensity

Capacity intensity is represented by capital–labour ratio in table 6.13. DOEs are more capital–intensive than EOEs in 1985 while in 1979 capital–labour ratio for DOEs is smaller. Both types of establishments became more capital–intensive in 1985 as compared to 1979. These findings are confirmed by the second measurement – the weighted average.

DOE production processes appear to be more capital–intensive (in 1985) than EOEs, but we do not believe that it is caused by DOE production processes becoming themselves more advanced; instead we are probably seeing the

Table 6.13

Factor Intensity and Productivity

	Capital/ Labour $ '000		Output/ Labour $ '000		Output/ Capital	
	1979	1985	1979	1985	1979	1985
Individual establishments						
Export-oriented						
1	7.6	14.7	40.0	55.5	5.2	3.8
2	-	26.7	34.4	43.4	-	1.6
3	-	39.3	76.9	125.0	-	3.2
4	3.1	2.8	8.1	7.3	2.6	2.6
5	44.9	150.3	111.1	142.8	2.5	0.9
11	4.9	22.1	45.4	83.3	9.3	3.8
Average	15.1	42.6	52.7	76.2	4.9	2.8
Domestic-oriented						
6	15.1	76.4	200.0	125.0	12.2	1.6
7	24.5	150.5	111.1	90.0	4.3	0.6
8	3.4	2.2	25.6	66.6	7.5	31.1
9	-	87.1	83.3	111.1	-	1.2
10	10.8	125.6	76.9	50.0	7.1	0.4
12	12.4	10.8	14.4	11.9	1.2	1.1
13	3.4	4.8	58.8	62.5	16.8	12.8
14	8.9	79.2	45.5	111.1	5.1	1.3
Average	11.2	67.1	76.9	78.6	7.7	6.3
Weighted average						
EOE	7.79	41.17	59.2	91.7	7.6	2.2
DOE	9.70	89.17	80.6	93.5	8.3	1.1

consequences of the fall in domestic demand, increasing the proportion of the fixed asset cost in the production process.

This effect hits all DOEs. The biggest increase in the capital–labour ratio for the individual EOEs between 1979 and 1985 is 4.5 (see item 11, 22.1/ 4.9) , but this ratio is comfortably exceeded by no less than four of the DOEs out of the sample of eight .

Naturally the root of increased capital intensity can be traced to the changes in each component – labour and capital. Looking back at table 6.6 , EOEs on average increase their employment by 31 per cent whereas DOEs decrease by 7 per cent. Increase in capital by EOEs was 361 per cent and DOEs was 640 per cent. The fall in manpower in DOEs can be caused by either (i) great investment in labour saving machinery , with steady or increased production, or by (ii) reduced demand for products .

By reference to table 6.6, the DOEs production can be seen to have hardly increased in nominal Ringgit value and undoubtedly fallen in real terms. Furthermore, table 6.9 shows that capacity utilisation dropped in 1985 suggesting that demand for products has reduced. Thus, the latter of the two explanations above is favoured .

6.5.1.2. Labour Productivity

Labour productivity is measured by the output–labour ratio. After being less productive in 1979, EOEs labour productivity reaches that of DOEs in 1985.

This is consistent with the pattern of wage increase in section 6.5.3; to remain competitive EOEs have to keep production cost low. One way is to increase labour productivity. Constant productivity showed that the pressure to remain competitive is not that great for DOEs.

6.5.1.3. Capital Productivity

DOEs used their capital more productively than the EOEs (output/capital column, of table 6.13). Although capital usage has increased, its productivity declined during the 1979 to 1985 period. This decline was experienced by both the EOEs and DOEs. However, DOEs still maintain a higher capital productivity compared to EOEs in 1985.

It still remains to be explained why DOE capital costs rose so much , in the face of falling demand. The most plausible explanation may be a combination of :

- Acquisitions, at new inflated price levels, being added to older assets acquired at relatively low price levels
- Lag time in respect of capital projects . In the early 1980s growth expectation was very high, and investment plans made and equipment orders placed at that time would be difficult to cancel or postpone

Summary of Factors of Productions Indicators

In summary, the three indicators in table 6.13 suggests a few salient points:

- No clear conclusion can be made about labour absorption based on capital intensity. Although DOEs capital intensity is smaller in 1979, the tremendous increase recorded in 1985 made it almost double that of EOEs.
- The EOE has become more capital– intensive in 1985, when compared with 1979. Increasing wage levels may be one cause of reduction in labour usage and rise in capital intensity. The type of equipment used in production processes may be another one. Initially production processes use relatively inexpensive and unsophisticated equipment.

High labour cost in USA, Europe and Japan has resulted in more advanced manufacturing processes being transferred from their birth places to LDCs.

- Capital intensity increment is not matched by capital productivity. By 1985, the EOEs capital intensity has increased by a factor of two or more; over $ 40,000 is invested for employee. DOEs capital intensity is about $ 60,000 per employee. For both EOEs and DOEs, capital productivity declined in 1985. This means that the increase in capital is not matched by output. The reason for DOEs performance is probably the slump in demand thus giving the false impression of an increase in capital intensity; in fact the increased capital is actually idle capital.
- Possibly DOEs are more productive users of labour; their output–labour ratio is better than for EOEs (78.6 versus 76.2, in 1985, average of individual establishments). The weighted average measure also supports this, giving averages of 93.5 (DOEs) and 91.7 (EOEs). If the DOEs are shown to be more productive users of labour, this is a very important finding. If labour in Malaysia becomes more expensive than in other developing countries, industries with high labour productivity will become more important.
- Linking these indicators with establishment size, there is no obvious or direct relationship between a large establishment, high capital intensity and high productivity. This is proved by DOEs which are generally small but have high capital intensity and productivity.

6.5.2 Composition of Workforce

Although the three factor substitution estimates have shown that skill is not a separate factor of production (section 5.5), it is necessary to confirm this finding at the establishment level. Thus, the composition of the workforce is analysed to indicate changes in the proportion of skilled workers. One area of the survey which needs special attention is the definition of skilled and unskilled workers. Most respondents use subjective criteria, namely their perception of how skilled their workers are. Thus the criteria vary from one respondent to another. To standardise, findings from other studies[6] will be considered.

Production workers mainly consist of :

(i) School leavers with general school certificate (equivalent to British 0–level certificate).

(ii) Those who have nine years of education, and who left school at 15 years old with a lower school secondary certificate.

(iii) Those with only primary school education, having left school at the age of 12 years.

These three types of school leavers are without any specific skill as manufacturing workers and only gain experience and skill through their work. For this study the definition of skill will be the qualifications at the first point of job entry. Since production workers start work as school leavers, they will be considered as unskilled workers.

There is little difference in the composition of skilled and unskilled workers in EOEs and DOEs between 1979 and 1985 (table 6.14). 78 per cent of the workforce is unskilled in 1979. In 1985 , this proportion is about 70 per cent. This observation about the unchanged proportion of skilled workers agrees with that of three factor substitution.

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[6] Such studies are:

Pang, E.F. and Tan, A.H.H., 1980. " Production and Employment in the Electronics Industry In Singapore". Paper presented at the Seminar on ASEAN Comparative Study of the Development of Labour Intensive Industry, Pattaya.

Helleiner, G.K., 1976. "Industry Characteristics and Competitiveness of Manufactures from Less-Developed Countries" Weltwirtschaftliches Archiv, Band 112, Helt 3.

The proportions of skilled and unskilled workers are supported by table 6.15 which shows the composition of the workforce according to qualification. The sum of items (3) and (4) in table 6.15 exceeds the percentage of unskilled workers in table 6.14. The reason is probably that some SPM/SRP/primary school graduates are included in the class of clerical and manual workers, not in production workers.

Table 6.14

Composition of Skilled and Unskilled Workers for 1979 and 1985

	Unskilled workers (%)		Skilled workers (%)	
	1979	1985	1979	1985
Export-oriented establishment				
1	69.6	64.4	30.4	35.6
2	77.1	74.5	22.9	25.5
3	83.5	64.4	16.5	35.4
4	86.2	86.3	13.8	13.7
5	71.7	60.0	28.3	40.0
11	80.6	72.7	19.4	27.3
Average	78.1	70.4	21.9	29.6
Domestic-oriented establishment				
6	71.2	60.0	28.8	40.0
7	70.7	50.6	29.3	49.4
8	79.2	79.2	20.8	20.8
9	84.2	63.5	15.8	36.5
10	66.9	73.9	33.1	26.1
12	87.5	88.5	12.5	11.5
13	72.2	61.7	27.8	38.3
14	90.9	74.4	9.1	25.6
Average	77.8	68.9	22.2	31.1

Table 6.15

Qualifications of Employees in the Electrical and Electronics Establishments, 1985

Qualifications	% of employees EOE	DOE
1) University, professional or college	6.3	6.9
2) STP[a]	2.0	1.8
3) SPM[b]	31.2	23.4
4) SRP[c] or primary education	60.5	65.2

Note: a : STP is equivalent to A–level School Certificate.
b : SPM is equivalent to O–level School Certificate.
c : SRP is Lower School Certificate which is given by examination when students have done 9 years of schooling.
EOE = export–oriented establishments.
DOE = domestic–oriented establishments.

6.5.3 Wages

The survey data on salaries, needed for a wage rate calculation is incomplete. Understandably, establishments were reluctant to give total salary data by occupation groupings despite the writer's pledge of confidentiality. Therefore, two supplementary indirect questions were asked in order to give some indication of wage increases. The first question covers starting salaries and the second asks for the perception of wage increase. Table 6.16 summarises the answers to the second question.

The answers to the first question are summarised at table 6.17. The breakdown of wage increase by occupational category helps to show which category received the highest wage increase. Every occupational category in both DOEs and EOEs has increased the starting salary with the exception of the DOEs management group. Mazumdar shows that the Malaysian labour

Table 6.16

Wage Increase in Electrical and Electronics Establishments Between 1979 and 1985

Rate of increase	% of establishments EOE	DOE
Between 11%-15%	17	37
More than 16%	83	63
Total	100	100

Note: EOE = export–oriented establishments
DOE = domestic–oriented establishments

Table 6.17

Starting Monthly Wage Rates of Occupational Categories in Electrical and Electronics Establishments

Occupational category	Mean value ($) EOE 1979	EOE 1985	% change	DOE 1979	DOE 1985	% change
Management	1080	1775	+ 64	2014	1640	–18
Professional	1110	1260	+ 13	1400	1508	+ 7
Technical	306	464	+ 51	381	725	+90
Supervisor	289	657	+127	579	718	+24
Clerical	223	330	+ 47	276	405	+46
Manual service	194	248	+ 27	173	283	+63
Production worker	144	248	+ 72	155	309	+99

Note: EOE = export–oriented establishments
DOE = domestic–oriented establishments

market is not responsive to market forces[7]. Thus, during recessionary period (1984/85) wages did not fall. Instead, the response was in the form of retrenchment among workers at the bottom end of the wage ladder. However, the pay for workers still in employment continued to rise.

Another factor that maintained the upward wage trend is the nature of wage settlement. Establishments enter into collective bargaining with workers where the wage rates will be determined for the next 2 to 3 years regardless of establishment performance.

Therefore, wages continue to rise even though the employers are facing reduced sales. However, DOEs management groups gave in to the recessionary pressure; the reduced starting salary may be due to bonuses and prequisites being cut.

The EOE supervisory category has the largest salary increment (127 per cent) while among the DOEs production workers receive the highest increase (99 per cent). The former increase is in line with the trend of EOEs being more capital–intensive , with more emphasis being given to skill. Even though DOEs do not follow the same pattern of salary increase as EOEs , the emphasis on skill can still be seen because the technical category receives the second highest salary increase.

Both EOEs and DOEs awarded large starting salary increases for production workers; 72 per cent and 99 per cent respectively. Wages continue to rise even though the economy entered a recession. It was also shown that the Malaysian labour market is segmented and certain sectors are not responsive to market forces. To make things worse, the wage increase in accompanied by

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[7] Mazumdar, D., 1989. "Labour Markets in Structural Adjustments in Malaysia", Economic Planning Unit, Human Resource Development Project, mimeo, page 19.

the appreciation of the Ringgit and not matched by productivity. Thus, Malaysia might be considered as moving out of the group of LDCs (Indonesia, Thailand and The Philippines) that offer cheap labour and are so attractive to foreign investments. Perhaps it is becoming more like countries such as Singapore and Taiwan where high salaries are compensated by high productivity.

6.5.3.1. Factors Affecting Wages

Companies were asked to state the factors (in order of ranking) that influenced salary increase (table 6.18). The most important factors for EOEs are:

(i) Wage level of other companies in the same industry.
(ii) Wage level of the manufacturing sector.
(iii) Productivity.
(iv) Trade union.

Table 6.18

Factors Affecting Wages in the Electrical and Electronics Establishments in 1979 and 1985

	1979(no.of establishments)				1985(no.of establishments)			
	Rank 1 [a]		Rank 2		Rank 1		Rank 2	
	EOE	DOE	EOE	DOE	EOE	DOE	EOE	DOE
1) Wage level of other establishments in the same industry	5	1	-	1	3	3	2	1
2) Wage level of the manufacturing sector	1	1	3	2	-	1	2	-
3) Productivity	-	3	-	2	2	1	1	-
4) Wage guidelines of the Government	-	-	2	-	-	-	-	1
5) Trade unions	-	2	-	-	1	3	1	1
6) Cost of living	-	1	1	1	-	1	-	1

Note: a : Factors ranked as Rank 1 are considered the more inportant factors than those ranked as Rank 2
EOE = export-oriented establishments
DOE = domestic-oriented establishments

The order of factor importance is not so clear for DOEs as for EOEs. In fact nearly all factors are given a rank of 1 by at least one DOE (only the wages guide–line by the government is not given this ranking).

From the above analysis, two points arise. The first point is that although the wage level of other companies in the same industry is the most important factor, it does not necessarily mean that the labour market is competitive. Richardson and Soon[8] found that the electrical/electronic wage rate did not fall during the 1984/85 recession. What happened instead was retrenchment, and employment fell by about 25 per cent.

Because electrical, electronic workers are mainly female, it is thought to be quite easy for them to change jobs. They are, by and large, single, aged 16 to 24, in their first job and mostly Malay girls, from rural areas[9]. Skill is acquired by in–house training and thus jumping from one job to another is quite easy. Therefore, to retain workers, companies have to be aware of the market wage level.

The other finding is the higher demand for skilled labour in 1985, probably because establishments were becoming more capital–intensive. This scarcity was manifested by high wage increases.

6.6 Incentives

Governments offer incentives in order to encourage and protect an industry, in the belief that without these incentives the industry cannot compete effectively. Table 6.19 shows the incentives enjoyed by both EOEs and DOEs.

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[8] Richardson, R. and Soon, L.Y., 1989. Wage Trends and Structures in Malaysia, Government of Malaysia, Economic Planning Unit, unpublished report.

[9] World Bank, 1989. Malaysia: Matching Risks and Rewards in a Mixed Economy, Washington D.C.

Table 6.19

Incentives Received by Electrical and Electronic Establishments in 1979 and 1985

Incentive	Establishments			
	1979		1985	
	EOE	DOE	EOE	DOE
1) Pioneer status	1 , 2, 3 4 , 5 ,11	6 ,7 , 8 9 ,10 14	1 ,2 ,3 11	6 ,9 ,10
2) Investment tax credit	4 ,11	-	2	10
3) Labour utilisation relief	-	-	-	-
4) Export incentive	4	-	11	-
5) Locational incentive	-	-	-	-
6) Accelerated depreciation allowance	-	-	1	9 ,13 ,14
7) Tax exempted imports	-	-	1 ,4	7 ,9
8) Export tax exemption	-	-	1	9 ,13
9) Tariff protection	-	-	-	8

Were incentives received for producing for domestic market in 1985?

	Establishments
Yes	10
No	6 ,7 ,8 ,9 ,12 ,13 ,14

Note: EOE = export-oriented establishments
DOE = domestic-oriented establishments

In 1979, all EOEs (those producing components and consumer goods) held pioneer status. Most DOEs were also pioneers (six out of eight establishments).

The pioneer incentive seems to be the most popular because it offers local tax holidays and the ability to remit tax–spared dividends overseas where they could be free of tax in the hands of the parent company. Most incentives are available to all establishments with the exception of a few incentives such as tax exemption on imports. EOEs located in FTZ areas or with LMW status generally receive 100 per cent exemption while DOEs have to apply and if granted, the exemption is rarely a 100 per cent one. This observation is confirmed by the last two columns in table 6.20. Both types of industry import input materials but no EOEs pay import duties, while all the DOEs have to.

Table 6.20

Importance of Incentives to Electrical and Electronic Establishments

	Are incentives essential for the future of your establishment	Would your establishment respond to the govt. new export promotion incentives	Type of assistance required	Import input materials[a]	Paid import duties
Export-oriented establishment					
1	Yes	NA	PS	100%	No
2	Yes	NA	PS	NA	NA
3	NA	NA	-	Yes	No
4	Yes	No	PS,ITC	Yes	No
5	NA	NA	PS,EI,LF,ITC	30%	No
11	Yes	Yes	PS,LUR	Yes	No
Domestic-oriented establishment					
6	Yes	Yes	MA	Yes	Yes
7	Yes	NA	LF,TEI,reduction of excise duty	Yes	Yes
8	Yes	No	PS,ADA,reduction of sales tax	40%	Yes
9	Yes	No	PS,ITC	Yes	Yes
10	Yes	Yes	PS	Yes	Yes
12	Yes	Yes	PS	Yes	Yes
13	No	Yes	ADA.MA	8%	Yes
14	Yes	No	PS,LUR	Yes	Yes

Note: a : Some firms indicated the percentage of imported input material while others just indicated "Yes".

PS = pioneer status
TEI = tax exempted imports
LUR = labour utilisation relief
EI = export incentive
LF = locational factor
ADA = accelerated depreciation allowance
MA = marketing promotional assistance
ITC = investment tax credit
NA = not available

Even though table 6.19 shows that two DOEs receive import duty exemption, it is not full exemption, but only partial. EOEs receive full exemption.

In 1979, two other incentives were available to EOEs; investment tax credit and export incentives. (It is surprising that none of the EOEs received the labour utilisation relief incentive. EOEs which employ large numbers of workers should receive this. The explanation could be that the establishments did at one time receive the incentives but by the time the survey was carried out, the incentive period had expired).

The distribution of incentives in 1985 is different from 1979. Even though pioneer status was still the most popular incentive, there are fewer establishments receiving it because some establishments had come the end of the pioneer period (usually 5 or 10 years).

Those EOEs and DOEs that no longer enjoy pioneer status receive instead incentives such as accelerated depreciation allowance (ADA) , tax exempted inputs and tariff protection.

The number of EOEs stating that they had import duty exemption (two establishments) is misleading because no EOEs pay duty by virtue of their location in the FTZs. However, there are no similar incentives for DOEs producing import–substituting goods. The only assistance is tariff protection or import quotas.

This study is also interested in evaluating establishments' responses to new and future incentives. Only one indicated that it did not consider incentives essential (table 6.20). Recently the government introduced new incentives (1986) to promote export–oriented industries. The new incentives are not applicable to electronic component establishments because they already export all their products. Of the EOEs that sell some products to the domestic market, only one establishment (no. 11) expects to switch those products from the domestic market to the export market (provided the incentives are attractive enough).

The response among the DOEs is encouraging; 50 per cent of them indicate a willingness to change market orientation. Hence, new export incentives might be successful in attracting export–oriented companies to come to Malaysia but would only be partially effective with existing establishments. It is much more difficult for an existing establishment to change than for a newly set up one.

Establishments that regard incentives as essential to their future (ten out of the total fourteen), preferred the continuation of the pioneer status incentive. This may be because pioneer status incentive is given on the basis of capital investment only. Choice of product and market are not factors that were considered in granting the incentive. Hence, this incentive is less restrictive than those in the newly introduced Promotion of Investment Act.[11]

Other incentives preferred by the EOEs are investment tax allowances (ITA), export incentives, labour utilisation relief and locational incentives. DOEs are more concerned with reduction of various duties, accelerated depreciation allowances and assistance for exports, such as double deduction for promotional cost .

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[11] Detail discussion on various incentives offered by the government is done in chapter 3.

6.7 Summary of Electrical and Electronic Establishments Characteristics

There are more contrasting characteristics between EOEs and DOEs than similar ones. For example, one can easily recognise an EOE from a number of basic characteristics and conclude that the electrical and electronic industry comprises two distinct parts; EOEs and DOEs.

Shared characteristics

(a) Auxiliary relationship

Minimal backward linkage and no forward ones.

(b) Wages

The largest wage increases are found amongst production workers.

(c) Incentives

Beside pioneer status which is the most widely enjoyed incentive, both types of establishment were also granted others incentives.

Different characteristics

(a) Basic characteristics;

(i) Products – products of one type of establishment are almost completely different from the other; intermediate goods for EOEs and final goods for DOEs.

(ii) Location – EOEs are located at FTZs while DOEs are at industrial estates.

(iii) Ownership – EOEs are almost fully foreign–owned while DOEs are largely owned locally.

(iv) Status – due to the pattern of ownership, EOEs are subsidiaries while DOEs are not.

(b) Technology

EOEs technology is more advanced than DOEs

(c) Capacity utilisation

For both years (1979 and 1985) EOEs capacity utilisation was higher than DOEs. However, utilisation rates for both types of establishment were reduced in 1985 when compared to that of 1979.

(d) Employment

EOEs average employment size is bigger than DOEs.

(e) Capital

Although in 1979 EOEs average capital size was larger than DOEs, the increase in capital usage by DOEs has made the size of both types of establishments almost the same.

(f) Capital intensity

Capital–labour ratio, which is a measure of capital intensity does not show clearly which type of establishment that is more intensive. In 1979, it was the EOEs while in 1985 DOEs was more intensive. Both types of establishment increased their capital intensity during the 1979 to 1985 period.

(g) Capital productivity

DOEs use their capital more productively than EOEs.

(h) Labour productivity

DOEs' labour is more productive than EOEs'. However in 1985, labour productivity for both types of establishment became about the same.

(i) Unskilled workers

EOEs proportion of unskilled employees in the workforce in more than DOEs.

Performance and Changes (1979–1985)

	EOE	DOE
Output	103.9%	7.1%
Employment	30.9%	–8.3%
Capital	361.8%	639.3%

In terms of output, EOEs performed much better than DOEs although there was a global recession. DOEs confirm the usual view of import substitution establishments; low growth, capital–intensive and have lesser capacity to create employment

Employment Potential and Trend

Looking at the employment size alone, EOEs seem to have demonstrated employment creation potential. Their average employment size is five times of DOEs. Furthermore, during the 1979–1985 period, on average, EOEs increased their employment by 31 per cent while DOEs decreased by 8.3 per cent. 1985 was a time of global economic slow–down with reduced demand and this affected DOEs adversely. This pattern of increasing employment for EOEs and decreasing one for DOEs during the period 1979-85 is contrary to the findings of elasicity of substitution in the last chapter (see table 5.4). During this period EOEs elasticity remained unchanged while DOEs experienced a significant increase.

Employment size and demand indicators suggest that EOEs are better able to create employment even in unfavourable economic conditions, at least so far as LDCs are concerned. Indeed it could be said that EOEs in LDCs thrive on harsh global economic conditions. Companies with a choice of countries in which to produce will, when faced with falling profits , speed up their plans to utilise low cost areas, in order to protect profits. These transfers will, of course, be to the detriment of other higher cost countries' economies.

The EOEs characteristics fit the usually quoted picture of foreign–owned export–oriented establishments. These are foreign companies investing in an LDC, usually labour–intensive production but with advanced technology provided by the home country. Furthermore, EOEs markets are controlled by the parent companies. The DOEs also conform to the image of import–substituting industry; they are small in size, and make consumer products with a high capital–labour ratio.

An industrialisation strategy will only be successful if it encourages industries with growth potential. High growth will also create employment. EOEs have done well but they depend on their parent companies for their growth, coming as it often does from transfer of production. This production can also be moved out, so the government must ensure that foreign investors continue to find Malaysia a good site for manufacturing.

DOEs show more subdued growth because, being small , they have fewer economies of scale and less financial strength to absorb demand fluctuations. Thus, EOEs can generate more employment than DOEs based on growth potential as well as employment size and demand for labour.

CHAPTER 7

CASE STUDY OF THE TEXTILE INDUSTRY

7.1 Introduction

This chapter has two main parts:

(i) Study of textile industry characteristics

(ii) Summary of results found in the two case studies

Like electrical and electronic industry, textiles are one of the mainstays of the Malaysian manufacturing sector. They make an important contribution to output, value added, employment and exports. The industry started as domestic–oriented and later moved to exports.

Section 7.2 notes the characteristics and performance of establishments, followed by section 7.3, an analysis of the factors of production, composition of workforce and wages. Incentives are discussed in section 7.4.

The study finds difficulty in distinguishing EOEs from DOEs. In terms of basic characteristic, all establishments are very similar; overlapping products; varied location and no distinct foreign ownership. The other shared characteristics are: high capacity utilisation rate, minimal backward linkage, highest wage increase among production workers and pioneer status as the most widely used incentive.

In the way that they differ, textiles EOEs and DOEs are unlike the electrical/electronic industry. Textile EOEs are more capital–intensive than DOEs; have bigger average capital size, higher capital–labour ratio and use more advanced technology. DOEs, on the other hand, show signs of absorbing more labour; have bigger average employment size, a lower capital-labour ratio and a larger proportion of unskilled workers.

The productivity performance is rather mixed, with DOEs having higher capital productivity while the EOEs labour is more productive.

During the 1979–85 period, EOEs performed better than DOEs. They registered higher output growth, less employment reduction and also smaller rate of capital increment.

For the second part of this chapter (section 7.6), analyses from chapter 6 (electrical/electronic) and the first part of this chapter (textiles) are merged. Since electrical/electronic EOEs are quite different from DOEs but textiles do not show this so clearly, it is difficult to separate the EOEs characteristics from that of DOEs.

The different characteristics are (see table 7.19):

- EOEs capital size is larger than DOEs.
- EOEs level of technology is more advanced.
- DOEs capital productivity is higher.

The similar characteristics are (see table 7.20):

- There is some backward linkages but no forward ones.
- The largest wage increase is among production workers.
- Pioneer status is the most popular incentives.
- Both use the cheapest production technique.

Differences between industries are (see table 7.21):

Electrical/electronics	Textiles
• EOEs products are different from DOEs	Overlapping products.
• EOEs are located differently from DOEs	EOEs and DOEs are in similar location.
• EOEs are foreign owned while DOEs are local owned.	No distinct pattern of ownership.
• EOEs employment size is larger.	DOEs are larger.
• EOEs capacity utilisation rate is higher.	DOEs are higher.
• EOEs proportion of unskilled workers is higher.	DOEs are higher.
• It is unclear which establishment has higher capital intensity	EOEs are higher.
• DOEs have higher labour productivity.	EOEs are higher.

In terms of performance during the period 1979–85 (table 7.22), EOEs showed better results than DOEs. Their output is higher, employment reduction is smaller, and capital growth is slower. EOEs are better at employment creation than DOEs based on two out of three criteria. EOEs have better growth prospect and larger employment size.

7.2 Characteristics and Performance of Export–oriented and Domestic–oriented Textile Establishments

This section is divided into three parts :

- basic characteristics
- employment, capital and output
- capacity utilisation, technology and auxiliary relationships.

7.2.1 Basic Characteristics

The first basic characteristic is the type of products made. In chapter 5 for review of industrial level statistics, we identified the separate products and activities of EOEs and DOEs, as follows:

EOE	DOE
(1) Natural fibre spinning & weaving mills	(1) Dyeing, bleaching, printing and finishing
(2) Synthetic textile mills	(2) Batik making
(3) Knitting mills	(3) Manufacture of made–up textile
(4) Clothing	

This separation was difficult and two levels of verification were used for this purpose; the first one was based on a survey and the second was the classification used in the Malaysian Industrial Master Plan.

The same difficulty was again found in separating establishments. EOEs do produce synthetic textile, knitting and clothing products but spinning and weaving activities which perhaps should be classified as an EOE were found in the domestic market (in other words a DOE type).

In this case study DOE activities include spinning and weaving and manufacture of made–up textiles. Batik establishments were not included because the majority of those in the 1979 survey had since ceased trading. Since these establishments were small and had minimal capital, they were very quick to close if conditions were unfavourable. The remaining few batik establishments (from the 1979 survey) that were sent the questionnaire did not respond.

There are, however, activities that can be found in both EOEs and DOEs:

(i) Dyeing, bleaching, printing and finishing of yarns and fabrics.

(ii) Clothing (apparel).

Table 7.1

Basic Characteristics of Export-oriented and Domestic-oriented Textile Establishments

	Year of establishment	Is it an off-shore facility	Location	Ownership (%) 1979 Local	Ownership (%) 1979 Foreign	Ownership (%) 1985 Local	Ownership (%) 1985 Foreign	Type of Products
Export-oriented establishments								
1	1967	No	IE	60	40	52	48	Shirts,dresses,T-shirts,knitted apparel
2	1971	No	LMW	100	-	100	-	Shirts,blouses
3	1970	No	IA	52	48	53	47	Shirts,T-shirts,knitted apparel
4	1973	Yes	FTZ	-	100	-	100	Dyeing,bleaching,printing & finishing of yarn &fabric
5	1967	No	IA	90	10	100	-	Shirts, dresses,T-shirts
6	1974	Yes	FTZ	15	85	77	23	Man-made fibre,spinning
7	1973	Yes	FTZ	-	100	-	100	Manufacture of man-made fibre
Domestic-oriented establishments								
8	1972	No	IA	100	-	98	2	Fibre manufacturing, dyeing knitting& knitted apparel
9	1971	Yes	FTZ	10	90	90	10	Spinning,weaving
10	1973	Yes	FTZ	10	90	100	-	Spinning,weaving
11	1973	No	IE	78	22	51	49	Spinning
12	1965	Yes	IA	50	50	50	50	Spinning,weaving,dyeing ,blankets
13	1973	No	O	100	-	100	-	Weaving,dyeing,bleaching,towels
14	1976	No	IE	100	-	100	-	Babywear
15	1975	No	O	100	-	100	-	Shirts,T-shirts
16	1975	No	IA	100	-	92	8	Knitting,T-shirts

Note: IE = Industrial estate FTZ = Free Trade Zone O = Commercial area
LMW = Licensed manufacturing warehouse IA = Industrial area off industrial estate

Unlike the electrical and electronic industry, activities in textile EOEs and DOEs are not easily identified according to their market orientation. The difficulty in separating the products is due to the nature of textile activities. Many textile establishments have integrated processing. For example, if an establishment is a knitting or weaving mill, it will most likely be involved in dyeing, bleaching, printing and finishing.

The second basic characteristic is location. There is no significant difference between an EOEs and DOEs as 43 and 22 per cent are located in FTZ respectively. Those DOEs in a FTZ are part of an integrated group which consists of establishments no 4, 7, 9 and 10. In this group, establishment no. 7 manufactures man-made fibre, some of which are sold to establishments no 9 and 10, to be converted into yarn. The yarn is then sent to establishment no 4 for dyeing and finishing work. This constitutes the complete textile production process. Therefore, the DOEs located in FTZ do not strictly produce for the domestic market because their products will in the end be exported by establishment no. 4.

For the rest of the EOEs and DOEs, there is no difference in location, being all in industrial estates and industrial areas off industrial estates. The government provides infra-structure facilities and low rent at industrial estates. Industrial areas usually have fewer facilities than industrial estates.

Two of the DOEs are in areas not designated for industrial use. They are in commercial areas, which indicates that they started as small or secondary activities in a commercial enterprise.

The third characteristic is the type of ownership. This also follows the same pattern as the earlier ones, namely no great difference between EOEs and DOEs. 57 per cent of EOEs have majority local ownership while the percentage of DOEs is bigger (77 per cent, or 7 out of 9 establishments).

The other two DOEs which have majority foreign ownership (in 1979) are those that belong to the integrated textile group mentioned earlier.

There is no change over time in the pattern of ownership among establishments with a majority local equity. However, one EOE and two DOEs which had a majority foreign ownership in 1979, changed to a local majority in 1985. This may be due to the equity restructuring requirement of the government or just ordinary business decisions.

The last basic characteristic is the status of establishment. EOEs have more foreign ownership than DOEs. This is reflected in the percentage of establishments being subsidiaries; 43 per cent of EOEs are subsidiaries while only 33 per cent of DOEs are. The foreign investments are mainly from Japan, Taiwan and Hong Kong. The Japanese have invested in basic textile products which will be exported back to Japan for further processing.

In summary, there is no clear distinction in these basic characteristics between EOE and DOE and it is difficult to identify whether an establishment is a DOE or EOE by looking at any single characteristic.

7.2.2 Employment, Capital and Output: Size and Performance

7.2.2.1 Employment

Both EOEs and DOEs cover the smallest (0 – 250) to the biggest (over 2,000) category of employment size, with the majority in smaller establishments. In 1979, a higher percentage of EOEs (71 per cent) had less than 500 workers compared to 67 per cent of DOE.

Both EOEs and DOEs reduced their employment size in 1985 with the former smaller than the latter. This can be gauged by two measurements; employment size and average employment.

Table 7.2 shows that 4 out of 9 DOEs are in the range of (0 – 250) in 1979 and this becomes 6 out of 9 in 1985. For EOEs, six out of seven have employment below 1000 in 1979 but this becomes seven out of seven in 1985.

Looking at average employment, DOEs show the more marked contraction.

Table 7.2
Size of Establishments According to Capital and Employment

Employment Size (No. of person)	No. of Establishments 1979 EOE	1979 DOE	1985 EOE	1985 DOE
over 2000	-	1	-	1
1000 - < 2000	1	1	-	-
500 - < 1000	1	1	2	1
250 - < 500	3	2	3	1
0 - < 250	2	4	2	6
Total	7	9	7	9
Average Employment Size (persons)	493	626	399	452
Capital Size ($ million)	1979 EOE	1979 DOE	1985 EOE	1985 DOE
over 10	3	3	3	3
2 - < 10	-	-	3	1
1 - < 2	3	2	1	3
0.5 - < 1	-	1	-	-
0.25 - < 0.5	1	2	-	1
0 - < 0.25	-	1	-	1
Total	7	9	7	9
Average of Capital Size * ($ million)	26.970	9.393	36.668	15.188

Note: * = Median is used.

During 1979 – 85 period, EOEs reduce employment by 19 per cent (from 493 to 399) while DOEs fall by 28 per cent(from 626 to 452). The reason given by respondents is that recession had reduced demand.

DOEs have higher average employment than EOEs . However, this figure may be misleading because it is influenced by one large DOE in the sample. A different picture emerges if one looks at the employment median. In 1979, the median for EOE is 311 while for DOE is 286. In 1985, EOEs maintain almost the same employment median of 312 but DOE falls to 159(table 7.3).

7.2.2.2 Capital

EOEs capital size is much larger than DOEs(table 7.2). The first measurement, average capital size, shows that in 1979 EOEs average capital ($26.9 million) are three times larger than DOEs ($9.3 million). The second measurement, range of capital size, indicates that 86 per cent of EOEs have capital of more than $1 million while only 56 per cent of DOEs are of this size.

Table 7.2 also shows that capital size increases from 1979 to 1985 for both groups. When the average capital measurement is used, DOEs have a bigger increase than EOEs (61 per cent vis–a–vis 36 per cent). Like employment, a different picture is given by the range of capital size because the average capital size may be influenced by a single large establishment, while the second criterion looks at the change of capital for all the establishments. According to the second criterion, in 1979 43 per cent of EOEs have capital over $2 million but this becomes 86 per cent in 1985. For the DOEs, the figures are 33 per cent and 45 per cent.

7.2.2.3 Output

If EOEs are examined by type of production, the apparel establishments (1,2,3,5) do best, registering more than 100 per cent increase. These establishments are the most labour–intensive among EOEs if one looks at their capital–labour ratios(see table 7.11).

If DOEs are examined, the best performers are knitting and spinning and weaving establishments (8,10,11,14). These establishments' performance may be

Table 7.3

Employment and Production of Establishments between 1979 — 1985

	Employment (No. of Person) 1979	1985	% change	Production ($ million) 1979	1985	% change
Export-oriented establishments						
1	225	185	- 18	2.000	6.554	+228
2	311	249	- 20	2.000	4.500	+125
3	291	312	+ 7	5.858	15.707	+168
4	1398	756	- 46	147.502	165.000	+ 12
5	74	260	+251	1.015	3.512	+246
6	448	461	+ 3	17.446	25.151	+ 44
7	704	573	- 19	90.125	103.214	+ 15
Average	493	399	-19	37.992	46.234	+22
Domestic-oriented establishments						
8	77	66	- 14	1.200	2.536	+111
9	2818	2050	- 27	104.738	78.249	- 25
10	1227	903	- 26	22.198	54.046	+143
11	610	443	- 27	8.463	13.285	+ 57
12	286	159	- 44	3.312	3.378	+ 2
13	177	96	- 46	1.690	1.064	- 37
14	91	82	- 10	1.148	1.679	+ 46
15	47	48	+ 2	1.032	0.919	- 11
16	300	229	- 24	5.230	6.651	+ 27
Average	626	452	-28	16.556	17.978	+ 9

linked to those EOEs that did extremely well. Knitting and spinning and weaving are up–stream activities and their products are used for making apparel (for both EOEs and DOEs). Hence, if the demand for apparel is higher, then the spinning/ weaving and knitting activities will also benefit.

Average production has increased for both EOEs and DOEs during the 1979–85 period, although the effect is stronger in EOEs (22 per cent) than in DOEs

(9 per cent). All 7 EOEs in the sample increased their output whereas 2 of the 9 DOEs fell (table 7.3).

An interesting point here is that the increases occurred during a recessionary period. This is perhaps because textile goods are considered a basic necessity and therefore of low price elasticity. Thus even though incomes fall, demand does not. Also it is conceivable that EOEs perform better than DOEs because their market is larger.

The higher growth rate of EOEs widened the differential in output, so that as of 1985 the average output of EOEs is 2.7 times that of DOEs (in 1979 this difference is 2.3). Even though EOEs perform better that DOEs in terms of annual growth rate (4 per cent and 1.6 per cent respectively, for the period 1979–1985) their growth was very much lower than that of the manufacturing sector (14.2 per cent) [1].

Changes in output, employment and capital from 1979 to 1985 can be linked as follows:

	% of Change	
	EOE	DOE
Output	22	9
Employment	–19	–28
Capital	36	61

For both groups output growth is accompanied by more capital but less labour; with DOEs having higher increase in capital and bigger reductions in labour than EOEs. This indicates that the DOEs development is towards more capital intensity. Therefore, even though EOEs also reduce labour , their role in employment generation is more marked than DOEs.

[1] Calculated from figures given in the Economic Report 1978/79 and 1984/85, the Government of Malaysia, Ministry of Finance.

7.2.3 Technology, Capacity Utilisation and Auxiliary Establishment Relationship

7.2.3.1 Technology

Table 7.4 summaries the 1985 level of technology used in the production process; 67 per cent of EOEs used medium level technology and the rest used advanced. All of the DOEs used medium level technology.

Table 7.4

Level of Technology in 1985

Present level of technology	Establishments*	%
Advanced	3 4	14
Medium	1 2 5 7 9 10 11 12 13 14 15 16	86
Low	none	

Level of production process that used the most advanced technology:

Establishment	EOE 1	2	3	4	5	6	7	DOE 8	9	10	11	12	13	14	15	16
Process I (Upstream Process)	-	-	-	Y	Y	n.a	-	n.a	-	-	-	-	Y	-	Y	Y
Process II (Middle Process)	-	Y	Y	Y	Y	n.a	-	n.a	Y	-	-	-	Y	Y	Y	Y
Process III (Downstream Process)	-	-	-	Y	-	n.a	-	n.a	-	-	Y	-	Y	-	-	Y

Proportion that use advanced technology:

	EOE	DOE
Upstream	2/6 = 33%	3/8 = 38%
Middle	4/6 = 67%	5/8 = 63%
Downstream	1/6 = 16%	3/8 = 38%

Note:
Y = Yes
* = Establishments No. 6, 8 did not respond
n.a = Not available
EOE = Export-oriented establishments
DOE = Domestic-oriented establishments

The level of technology was linked to stages of the production process. Even though the overall level is medium, it is still useful to see which of the production stages used the most advanced technology within this medium level.

Table 7.5 shows the activities involved in each of the production stages and in each type of establishment.

Table 7.5
Level of Technology Used in Production Process

Upstream	Middle stream	Down stream
Spinning: Blowing & carding	drawing & roving (i.e. reducing strand size)*	spinning*
Apparel: cutting	sewing*	packing
Dyeing, bleaching & finishing: bleaching*	dyeing*	finishing*
Knitting: knitting of fabrics*	dyeing*	cutting & sewing

* Indicates a process using advanced technology.

All the middle stream production processes of each type of product use advanced technology. Apparel production, which produces final goods, has the least number of processes with advanced technology and it also is the most labour–intensive. For dyeing, bleaching and finishing all its production stages use advanced technology. The middle stream percentage is still the highest amongst all three production processes and are similar for EOEs as for DOEs (67 per cent and 63 per cent respectively).

Although most establishments regard some of their production processes as "advanced", this may not be the same as an "advanced" process in developed countries. Establishments in LDCs still want to utilise relatively cheap labour and therefore even its advanced technology is not at the level of Europe or Japan. In those countries the level of machine usage in production process is higher in order to minimise labour.

The level of technology used in Malaysia tends to rely on low–cost labour as shown by table 7.6 :

- 54 per cent of establishments choose the present method of production because it is the cheapest.
- Establishment no. 7 which manufactures man–made fibre uses technology which is not fully up–to–date because a new technology requires major capital investment.

Table 7.6

Reason for Choosing the Present Production Method

	Establishments*	%
(1) The only method available in Malaysia	4, 15	15
(2) The only method available in the world	13	8
(3) The cheapest method of production	1,2,3,5,10,14,16	54
(4) Licensed by parent company	9, 12	15
(5) Latest technology requires major new investments	7	8
		100

Note: * =Establishments. 6, 8, 11 did not respond

As was the case with electrical /electronic industry, questions on alternative production techniques had a very poor response.

4 out of 7 EOEs indicate that the reason they chose the present method of production was because it is the cheapest, as compared with 3 out of 9 DOEs. This is perhaps because EOEs need to compete in the world market and thus need to produce with the minimum cost. DOEs may be protected by tariffs and this

may explain why only 43 per cent chose "the cheapest method" reason.

7.2.3.2 Capacity Utilisation

Table 7.7 gives three measures of capacity utilisation:

(i) Numbers of days worked.

In 1979, both groups worked to almost full capacity (in the number of days) with the exception of Sundays and public holidays. On average an establishment worked 312 days in 1979. The decrease in the number of days worked from 1979 to 1985 for both EOEs and DOEs is in contrast to increased output in the same period. Labour law changes and less overtime may have reduced the number of days worked but productivity more than compensated for this and output rose.

Both in 1979 and 1985 the EOEs worked about 10 fewer days than DOEs. The increase in production noted earlier has thus been achieved with fewer employees and fewer days worked.

(ii) Number of hours worked per day

Most establishments' hours of work do not alter, but one EOE increased by 1.5 hours per day and three DOEs reduced by larger margins of 5, 8.5 and 8 hours per day. Only one of these three DOEs has reduced output while the other two show increases.

(iii) Subjective rate of Utilisation

Generally the responses to this question tally with those for the number of days worked. However, some establishments gave contradicting answers, as may be expected from the subjectiveness of the question.

Generally DOEs are more satisfied with their capacity utilisation than

Table 7.7 Capacity Utilisation								
	No. of working days		Subjective rate of utilisation(%)		Optimum utilisation		Average hours worked per day	
	1979	1985	1979	1985	1979	1985	1979	1985
Export-oriented Establishments								
1	285	296	80	90	No	No	8	8
2	305	299	80	90	No	No	8	8
3	300	303	90	90	No	No	8	9.5
4	300	245	76	70	No	Yes	8	8
5	295	289	n.a	100	No	Yes	8	8
6	300	n.a	100	100	Yes	Yes	24	24
7	365	365	100	100	Yes	Yes	24	24
Average	307	299	89	90				
Domestic-oriented establishments								
8	300	299	100	n.a	Yes	n.a	8	8
9	356	345	100	n.a	Yes	n.a	24	24
10	354	345	96	100	Yes	Yes	24	24
11	354	326	100	80	Yes	No	24	24
12	294	288	100	90	Yes	Yes	15	10
13	306	298	84	67	Yes	No	16	7.5
14	296	293	88	60	No	Yes	8	8
15	299	291	70	95	n.a	Yes	8	8
16	299	306	80	90	No	No	16	8
Average	316	310	91	83				

Note: n.a=Not available

Table 7.8 Reasons for the Non-Optimal Rate of Capacity Utilisation				
	1979		1985	
	Number of. Establishments	%	Number of Establishments	%
(1) Shortage of labour	1	17	3	43
(2) Fluctuation in demand	2	32	3	43
(3) Shortage of working material	1	17	1	14
(4) Quota restriction	1	17	-	-
(5) Competition from other establishments	1	17	-	-
	6	100	7	100

EOEs. Even working six days a week for eight hours is not the optimum utilisation for EOEs. This shows that if there is demand EOEs might achieve an even higher utilisation.

Table 7.8 shows that fluctuation in demand is the most important factor affecting utilisation. But shortage of labour is also very important. Labour will become increasingly important, because high economic growth means more industries are being set–up. Establishments in areas near established industrial centres (e.g Singapore) will have to compete for labour as higher wages and benefits are offered in nearby areas.

Furthermore, increase in wages among production workers will mean that it will be more difficult to get cheap labour. Many small textile establishments depend on such labour to remain competitive.

Establishments that cite fluctuation in demand as the factor that caused non–optimal utilisation are mainly EOEs. This indicates two things:

(i) EOEs are vulnerable to changes in overseas markets. These changes can be in the form of change in consumer taste/income or protectionist measures adopted by importing countries.

(ii) Excess capacity of EOEs cannot be diverted to the domestic market because this is saturated. Excess capacity increases production cost and affects EOEs competitiveness.

Quota restrictions are not at present a major problem. Malaysia's exports are well within the limit but further tightening up of trade agreements may see competition among establishments for export quotas.

7.2.3.3 Auxiliary Establishment Relationship

Backward linkage

EOEs have some backward linkage i.e. obtain some inputs from domestic suppliers (table 7.9). Nevertheless, EOEs still import a large percentage of their requirements. The DOEs degree of backward linkage is the same as EOEs'.

Table 7.9
Auxiliary Relationship of Textile Establishments in 1985

	Proportion of components used that is manufactured outisde the establishment (%)		Is own product used in manufacture of other goods
	Malaysian	Foreign	
Export-oriented establishments			
1	85	15	No
2	30	70	No
3	10	90	No
4	85	15	Yes
5	2	98	No
6	n.a	n.a	n.a
7	-	100	Yes
Domestic-oriented establishments			
8	n.a	n.a	n.a
9	20	80	Yes
10	10	90	Yes
11	-	100	Yes
12	-	100	No
13	100	100 *	No
14	n.a	n.a	No
15	n.s	n.a	n.a
16	85	15	Yes

Note: * The figures in each row need not necessarily add up to 100 per cent. They are separate percentages, for example an establishment may have all its Malaysian components produced outside the establishment or, on the other hand only a small is produced. The same applies to the foreign components; some establishments may have components from sister/parent companies and thus the percentage of components produced outside the establishment is less than 100%.

n.a = Not available

Table 7.10 Reason for Importing Input Materials			
Reason	% of establishments		
	First	Second	Third
(1) Unavailable locally	83	17	–
(2) Local components is of inferior quality	8.5	50	50
(3) Imports are cheaper than local components	8.5	33	50
Total	100	100	100

The lack of backward linkage is due to the availability, quality and price of local inputs. 83 per cent of responding establishments state that the input needed is not available locally or if it is, it is of inferior quality and/or more expensive.

Minimal backward linkage may in part be caused by the integrated nature of some textile production establishments which import raw material and produce finished products. Other input such as dye is usually not manufactured locally.

Forward Linkage

Four of the EOEs reported no forward linkage because they produce finished products, mostly for export. Two EOEs reported forward linkage but these are part of an integrated group and produced intermediate products used by other establishments in the group for eventual export. Thus, most EOEs have no forward linkage, the exception being those belonging to an integrated textile manufacturing group.

The DOEs can be divided into two groups; those making finished products and those making intermediate products. 43% of DOEs make finished products and there is no forward linkage for this group. Linkages do exist for intermediate goods. Establishments in this group are involved in spinning (producing fabric) and knitting (producing knitted fabric) activities.

The above observations show that DOEs have more linkage with the national economy than EOEs.

7.3 Factors of Production

This section looks at capital intensity and capital and labour productivities (table 7.11). There is also discussion of the type of labour used, in particular to find, within labour, the cause productivity (table 7.12) and wage movements (tables 7.14 and 7.15).

7.3.1 Factor Intensity and Productivity

7.3.1.1 Capital Intensity

Capital intensity as measured by the capital–labour ratio is shown in table 7.11. Both EOEs and DOEs have grown in capital intensity from 1978 to 1985. Using the unweighted average, the growth is a little more than double for DOEs (from $ 8,906 per worker to $ 18,977) and a little less than double for EOEs (from $ 35,269 per worker to $ 62,886).

Since the DOEs have the lower base, the almost equally large growth rates experienced by both groups, have the effect of increasing the gap in Ringgit terms between the two groups. Depending on the method used, in 1979, gaps were $26,000 (unweighted) and $40,000 (weighted). The gaps between EOEs and DOEs rise in 1985 to $44,000 (unweighted) and $58,000 (weighted). The wide spread of differentials is caused by two EOEs, with very high capital to labour ratio. They are nos. 4 and 7, which are engaged in (i) dyeing, bleaching, finishing of yarn and fabric and (ii) manufacture of man–made fibre respectively.

Table 7.11
Factor Intensity and Productivity

	Capital/Labour		Output/Labour $'000		Output/Capital	
	1979	1985	1979	1985	1979	1985
Export-oriented establishments						
1	5,178	9,789	8.889	35.425	1.716	3.618
2	5,103	16,981	6.431	18.072	1.260	1.064
3	4,670	8,171	20.130	50.342	4.311	6.161
4	47,952	132,486	111.111	218.253	2.200	1.647
5	3,518	7,719	13.720	13.506	3.899	1.754
6	37,739	53,167	38.941	54.556	1.032	1.026
7	142,727	211,891	125.000	166.667	0.897	0.850
Average	35,269	62,886	46.317	79.545	2.188	2.302
Domestic-oriented establishments						
8	10,519	18,296	15.584	38.428	1.481	2.100
9	15,798	46,100	37.167	38.170	2.352	0.828
10	20,339	13,701	18.091	59.851	0.889	4.368
11	17,845	48,893	13.873	29.987	0.777	0.613
12	4,541	6,423	11.579	21.246	2.551	3.308
13	2,447	10,844	9.546	11.076	3.900	1.022
14	3,087	4,655	12.615	20.468	4.085	4.396
15	1,256	2,801	21.942	19.140	17.474	6.833
16	4,327	19,082	17.433	29.043	4.029	1.522
Average	8,906	18,977	17.536	29.712	4.171	2.776
Weighted average						
EOE	54,707	91,802	77.063	111.111	1.408	1.260
DOE	15,008	33,536	26.452	40.000	1.762	1.184

Note: EOE = export-oriented establishments
DOE = domestic-oriented establishments

The big increase in capital intensity is caused not only by an increase in capital but also a decrease in labour. Like the electrical/electronic DOEs, a fall in demand is followed by fall in number of employees and this raises the capital–labour ratio. During the 1979–85 period, nominal demand actually increases but in real terms it is stagnant.

7.3.1.2 Labour Productivity

Labour productivity is measured by output per unit of labour. Both EOEs and DOEs have increased their productivity at almost the same rate by both weighted and unweighted measures. This pattern follows the earlier analysis where output increases while labour decreases.

The productivity of EOEs continues to exceed that of DOEs. Indeed the gap has widened from $31,000 in 1978 to $40,000 in 1985. This is because DOEs started from a much smaller base.

The fact that textile EOEs labour productivity is higher than DOEs is consistent with the findings of electrical/electronics industry. The conclusion from these observations is that competition forces the EOEs to increase productivity in order to overcome the effect of rising cost of labour.

7.3.1.3 Capital Productivity

Capital productivity is measured by output per unit of capital. Establishment 15 has an unusually high output/capital ratio of 17.4 in 1979. This distorts the 1979 ratio for DOEs. For this reason we refer to the weighted average which shows that the capital productivity for both groups is about the same. However, DOEs experienced a bigger decline than EOEs in the period 1979–85. This reverses the 1979 picture where DOEs have higher productivity than EOEs. The fall in capital productivity of EOEs is about 10 per cent while DOEs fall by more than 30 per cent. In view of capital increases during this period, the declining productivity indicates that the capital is not used efficiently.

In summary, these measurement indicate three things:

- EOEs are more capital-intensive than DOEs.
- The textile industry as a whole is showing signs of being more capital-

intensive in 1985. Although capital intensity has increased, the fashion industry in Malaysia is not as well developed as that of Hong Kong which has successfully switched from low quality to high quality textile products.

- Again, as in the electrical/electronic industry, capital increment in the textile industry is not matched by productivity.

Linking establishment size with capital intensity and with labour and capital productivities, we see different patterns emerging. Larger EOEs are found to be more capital–intensive and with higher labour productivity than the smaller ones. There is no link between DOEs' size of establishment and capital intensity. This is also true for capital productivity amongst both EOEs and DOEs.

7.3.2 Composition of Workforce

The proportion of unskilled labour is higher for DOEs (88 per cent) than EOEs (79 per cent) in 1979. This is shown in table 7.12. Both reduce the proportion of unskilled labour in 1985. The EOE reduction is the bigger so the gap is widened. In 1985 DOEs proportion of unskilled labour is 81 per cent(change of 7%), while EOEs is 58 per cent(change of 16%). This result is consistent with the earlier analysis of capital intensity but contrary to that of three factor substitution (It concludes that skill is not a significant factor of production). As EOEs and DOEs become capital–intensive they need more skilled labour.

Comparing tables 7.12 and 7.13 shows that DOEs use of labour categories of unskilled and SRP/primary education is consistent. For EOEs (1985) there is a big difference between 58 per cent unskilled and 73 per cent SRP/primary education. One explanation why a portion of SRP/primary education workers are considered as skilled workers may be that large EOE establishments in particular do a lot of in–house training. These workers are then considered as skilled.

Table 7.12

Composition of Skilled and Unskilled Workers

	Unskilled Workers (%)		Skilled Workers (%)	
	1979	1985	1979	1985
Export-oriented establishments				
1	73	78	27	22
2	96	82	4	18
3	87	81	13	19
4	61	40	39	60
5	72	93	28	7
6	66	67	34	33
7	47	38	53	62
Average	71	58	29	42
Domestic-oriented establishments				
8	88	72	12	28
9	89	86	11	14
10	87	85	13	15
11	86	89	14	11
12	93	95	7	5
13	89	51	11	49
14	89	95	11	5
15	83	75	17	25
16	n.a	82	n.a	18
Average	88	81	12	19

Note: n.a = Not Available

Table 7.13

Qualification of Employees in the Textile Establishment, 1985

Qualification	% of employees EOE	DOE
(1) University or Professional or College	1.9	2.6
(2) STP [a]	7.3	1.4
(3) SPM [b]	18.3	14.2
(4) SRP or Primary Education [c]	72.5	81.8

Note:
- a = STP is equivalent to A–level School Certificate.
- b = SPM is equivalent to O–level School Certificate.
- c = SRP is Lower School Certificate which was given for examination when students had done nine years of schooling.
- EOE = Export–oriented establishments.
- DOE = Domestic–oriented establishments.

Linking the change in proportion of skilled labour with change in capital intensity, we find that:

	Change in skilled workers	Change in capital–labour ratio
EOE	+ 16%	+ 78%
DOE	+ 7%	+113%

DOEs have the bigger increase in capital intensity than EOEs but lower increase in skilled labour. This does not appear to be consistent. EOEs may switch to producing products with higher technology and need to increase the complexity of the machines and thus require more skilled labour. It is essential for EOEs to maintain or produce higher quality products in order to succeed in international markets. DOEs might just increase the quantity of capital.

7.3.3 Wages

Table 7.14 shows the perception of wage increase among establishments. Wages increased by at least 11 per cent for all EOEs but only 75 per cent of DOEs agree with this point of view.

Table 7.14

Wage Increases between 1980 to 1985

Rate of increase	% of establishments EOE	DOE
Between 0% – 5%	–	12.5
Between 6% – 10%	–	12.5
Between 11% – 15%	50	37.5
More than 16%	50	37.5
Total	100	100

Note: EOE = Export–oriented establishments
DOE = Domestic–oriented establishments

Table 7.15 Monthly Wage Rates of Occupational Categories						
	Mean Value ($)					
Occupational	EOE			DOE		
Category	1979 $	1985 $	change %	1979 $	1985 $	change %
Management) Professional) Technical) Supervisor)	905	1415	56	1244	1246	0.2
Clerical	299	737	146	428	581	36
Production Workers	201	475	136	175	380	117

Note: EOE = Export–oriented establishments
DOE = Domestic–oriented establishments

The response to the question on actual wage rate for textile establishments was much better than for electrical and electronic ones. Table 7.15 shows the monthly wage rate. The only difficulty is that wage rates for management, professional, technical and supervisor categories are grouped together and we cannot examine each individually.

Naturally, wages have increased between 1979 and 1985 but the variation has been wide, ranging from 0.2 per cent to 146 per cent. The distribution of the increases has had the effect of reducing disparities and of enabling EOEs to catch up and overtake DOE wage rates. Thus the 0.2 per cent increase in wage for DOEs management has allowed the EOE management to "catch up" by way of a 56 per cent increase, so that EOE rates in 1985 exceed DOEs by about 15 per cent. Similarly for clerical employees where the 146 per cent increase in EOEs produces wages that in 1985 are 25 per cent more than DOEs.

The one area where the wages disparity has widened is the production workers group. In 1979 EOEs paid more and the 1979–1985 increase was higher than DOEs so that by 1985 production wages exceed DOEs by 25 per cent.

These large increases for the production workers are also consistent with earlier findings:

(i) proportion of unskilled workers has been reduced; and

(ii) establishments changing to more capital–intensive production processes.

7.3.3.1 Factors Affecting Wages

EOEs seem to be most concerned with retaining employees and ensuring good performance, when they choose responses (1) and (2) of table 7.16. The EOEs believe that the most important factors to affect wages are productivity and wage level of other establishments in the same industry. These factors are the same as those found among electrical/electronic EOEs. It shows that increasing productivity is crucial for EOEs.

By contrast, DOEs are more concerned with the reaction from organised labour and changes to the cost of living (Reasons 5 and 6).

Table 7.16

Factors Affecting Wages in the Textile Establishments in 1985

Reason	(No. of establishments) Rank 1		Rank 2	
	EOE*	DOE**	EOE	DOE
(1) Wage level of other establishments in the same industry	2		3	–
(2) Wage level of the manufacturing sector	–	1	1	2
(3) Productivity	3	1	–	–
(4) Government wage guidelines	–	1	–	1
(5) Trade Unions	1	2	–	2

Note: * = Establishment No. 6 did not respond.
** = Establishment No. 11 did not respond.

If, as suggested by table 7.15, the DOEs wage levels are generally lower, then they would be more closely related to the changes in cost of living, whereas EOEs are more concerned with retaining employees and obtaining greater productivity from their more capital– intensive operations.

7.4 Incentives

In 1979 only two kinds of incentive were available to EOEs; pioneer status and export incentive. Pioneer status is more beneficial and its qualifying criteria are quite easy to meet[2]. By 1985 incentives offered were more varied; pioneer status, export incentives, tax exempted imports and export tax exemption.

Pioneer status was granted to those EOEs which set up export–oriented production (establishments no. 4, 6, 7). These establishments have large capital and are foreign owned. Export incentives and tax exempted imports are perhaps the incentives that most encourage establishments that were originally set up for the domestic market (Establishments no.1, 2, 3) to venture into exporting. Export incentives include (i) deduction for promotion overseas (ii) accelerated depreciation allowance, and (iii) export allowance.

In 1979 pioneer status is the most important benefit enjoyed by DOEs (4 establishments). Other incentives received were export incentive (establishment no. 10) and tax exempted imports (establishment no. 11). By 1985 there is only a small increase in the number of DOEs enjoying incentives (5 establishments) but a big increase in the number of incentives enjoyed. The new incentives are locational factor, accelerated depreciation allowance, export allowance, sales tax exemption and non–fiscal government assistance[3]. Establishment no. 10 enjoyed

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[2] Details on incentives are discussed in chapter 3.

[3] Non-fiscal government assistance is in the form of:
- (i) Business training
- (ii) Advisory service
- (iii) Low rental for business premises
- (iv) Electricity rebate

five types of incentive while in 1979 it only enjoyed two. This shows that establishments can qualify for varying types of incentives for a long time.

Tax exempted imports help producers to reduce production costs and this is important to any exporting establishment (EOE or DOE) which is not located in a FTZ. An establishment in FTZ gets automatic exemption and this is confirmed by the last two columns in table 7.18. The same table also shows that all EOEs imported part or all of their inputs but did not pay any import duties. This is because establishments 4, 6, 7 are located in FTZs while establishments 1, 2, 3, 5 could make tax exempt imports.

This benefit is not extended to all exporting DOEs because only a number of them received tax exemption on import (TEI). Hence, there are three possible benefits for exporting DOEs.:

(i) Does not receive TEI but located in FTZ.; establishment receives tariff–free inputs;

(ii) Does not receive TEI but gets other incentives for export; no tariff–free inputs but receives allowances or allowed bigger deduction from taxable income;.

(iii) Does not receive any incentive.

All DOEs interviewed said they did not receive any special incentive for producing for the domestic market. These establishments probably are not aware of the tariff protection granted by the government in the form of import duties.

All EOEs and DOEs considered incentives to be an important factor for their future well being (table 7.18). A proportion of the sample that responded gave clear signals of the direction of the future incentives. Firstly, both EOEs and DOEs prefer the continuation of the present fiscal incentives system especially the pioneer status. However, the DOEs felt that financial assistance in the form of lower interest rates on borrowing to finance production and easier access to

Table 7.17

Incentives Received by Textile Establishments in 1979 and 1985

Incentives	Establishments 1979 EOE	Establishments 1979 DOE	Establishments 1985 EOE	Establishments 1985 DOE
1) Pioneer status	4,6,7	9,10,11,12	4,6,7	9,10.11
2) Labour utilisation relief	–	–	–	10
3) Export incentive	1,4	10	2,3	–
4) Locational incentive	–	–	–	10
5) Accelerated depreciation allowance	–	–	–	10,11
6) Tax exempted imports	–	11	1,2,3,5	10
7) Export allowance	–	–	1	16
8) Sales tax exempton	–	–	–	15
9) Export tax exemption	–	–	5	–
10) Non-fiscal govt.assistance	–	–	–	9,11

Note: EOE = Export-oriented establishments
DOE = Domestic-oriented establishments

Table 7.18

Importance of Incentives to Textile Establishments

Establishment	Are incentives essential for the future of your establishment	Would your establishment respond to the new government export promotion incentives	Type of input required	Import input material	Paid import duties
Export-oriented establishments					
1	Yes	n.a	F,L	Yes	No
2	Yes	n.a	F,L,FA	n.a	n.a
3	Yes	n.a	F,NF,FA	Yes	No
4	Yes	Yes	ETE	Yes	No
5	Yes	n.a	n.a	Yes	No
6	Yes	n.a	F,NF	Yes	No
7	Yes	No	F,L,FA	Yes	No
Domestic-oriented establishments					
8	n.a	n.a	n.a	No	No
9	Yes	No	F,NF	Yes	No
10	Yes	n.a	n.a	Yes	No
11	Yes	n.a	F,L,NF	Yes	Yes
12	Yes	No	F,L	Yes	Yes
13	Yes	Yes	L,FA	Yes	No
14	Yes	n.a	L	No	No
15	Yes	Yes	L,F,FA	Yes	Yes
16	Yes	Yes	F,L,FA	Yes	Yes

Note:

n.a = Not available; F = Fiscal incentives; NF = Non-fiscal incentives
L = Loans; FA = Other financial assistance; ETE = Export tax exemption

funds are also important. This might be explained by DOEs small capital base (indicated by average capital size); they have less financial capability than EOEs. Furthermore, these DOEs (with a small capital base) usually do not qualify for pioneer status.

Secondly, export incentives are only considered important by DOEs that are changing from the domestic to the external market. EOEs are indifferent to the question of export incentives because they use pioneer status to set up export–oriented activities; by comparison other export incentives are unimportant.

7.5 Summary of Textile Establishments Characteristics

The various characteristics are grouped into two; (i) those shared by EOEs and DOEs, and (ii) those where EOEs are different from DOEs. These two types of establishment are also studied to see their performance from 1979 to 1985. This is followed by a discussion on the employment potential and trend of each type of establishment. We conclude with key observations about the industry.

Shared characteristics

(a) Basic characteristics;

- (i) Products – some are exclusively produced by EOEs or DOEs while others are produced by both.
- (ii) Location – EOEs and DOEs are in various places, from FTZ to Industrial Area.
- (iii) Ownership – foreign and local ownership is found in both categories.
- (iv) Status – an establishment is a subsidiary if it is foreign owned. However, if locally owned it is not part of any group

(b) Technology

The middle processing stage uses the most advanced technology compared with other stages.

(c) Capacity utilisation

Both are well utilised. During the 1979–85 period both reduced the number of days worked.

(d) Auxiliary relationship

EOEs and DOEs have some backward linkages. Forward linkage depends on whether they are part of an integrated group or not.

(e) Wages

Largest increase was in the production workers category. EOEs experienced higher wage rises than DOEs over the period 1979–85 .

Different characteristics

(a) Employment

DOEs average employment size in 1979 (626) is bigger than EOEs (493).

(b) Capital

EOEs average capital size is 3 times larger than DOEs.

(c) Technology

EOEs use more advanced technology.

EOEs: 33 per cent advanced, 67 per cent medium

DOEs: 100 per cent medium

(d) Forward linkage

EOEs have no forward linkage while DOEs do have some.

(e) Capital intensity

EOEs more intensive than DOEs.

1979–85: both increase capital intensity with the DOEs increase being bigger than EOEs

(f) Labour productivity

EOEs more productive than DOEs.

1979–85 : both increase at similar rates.

(g) Capital productivity

DOEs more productive than EOEs.

1979–85: both decline with DOEs falling more than EOEs.

(h) Unskilled workers

DOEs have a higher proportion of unskilled workers than EOEs.

1979–85 both reduced their proportion of unskilled workers.

Changes, 1985 over 1979

	EOE	DOE
Output	+22%	+9%
Employment	–19%	–28%
Capital	+36%	+61%

Even though output increases, capacity utilisation (number of days worked) falls slightly in 1985, so the increase in output may be due to labour productivity increasing.

Employment Potential and Trend

At first glance we can conclude that DOEs have greater employment potential than EOEs due to their larger average employment size and lesser capital intensity. However, from other aspects, EOEs chances are better; EOEs employment reduction is less than DOEs (-19 per cent vis-a-vis - 28 per cent) and EOEs rate of capital intensity increase is also smaller. The employment reduction may be an unusual phenomenon because of the severe recession in 1985. Thus, if this factor is ignored, then DOEs employment creation capacity is greater than EOEs.

The employment reduction is also contrary to the elasticity of substitution trend for this industry as shown in chapter 5 (table 5.3). The elasticities show that both the EOEs and DOEs have increased their substitution possibilities from 1979 to 1985. However, EOEs whose elasticity increase is much bigger than DOEs (50 per cent vis-a-vis 14 per cent), experience a smaller employment reduction. This may be due to the fact that EOEs weathered the recession better than DOEs. Thus, it is difficult to arrive at any conclusion due to the unusual economic situation; the recession may have distorted the true picture.

This case study also found that textile DOEs are competitive. They are able to move to export markets and respond to changes in consumer preference. Their competitiveness is helped (the extent is unknown) by government incentives such as export incentive and tax exempted imports.

7.6 Comparison of EOEs and DOEs Characteristics of Electrical and Electronic and Textile Industries

In this section we summarize the salient features of EOEs and DOEs, as evidenced in the textile and electrical and electronic industries. As will be seen, sometimes the difference lies between EOEs and DOEs and in other cases the difference arises more strongly between the two industrial sectors. Findings about the characteristics would help to:

(i) indicate how EOEs and DOEs respond to industrialisation policy;

(ii) show the factor proportions in these establishments which will be useful in identifying employment potential;

(iii) highlight EOEs and DOEs performance in a period of domestic and global recession.

We think the clearest way of demonstrating the various differences is to show a series of summary tables (7.19 to 7.22) which draw on the preceding tables. In all those tables the abbreviations are for:

E + E : electrical and electronic industry.

TEX : textile industry.

Table 7.19

Different Characteristics of EOEs and DOEs

(1) Capital Size($Million)

	E+E		TEX	
	EOE	DOE	EOE	DOE
1979	12.67	2.52	26.97	9.39
1985	8.51	8.63	36.67	15.19

EOEs capital size is larger than DOEs.

(2) Capital Productivity (O/K)

	E+E		TEX	
	EOE	DOE	EOE	DOE
1979	4.9	7.7	2.2	4.2
1985	2.8	6.3	0.8	2.7

DOEs have higher capital productivity than EOEs.

(3) Level of Technology

	EOE	DOE
TEX	33% advanced, 67% medium	100% medium
E+E	50% advanced, 50% medium	100% medium

EOEs level of technology is more advanced than DOEs.

Table 7.20
Similar Characteristics

(1) Auxiliary Relationship

	EOE		DOE	
	backward linkage	forward linkage	backward linkage	forward linkage
TEX	some	no	some	some
E+E	minimal	no	some	no

Both DOEs and EOEs have some backward linkages. However they almost have no forward ones.

(2) Largest Wage Increase

	EOE	DOE
TEX	production workers	production workers
E+E	production workers	production workers

(3) Incentives

EOE		DOE	
E+E	TEX	E+E	TEX
All establishments received pioneer status (PS). It is used to set up activities but when expired can enjoy other incentives	Most important incentive is PS. It is used to set up activities. More incentives enjoyed in 1985 especially incentives that make exports cheaper	75 per cent enjoyed PS. Also enjoy other incentives	Most important incentive is PS. Tax exempted imports and export related incentives encourage DOEs to export

(4) Production Technique

	EOE	DOE
TEX	cheapest technique	cheapest technique
E+E	cheapest technique	cheapest technique

Table 7.21

Differences Between Industries

(1) Products

	E+E	TEX
EOE :	component and some consumer products	A lot of overlapping products; difficult to distinguish between EOEs and DOEs
DOE :	consumer, industrial and communication equipment, cables	

(2) Location

EOE :	FTZ or LMW	No difference between EOEs and DOEs, both are located in various places; from FTZs to industrial areas
DOE :	Industrial estates	

(3) Ownership

EOE :	foreign	No difference between EOEs and DOEs; some are foreign while majority are local.
DOE :	local	

(4) Status

EOE :	all are subsidiaries	No difference; those that have foreign owners are subsidiaries
DOE :	mainly independent	

(5) Most advanced level of technology used in production stages.

EOE :	beginning stage	middle stage
DOE :	beginning stage	middle stage

(6) Employment Size (persons)

	E+E		TEX	
	EOE	DOE	EOE	DOE
1979	1085	228	493	626
1985	1421	209	399	452

For textile industry DOEs size is larger than EOEs but the reverse is true for electrical and electronic industry.

(7) Capacity Utilisation (no. of days worked)

	E+E		TEX	
	EOE	DOE	EOE	DOE
1979	310	278	307	316
1985	271	257	299	310

Textile DOEs have higher utilisation than EOEs but the reverse is true for electrical and electronic industry.

(8) Capital Intensity (K/L)

	E+E		TEX	
	EOE	DOE	EOE	DOE
1979	15,100	11,200	35,209	8,906
1985	42,650	67,075	62,886	18,977

Textile EOEs are more capital–intensive than DOEs but it is the reverse for electrical and electronic industry.

(9) Labour Productivity (O/L) – $'000

	E+E		TEX	
	EOE	DOE	EOE	DOE
1979	52.7	76.9	46.3	17.5
1985	76.2	78.6	79.5	29.7

Textile EOEs are more productive than DOEs but the reverse is true for electrical and electronic industry.

(10) Percentage of Unskilled Workers

	E+E		TEX	
	EOE	DOE	EOE	DOE
1979	78.1	77.8	71	88
1985	70.4	68.9	58	81

Textile DOEs use more unskilled workers than EOEs, but they are quite evenly balanced for electrical and electronic industry.

Table 7.22

Establishments Performance (1979 – 85)

	EOE		DOE	
	E+E	TEX	E+E	TEX
Output	+103.9%	+22%	+7.1%	+9%
Employment	+ 30.9%	–19%	–8.3%	–28%
Capital	+361.8%	+36%	+639%	+61%

During this period of recession, EOEs performed better in terms of output and employment. DOEs have higher increment of capital than EOEs.

We now offer some comments on the above tables:

(i) Clear differences observed

The differences are mainly associated with capital. EOEs use more capital than DOEs and have a more advanced level of technology. For example, EOEs capital size is three to five times greater than that of DOEs.

The more advanced level of technology used is influenced by parent companies and competition. Electrical and electronic EOEs are usually part of a bigger production process, the rest of which is located in developed countries. Thus, EOEs usually adopt the technology of these countries. For textile EOEs, they need to produce quality products in a highly competitive market.

Although DOEs need less capital, they use it more productively.

(ii) Characteristics in which no clear difference can be seen

Both types of establishment have equal access to and enjoy a wide range of incentives. The most popular incentive, in both establishments, is pioneer status. Both establishments also experienced large wage increases among the least skilled employees – production workers.

In terms of linkages, both types of establishment have some backward relationship but almost none have forward ones. The existence of backward linkage implies a network of intermediate industries to supply inputs to these establishments. Products of EOEs and DOEs are either finished or if intermediate, they are all exported. Hence no forward linkage is found.

Another finding from the case studies deals with the question about substitution possibilities. Although EOEs and DOEs production function estimates have shown the existence of substitution possibilities, these are not clear at the establishments level due to the poor response on this question. However, the unclear response does not mean that the substitution possibilities can then be dismissed entirely. Both EOEs and DOEs are still sensitive to some degree to factor prices because most of them have replied that they use the cheapest production technique. Thus, they will consider changing to more appropriate techniques if the relative price of labour and capital changes.

(iii) Characteristics in which the clearest differential can be seen between industries rather than between EOE/DOE.

There are definitely more characteristics in this group than in the previous two. These characteristics can be divided into three subgroups:

(a) The textile industry characteristics are completely different from those of electrical and electronic industry. Characteristics in this subgroup are mainly the basic ones like type of product, location, ownership, establishment status and market for product.

There is a dualism in the electrical/ electronic industry; EOEs produce electronic components, located at special industrial zones and are subsidiaries of foreign companies. Electrical/ electronic DOEs produce consumer goods at no special location and are locally owned.

For the textile industry, there is no difference in basic characteristics between EOEs and DOEs. In other words textile EOEs and DOEs cannot be identified just by looking at these characteristics whereas it is possible to do so in the electrical and electronic industry.

Another difference found is the level of technology used in the production process; for electrical and electronic the most advanced technology is used at the initial production process while textiles uses it in the middle stage.

(b) In this subgroup, textile DOEs have greater employment size, capacity utilisation and percentage of unskilled labour than do EOEs. However the situation is the opposite in electrical and electronic industry.

(c) For the third subgroup, textile EOEs have greater capital intensity (K/L) and labour productivity (O/L) than do DOEs. For electrical and electronics, it is the DOEs that have greater values than EOEs.

A number of the differences found between industries and types of establishment follow from the origin of the EOE part of each industry. An additional factor is the type of ownership. Electrical and electronic EOEs are organizations implanted from developed countries and so are largely foreign–owned. With a larger capital base and products which are meant as intermediate inputs for developed countries, these establishments are part of multinational corporations which are generally bigger than establishments with operations in just one country. Therefore, they have the financial resources to make larger investments than domestic establishments and to make use of the incentives offered by government to locate their plants. DOEs are mainly set up as import substitution establishments. Many textile EOEs, on the other hand, started as DOEs and therefore it is difficult to separate their basic characteristics from DOEs.

7.7 Employment Generation Potential

The type of establishment (EOE or DOE) is considered to favour employment creation if it can generate a higher demand for labour. In this study, three criteria are used to measure an establishment's ability to increase demand for labour:

1) Growth rates — Sustainable high growth ensures not only the establishment's continued viability, but also increases employment opportunities.

2) Capital intensity — If there is high capital intensity at a given growth rate, more capital is needed relative to labour. Therefore low capital intensity is preferred for employment creation.

3) Present employment size — Establishments with a bigger labour force have, all things being equal, better prospects of employing more people under a given rate of growth.

These three criteria should be viewed together to give a comprehensive picture of employment creation. Viewing any one of them in isolation of the others may distort the real effect - for example:

1) Large employment size does not mean more demand for labour if there is no or little growth.
2) In the case of low growth, capital intensity plays a critical role - establishments with lower capital intensity can create higher demand for labour.

Results from the case studies concerning these three criteria are rather equivocal. EOEs definitely have higher growth than DOEs (for example, in the electrical and electronic industry the rates are 104 per cent and 7 per cent respectively for the period 1979-1985). Growth rate is especially important in view of the recessionary period covered by the study. It shows that EOEs can withstand recession better. Maybe wider markets help EOEs to achieve this growth. DOEs were quite badly affected by the recession and in certain cases they did not grow at all, in real terms.

EOEs high employment potential as a result of growth is further enhanced by their large employment size; five times larger than DOEs, at least so far as the electrical/ electronic industry is concerned. For the textile industry, DOEs have slightly larger employment size than EOEs. Notwithstanding the employment pattern in the textile industry, EOEs are still better at increasing the demand for labour than DOEs, especially in view of their high rate of growth.

However, EOEs potential is reduced by their high capital intensity. In general, EOEs are much more capital-intensive (except for electrical/ electronic industry in 1985 where its DOEs are more intensive). This drastic increase in capital intensity in DOEs (1985) is primarily due to the fall in demand as a result of the recession which made a large amount of capital idle and labour was reduced.

Although it is difficult to arrive at a conclusion concerning establishment employment potential due to the contrasting trends in demand for labour, the EOEs, on balance, have the bigger employment potential. This is based on their strong growth effects and generally larger employment size. High growth can overcome the problem of capital intensity especially in a situation where the difference in capital intensity between the two types of establishment is marginal. Furthermore, the case studies also show that EOEs rate of capital intensity increase is much lower than that of DOEs.

This ambivalent conclusion (based on the case studies) is in contrast to the elasticity estimates of both industries which clearly show that EOEs substitution possibilities are greater than those of DOEs.

CHAPTER 8

CONCLUSION

8.1 Introduction

Section 8.2 starts by summarizing the findings of the previous chapters and concludes that export-oriented industrialisation (EOI) is more able to create employment because export-oriented establishments can absorb more labour through growth and employment size and larger elasticity of substitution than domestic-oriented ones. In order to realise this employment potential, it is essential to examine ways to enhance EOI and change relative factor price.

But before we consider future policies the Malaysian industrial experience is compared with that of other LDCs (section 8.3). Malaysia lies between the two extremes of industrialisation. At one end are the Asian NICs, with very aggressive export policies. At the other end are countries such as India and Peru where the bias for import substitution is still very strong. It is suggested that Malaysian EOI policy should follow the market orientation approach (with certain modifications) which is neither of these two.

Section 8.4 suggests two ways to increase employment. First, promotion of EOI (which can create employment opportunities) should be through liberalisation of trade policy and the reform of fiscal incentives. Second, changes of relative factor prices should be made. Since Malaysia has flexible factor substitution (the elasticity of substitution is about 1.5), the labour coefficient increases by 8 to 25 per cent, depending on the incentives enjoyed, when factor market distortion is eliminated. This increase represents 120,000 to 360,000 new jobs in the manufacturing sector.

Liberalisation of trade policy to promote EOI involves the reduction of the average tariff level and its dispersion. The present exchange rate policy should be maintained because it helps EOI. To change relative factor prices, the import duty (tariff) on machinery and equipment should be reduced and the import duty exemption withdrawn, so that capital prices could closer reflect the world level.

To encourage EOI, the list of promoted industries/activities in the fiscal incentive system, must include more of those that are involved directly or indirectly with EOI. The present export incentives should be available more widely; for example by loosening the criteria for the export credit refinancing scheme (ECR). The present exemptions on import duty for inputs should continue. New export incentives should also be introduced such as utilities priced for export manufacturers at levels equal to other competing countries. Another reform should be introduced to fiscal incentives in order to influence relative factor price: the Investment Tax Allowances should stop because the benefits directly favour capital users.

Policy related to the labour market is also relevant to factor prices. The government should not increase its intervention in the labour market and wage setting methods must be re-evaluated.

8.2 Summary of Findings

The Malaysian government embarked on economic diversification (and industrialisation in particular) to reduce dependence on the agricultural sector and to promote growth.

An import substitution strategy was first adopted but subsequently the emphasis was changed to export-oriented industrialisation. However, the import substitution strategy is still being practised, in particular for the promotion of heavy industries (for example the Proton Saga car project and the Perwaja Steel Mill).

Trade policy was initially used to promote import substitution industrialisation. Tariff was the main instrument for this purpose, but it was used only moderately. Compared to many other LDCs, the Malaysian trade regime is not restrictive. For example, in 1980s the majority of items (about 70 per cent) subject to import duty were charged a rate below 30 per cent. Since then, this upper scale of tariff rates has declined further. Now, the government has quantitative restrictions on a very limited number of items.

Another indicator of moderation in the Malaysian trade regime is that on average the effective protection rate is about 46 per cent. Therefore, it is not too difficult to change a moderate trade policy of promoting import substitution to be more receptive to an export-oriented approach.

Since 1988, the government has reduced the tariff rates of many products. Nevertheless there is evidence that tariff still adversely effects exporters. For example, it was found that 60 to 70 per cent of the tariff cost intended to protect domestic production is ultimately borne by exporters.

The success of the export-oriented strategy lies with the incentive system. Incentives can be grouped into two: the ones that are based on market orientation and those that are not.

In the first group, only the Free Trade Zone and Licensed Manufacturing Warehouse incentives could be considered as giving significant benefits. However, establishments located in these areas are also eligible for pioneer status and other incentives under the second group.

The second group contains the more important incentives such as pioneer status. This has encouraged many foreign companies to set up activities meant only for exports. A good example is the electronic components industry.

Other export incentives such as the export credit refinancing scheme and the double deduction of export credit insurance premiums do not appear to provide substantial benefits. From the case studies in chapters 6 and 7, DOEs that had changed their market orientation to exporting did not cite incentives as the reason for doing so. DOEs benefit more from incentives which are not based on market orientation (such as pioneer status). Furthermore, the qualifying criteria for export incentives are more complicated than for pioneer status.

Therefore, although the fiscal incentives did not emphasize market orientation, they did produce export-oriented industrialisation.

Beside promoting the different strategies, another result of the fiscal incentives and trade policy has been their effect on the cost of capital. Fiscal incentives are found to reduce capital cost much more than trade policy. This is done in two ways:

i) Benefits to capital users under fiscal incentives are more substantial than under trade policy. The estimated user's cost of capital under fiscal incentives shows a much larger reduction than that of trade policy.
ii) Since fiscal incentives are given on a case by case basis, they can be targetted to a particular group and bigger benefits can be given. On the other hand, trade policy is given "across the board". Thus the benefit to each establishment cannot be excessive because the financial consequence is greater overall.

Even though trade policy reduces cost of capital by less, the import duty exemption gives manufacturers access to capital equipment at world price levels. However, this benefit is given mainly to establishments in Free Trade Zones and Licensed Manufacturing Warehouses. Other establishments have to apply for this benefit and approval is restricted.

Beside having policies that reduce the cost of capital, another characteristic of the Malaysian manufacturing sector is easy access to capital. No quota or restriction is imposed on capital for any particular sector or industry. Neither is there any licensing system for imported capital, although such movements must be reported.

The availability of capital and its relatively low cost should be viewed together with the situation in the labour market. The levels of capital and labour costs are crucial in determining the relative price changes which in turn influence the demand for these factors of production.

Few incentives are available to employers of large numbers of workers. Trade policy is not linked to the proportion of labour used; for example, imported inputs are not given a reduced tariff rate if large numbers of workers are employed. The fiscal incentives did give an income tax exemption on such a basis but in the latest Act (Promotion of Investment Act 1986) labour related benefits are insignificant. Furthermore, establishments can get the same or even more benefit by using other non-labour criteria. Thus there is no policy that reduces the cost of labour. In fact the opposite has happened; real wages are increasing and the labour market is slow to respond to market forces.

Now the question is, "how are the fiscal incentives policy and trade policy going to effect employment ?" The effects come through (i) the changes in demand for labour as a result of varying factor prices due to both policies, and (ii) the different labour requirement of each type of industrialisation (EOI or ISI) that they promote. The first effect depends very much on the elasticity of substitution; if one factor can be substituted with another, then price changes will have an impact. The second one is based on the employment generation capabilities of export-oriented establishments (EOEs) and domestic-oriented establishments (DOEs) as obtained in the case studies. As such, the employment potential is analysed through the elasticity of substitution and characteristics of establishments which are either export promotion (EOEs) or import substitution (DOEs).

As unemployment becomes a pressing problem[1], the country should pursue a growth policy that will also generate the maximum possible employment. In the Malaysian case, the government has to decide which of the two strategies (import substitution or export promotion) fulfil the above criterion or to adopt a balance of the two.

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[1] It was estimated that in 1988, the unemployment rate was 8.1 per cent and the workforce growth rate was 3.4 per cent per annum (Government of Malaysia, Treasury Economic Report, 1988/1989)

Table 8.1 shows that EOEs have a slightly higher elasticity than DOEs. This is true in both 1979 and 1985 for the electrical and electronic industry but only in 1985 for textiles. The difference is quite small, in 1985 for example in the electrical and electronic industry the elasticities are 1.105 and 1.408 for DOEs and EOEs respectively. The difference is greater in 1979 (0.816 versus 1.413). In 1985, the elasticities of the various categories converge around the value 1.1.

There is no conclusive pattern when linking elasticity with capital intensity; low intensity does not necessarily imply higher elasticity.

It is not easy to separate the characteristics of EOEs from DOEs. What is true of the electrical and electronic industry turns out to be the reverse for textiles.

Table 8.1

Estimated Two Factor Elasticities of Substitution for the Textile and Electrical/Electronic Industries and Their Product Groups, 1979 and 1985

	Elasticities of Substitution				
	1979	1985		1979	1985
Textile	0.893 *	1.173 *	Electrical & Electronics	1.014 *	0.713 *
Domestic-oriented	1.008 *	1.152 *	Domestic-oriented	0.816 *	1.105 *
Export-oriented	0.791 *	1.188 *	Export-oriented	1.413 *	1.408 *
32111	0.543 *	0.839 *	38310	0.89 *	0.877 *
32112/3	1.056 *	1.285 *	38320	1.413 *	—
32114	0.768 *	1.029 *	38329	—	0.468 *
32115	0.72	1.211 *	38321/2	—	1.265 *
32120	1.396 *	1.305 *	38330	1.122 *	1.279 *
32130	0.83 *	1.182 *	38391	1.126 *	1.189 *
32201/9	0.659	1.095 *	38392	0.593 *	1.018 *
			38399	1.273 *	1.265 *

Note: * One parameter significant at 5 % level

This is due to the origin of the industries; the textiles EOEs started domestically, electrical and electronic ones are mainly foreign direct investment.

However, we can manage to make some observations about capital and labour use, and employment potential (table 8.2). In terms of capital use, two characteristics are considered: average capital size and capital intensity (capital-labour ratio). Both show that EOEs are more capital-intensive than DOEs. Although in 1985 the electrical and electronic DOE's capital intensity is higher, this situation is caused primarily by idle capital which was a result of the demand reduction and thus considered as not a real increase in capital intensity. This situation is supported by the higher electrical and electronic DOEs average capital size in 1985. Taking this effect into account EOEs capital intensity is higher.

Table 8.2

Summary of Changes from 1979 to 1985 for Selected Characteristics

		1979		1985	
		EOE	DOE	EOE	DOE
1)	Average capital size ($million)				
	Textiles	26.97	9.39	36.67	15.19
	Electrical/electronics	12.67	2.52	8.51	8.63
2)	Capital/labour ratio (capital intensity)				
	Textiles	35,209	8,906	62,886	18,977
	Electrical/electronics	15,100	11,200	42,650	67,075
3)	Average employment size (persons)				
	Textiles	493	626	399	452
	Electrical/electronics	1,085	228	1,421	209

The electrical and electronics EOEs appear to be better at labour absorption than DOEs - average employment size shows bigger values for EOEs. However, it is the reverse for the textile industry; DOEs absorb more labour. One noticeable feature: the difference in employment size between EOEs and DOEs in the

Table 8.3 Establishments Performance ,1979-85 (in percentage)				
	EOE		DOE	
	E + E	TEX	E + E	TEX
Output	+ 104	+ 22	+ 7	+ 9
Employment	+ 31	- 19	- 8	- 28
Capital	+ 362	+ 36	+ 639	+ 61

Note: E+E = Electrical/electronic industry
TEX = Textile industry

electrical and electronic industry is much larger (1421 versus 209) than that of the textile industry (399 versus 452).

The ability to generate employment is not restricted to the above characteristics. The pattern of growth from 1979 to 1985, as evidenced by output, employment and capital growth is also important (table 8.3).

Based on their bigger output growth we found that EOEs are more viable than DOEs. This fact is especially important because the period under consideration contains a recession. Thus, the much better performance of EOEs may be due to their extensive marketing network.

EOEs also perform better in terms of trend in labour and capital use. Within the electrical and electronic industry the EOEs increase employment while the DOEs decrease and in textiles the EOEs reduction is less than for DOEs.

The DOEs capital increase is much bigger than the EOEs. As a result, electrical and electronic DOEs, whose capital intensity was smaller than the EOEs in 1979, became bigger in 1985.

The case studies show that EOEs employment creation potential is better than DOEs. This is based on three criteria - growth rates and viability, employment size and capital intensity. Although EOEs capital intensity is greater than DOEs, the other two measures (growth and viability and employment size) suggest that EOEs employment generation potential is greater than DOEs. Their growth and viability is found to be stronger and this shows that EOEs have very good growth capacity. EOEs high capital usage is due primarily to the type of technology used. EOEs in both industries use more advanced technology. Although their technology is more advanced, the EOEs (in the electrical and electronic industry, in particular) are also the biggest employers.

In conclusion, the EOEs can generate more employment than the DOEs because:

(i) Their elasticity of substitution exists and is slightly more than DOEs'.

(ii) On two out of three criteria, EOEs have better employment potential than DOEs.

Even though this potential exists, it needs to be supported with the appropriate policy. As discussed earlier, two policies namely trade policy and fiscal incentives affect the demand for labour. These implications will be studied in section 8.4

8.3 Comparison of Malaysian Industrial Policy with Selected LDCs

This section compares Malaysian industrial policy with the policies practised by selected LDCs, in terms of the policies chosen and the ways in which they were implemented.

The selected LDCs are grouped into three:

(i) The Asian NICs - South Korea (Korea), Taiwan and Singapore.

(ii) Latin American countries - Brazil, Argentina and Colombia.

(iii) Completely import substitution countries - India, Peru and Tanzania

The economies of the first group (the NICs) are very dependent on exports and this export-oriented industrialisation is most successful. The second group, the Latin American countries, follows a policy that balances import substitution and export promotion. The third group have a strict import substitution policy and relatively limited exports. Malaysian industrial policy lies between the first and third group. It started with import substitution and now pursues export promotion.

Countries from all three groups started their industrial development process with import substitution. Some still continue (India) while others very soon moved away from it (Singapore). The import substitution policy can be divided into two:

(i) first round — producing consumer non-durables and known as the "easy" stage.

(ii) second round — mainly involving heavy industries and producing intermediate goods.

For Singapore and Taiwan, their import substitution is mainly at the first round. However, Korea is different: it concentrates its investment in heavy industries not for import substitution but for exports. India's industrialisation was the second round type; in the 1960s Indian steel mills were an example of successful import substitution industrialisation.

The Asian NICs, Malaysia and the Latin American countries have changed their industrialisation policy from import substitution to export promotion, in search of higher growth. The degree of implementation of this export promotion policy varies greatly between these countries. The strongest is probably practised by Korea.

In Korea, instead of the market mechanism allocating resources and guiding entrepreneurs, the government made most of the important investment decisions[2]. To encourage exports, the government gave subsidies and incentives.

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[2] Amsden, A., 1989. Asia's Next Giant: South Korea and State Industrialisation, New York, Oxford University Press.

But in return, it demanded that export targets were met. The subsidies and incentives took various forms, among them:

- If export activities were not profitable, the government compensated by allowing companies to sell goods at a high domestic price. This was done through setting a very high tariff level.
- Exporters were allowed to import inputs duty free.
- Very low or negative interest rates for export-related borrowing.
- Exemption from indirect taxes on exporters' output and input.
- Incentives were also given to indirect exporters, that is producers of intermediate goods that end up in exports.
- Export companies that performed well in the export market or made R & D or introduced new products, were given licenses or opportunities for expansion into other businesses.

The Malaysian export promotion policy is not that extreme and government intervention is not pervasive. The most important incentive (the pioneer status) in the Malaysian incentive system is neutral in terms of market orientation. The success of export-oriented industrialisation is mainly due to foreign direct investments by multinational companies. The Malaysian government does not impose export performance targets when granting incentives. Export performance is also not related to obtaining a license from the government with all the potential difficulties that may arise. Bad export performance is also not compensated. However, in one aspect Malaysia is similar to Korea; exporters can use tax exempted imported inputs. Other subsidies/facilities offered by the Malaysian government such as export financing (ECR) and double deduction on export promotion, although of some benefit, are insignificant when compared with the Korean ones.

Malaysia did follow in Korean footsteps by formulating a plan for industrial development (mainly exports). It was drawn up in 1985 and is called the Industrial Master Plan. It identifies new export products and sets targets for them as well as for the existing exports. However, it is only an indicative plan and there is no vigorous implementation.

Another of the Malaysian government's steps to control industrial development met with resistance. The Industrial Coordination Act (1975) requires companies exceeding a certain investment level to obtain government approval and to be licensed. After dissatisfaction shown by the manufacturers, the government increased the minimum level of investment to $ 2 million or 75 or more full time workers. With this ruling, only large companies have to comply with the Act.

The Taiwan and Singapore policies are somewhere between Korea and Malaysia. Their governments show active interest but allow the private sector to decide on products and export destinations. However, that statement has to be qualified; sometimes those governments have directed industrialisation. For example, when wages increased rapidly in the mid–1970s, the Singapore government decided to switch from labour-intensive to capital-intensive industries.

The Latin American countries' change process was much slower. They reduced import substitution through tariff cuts and import liberalisation. Exporters are not allowed duty free imported inputs. Thus, to compensate the export sector for having to purchase inputs at high domestic price, governments gave subsidies. However, this is not enough to provide export incentives comparable with the protection of the domestic market[3]. The bias on import substitution continues.

Countries industrialising after the Second World War mainly did it with borrowed technology. In the Malaysian case, the technology mainly came with the multinationals. Japanese, American and European multinationals moved some of their production to lower wage countries such as Malaysia.

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[3] Balassa, B., 1980. "The Process of Industrial Development and Alternative Development Strategies", World Bank staff working paper No.438.

Korea did it differently; it did not allow foreign investment except in the labour-intensive export sector. Their industrialisation comes through buying foreign patent licenses and apprenticeship in which the imported technology is further improved. This is the strength of Korea's industrialisation which many countries, including Malaysia are unable or unwilling to follow.

Another characteristic that differentiates the Korean export industrialisation process from other LDCs is the role of big business enterprises - the Chaebol. These few enterprises spearhead export activities and receive massive support from the government. In other countries such as Taiwan, Malaysia and Thailand, the exporting firms are many and small.

Malaysia has achieved some degree of success in its export-oriented industrialisation but still lags behind the Asian NICs - Korean, Taiwan and Singapore. The questions now are, firstly, is export-oriented industrialisation the appropriate strategy for Malaysian development ? Secondly, if it is so, what is its future direction - should it follow the Korean method of strong government intervention or should it adopt policies that liberalise prices and let the market decide?

These questions are taken up in the next section where we discuss policy implications.

8.4 Policy Implications

Although industrialisation is chosen as the engine of growth, it also has other objectives. The Industrial Master Plan states:

"Industrialisation was advocated to reduce the problems of Malaysia's dependence on manufactured imports from abroad and export dependence on a few primary commodities. Relatively high value added per worker, creation of large employment opportunities, extensive linkage effects to other sectors and greater external economies of manufacturing were also important factors that justified the government determination to emphasize industrialisation"

This thesis examines only one of the objectives mentioned above - employment creation. Employment potential must be supported in two ways:

(1) This study has concluded that EOI has a greater employment generation capacity than ISI (section 8.2). As such, the EOI is the appropriate strategy to create empolyment and the government should find ways to enhance it.

(2) With flexible capital-labour substitution, the government can influence factor proportions through changes in relative factor prices. For example, if the price of capital is fixed, and the government introduces a policy that subsidises the labour cost; since substitution exists, more labour would be demanded.

8.4.1 EOI Strategy

Section 8.3 identifies the Malaysian EOI policy as moderate when compared with Asian NICs such as Korea. Governments usually have adopted either one of these two methods to promote EOI, or occasionally a combination of both - market orientation and government intervention.

Market orientation is a policy of getting the relative prices "right" by lowering tariffs and freeing exchange rates and the capital market. The resultant "right" prices will induce market forces (supply and demand) to determine what a country should export. The "right" prices also mean that it is equally profitable for companies to either export or to produce for the domestic market. Policies must be changed so that any bias towards ISI is corrected.

Government intervention usually gets prices "wrong" so that a false comparative advantage is created for certain sectors or industries. These advantages increase exports and market share. The instruments for this method are usually subsidies and incentives.

So far Malaysian industrialisation policy has mainly relied on market forces although some interventionist measures have been introduced (in particular the fiscal incentives). Malaysia is successful in EOI because of its relatively low wages. Multinationals set up operation to take advantage of this factor. However, with increasing wages not being matched by productivity, Malaysia may lose this comparative advantage. Trends in the electronic industry (Malaysia's largest manufacturing export) raise doubts about this sector's continued high growth[4]. Textile products, another important export, face protectionist threats from developed countries. These trends may mean that Malaysia cannot solely rely on its low wages as the source of comparative advantage.

The World Bank[5], in its analysis of Malaysia's short and long-term economic prospects, found that the reforms and adjustment programmes aimed at reducing market distortions have not produced significant effects. It suggests that the reforms should be rationalised and policies coordinated. Further reforms should be complementary. These reforms may take the form of privatisation, reduced government spending, lower subsidies, liberalised industrial licensing and lower corporate income tax and tariff rates.

Even if a country manages to get prices "right", will it be successful in its exporting efforts? Amsden[6] gave a few examples where it still did not work. The emergence of Germany or the US as industrial powers was based on superior technology and organisation and not on wages. Japan managed to end Lancashire's dominance of the world textile market with a combination of factors; better trading companies to procure raw cotton, more modern equipment and a more integrated process flow, albeit supported by lower wages.

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4 See World Bank, 1989. Malaysia: Matching Risks and Rewards in a Mixed Economy, The World Bank, Washington D.C. page 101. The future trend includes the shift towards more complex products and the shifting back of production from LDCs to developed countries.

5 World Bank(1989), Ibid.

6 Amsden(1989), op. cit, page 143

These examples made policy makers turn their attention to the alternative method of EOI, namely government intervention. A good example is Korea where a close relationship between government and business enables the government to demand a certain level of performance from business enterprises.

Malaysia did try to introduce a planned industrialisation process through the 1985 Master Plan which identified the products and sectors to be promoted and broad policy to achieve these goals. The government rationalised the incentive systems with a new package under the Promotion of Investment Act (1986). The Plan met with only limited success. There are no specific steps taken to implement the Plan because it is regarded only as an indicative plan.

Given the relationship between the Malaysian government and business enterprises, in particular the exporting ones, there may be a problem in opting for the intervention method. The success of Malaysian manufacturing exports lies with the foreign direct investment (multinationals). Because of their global links, their relationship with the government in host countries is looser than that of domestic companies. They are less dependent on the government. This Malaysian situation is thus very different from Korea's where foreign direct investment is not encouraged at all and exporting efforts are led by a few big domestic companies.

If government intervention is chosen a number of key decisions then need to be made, on how to implement it:

(i) How to introduce and monitor benefits - this is especially important in the case of foreign investment, in order to prevent abuse.

(ii) Which instruments to use and the level of protection/reward.

(iii) How to avoid distortion between factors of production, both between industries and between EOI and ISI.

(iv) What is the cost of subsidy.

Of these two methods of industrialisation, this study concludes that market orientation is more appropriate for Malaysia. Market orientation will have fewer distortions and will also need less supervision. Furthermore, there is a fundamental obstacle in adopting the interventionist method - the prominence of foreign investment in the Malaysian manufacturing sector. An added problem of the interventionist approach lies in identifying which sectors have the potential and should be promoted as export-oriented ones.

The market orientation method suggested is as follows:

(1) Liberalisation of trade policy. This study recommends the promotion of EOI; trade instruments are important tools to achieve this objective. International trade links the domestic economy with the world economy and allows countries to change the composition of their outputs to more efficient structures, by specialising according to comparative advantage. The efficient structure is the result of structural changes which take place when the economy responds to external demands. In addition, trade also provides access to critical industrial inputs and technology and expands markets for products.

(2) Reform of the fiscal incentives system. This suggestion does not totally follow the market orientation approach. In a pure market orientation approach, fiscal incentives should be abolished. It is felt that this approach should take into account the unique features of the Malaysian economy. As such, it is argued that this approach be modified and fiscal incentives retained. Furthermore, in the past the Malaysian government has succesfully used the fiscal incentives system to increase investment and to promote EOI. But some reforms are necessary in order to enhance their role in further promoting EOI.

Each of these policy areas will be discussed below.

8.4.1.1 Liberalisation of Trade Policy

Generally the trade policy that is considered more conducive to EOI is the less interventionist one , in other words neutral:

" A neutral framework is the one that does not discriminate between exportables and importables, between sales to domestic and export markets, or between tradables and nontradables. Liberal trade policies are those that reduce government controls and replace direct interventions (such as quantitative controls) with price mechanisms (such as tariff)"[7]

Four major trade instruments are usually used for reform; tariff, exchange rates, quantitative restrictions and direct export policy. The discussion on trade reform is focussed on the first two instruments because the third one is of minor importance since Malaysia imposes quantitative restrictions only on few items and the last one (direct export policy) is covered in the next section on fiscal incentives.

The movement toward greater tariff neutrality has three dimensions: (i) simplification and consolidation of tariff procedures, (ii) lowering of the average tariff level, and (iii) reducing the average tariff dispersion.

Complicated tariff procedures can only encourage rent-seeking or non-productive activities and will increase the cost of imports. A simplified procedure will no doubt make imports more accessible and cheaper and consolidation of a range of existing types of import charge reduces the administrative costs.

Government can reduce tariff in many ways: an equiproportional cut in all tariffs, an equiproportional reduction of the excess of each tariff over some target level, higher proportional reductions of higher tariffs, or some combination of these and other methods. One of the more common methods is the "concertina" approach. First, all tariffs above a ceiling are lowered to that ceiling; next, all

[7] Thomas,V. , and Nash, J., 1991. "Reform of Trade Policy: Recent Evidence from Theory and Practice", Research Observer, Vol. 6, No. 2, page 219.

tariffs above a new , lower ceiling are lowered to that ceiling, and so on. It is easier to cut a tariff (nominal rate of protection) than the effective rate of protection because of the difficulties in calculating the latter.

If the dispersion of tariffs is not reduced as the tariff average is reduced, the tariff structure may not become more neutral, in fact it can become more skewed. Indeed, a reform that reduces tariff on intermediate and capital goods but leaves intact those on final output could increase effective protection.

The Malaysian import duty procedure is not burdensome; beside the import duty, the other significant charge is surtax which is imposed on selected items. Thus the simplification and consolidation of tariffs is a not pressing problem. In the 1980s majority of the Malaysian imported items (about 70 per cent) have tariff level of 30 per cent or less. The Malaysian government has, in the 1980s generally reduced tariff rates. (Certain items continue to rise in tariff - cars, cigarettes and alcoholic drinks - and this may increase the tariff dispersion.) In general the Malaysian tariff rates are not high, therefore it is relatively easy for the government to reach the recommended level of 15 per cent[8]. The government must resist the temptation to increase the tariff dispersion by protecting some areas (heavy industries such as cement and steel). In fact, the existing high tariffs should be reduced to close the dispersion.

Another instrument for trade reform is the exchange rate policy. An over-valued real exchange rate erodes export competitiveness and its instability discourages investment and production. Tariff reduction is supposed to move resources to the export sector and to foster export growth, but an appreciating real exchange rate will probably retard this process. A low and stable real exchange rate is needed to ensure export growth and the success of trade reform.

In Malaysia the depreciating real exchange rate of the Ringgit since the

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[8] Levy and Nolan in their study of trade and foreign policy under imperfect competition found that the industrial sector of developing countries does not justify nominal tariff rates in excess of 15 per cent. See Levy, S. and Nolan, S., 1992. "Trade and Foreign Investment Policies under Imperfect Competition; Lessons for Developing Countries", Journal of Development Economics, 37.

second half of the 1980s coincides with a period of good economic performance. The Malaysian economy grew on average at 8 - 9 per cent per annum and exports at 30 per cent per annum for the period 1987-1990[9]. This "coincidence" suggests that the government should continue its present exchange rate policy of letting the market determine the exchange rate but at the same time making sure the the Ringgit does not appreciate sharply.

Does trade liberalisation that transforms ISI into EOI lead to higher economic growth and welfare? There is no definite answer. As shown by the varying experiences of countries that implemented trade reform,[10] countries such as Chile and Mauritius saw economic and export growth while others, for example Argentina failed. There are also countries such as Sri Lanka that experienced initial success but economic growth later stalled due to poor macroeconomic management and deteriorating external conditions. Hence no simple answer is available to the above question, because the success of trade reform does not depend entirely on the reform process itself but on many other related factors.

Comparison of liberalisation efforts of many countries indicates that some necessary initial conditions are required in the pre-reform environment[11]. Among them: political stability, low inflation, balance of payment equilibrium and no large fiscal deficit. Political stability is essential to withstand the possible negative outcome of the reform such as increased unemployment (albeit temporary). There must be low inflation in order not to jeopardise exports. The balance of payments must also be in equilibrium because if a large deficit exists, it may be exacerbated by increased demand for imports as a result of lower import duties. A fall in government revenue when tariffs are reduced may worsen fiscal deficits. In other words there must be macroeconomic and political stability before a country can embark on reformation of its trade policy. The success of

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9 Government of Malaysia (Treasury), Economic Report 1991/1992.

10 World Bank, World Development Report, 1987, pages 98-105.

11 Ibid, pages 108-109.

trade reform is also dependent on other changes such as liberalisation of the financial and domestic markets.[12]

There may be negative results of the trade reform such as increased unemployment in previously heavily protected industries, reduction in government revenue due to lower tariff rates and increased imports because they have been made cheaper by the lower tariff.[13] In Malaysia there are not many highly protected industries and so the unemployment effect is not expected to be significant. Furthermore the expected export growth and the ensuing employment should quickly compensate for that. Import duty and tax only constitutes about 12 per cent of the government revenue, and thus any drop would have little impact on government finances. The main worry is increased imports, as shown by their rise since 1990.[14] But this rise is mainly made up of imports of capital and intermediate goods which are expected to be translated into exports.

The above potential difficulties should not deter Malaysia from seeking EOI through trade reform; its average tariff level is moderate, it has a low real exchange rate, and there is macroeconomic and political stability. The reform should reduce the average tariff level and close the tariff dispersion.

8.4.1.2 Reform of Fiscal Incentives

The market orientation approach advocates minimum government intervention. Since the fiscal incentive system is widely used as an interventionist instrument, there is a need to refocus its role and in the process one cannot escape from the question of redundancy: Does Malaysia really need incentives to encourage investment? Indonesia, in 1985, abolished the incentive system and instead of a decrease in investment, it experienced a boom. Malaysia has relatively well developed infrastructure, a reasonably educated labour force *

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12 Ibid.

13 Greenaway, D. and Milner, C., 1991. "Fiscal Dependence an Trade Taxes and Trade Policy Reform", Journal of Development Studies, Vol. 27, No.3. ?

14 Economic Report, op cit, page 174.

and political stability; these should be sufficient to attract investment. Another argument for scrapping fiscal incentives is that government intervention may result in unbalanced economic growth. In addition, the intervention costs can be quite high.

However there are equally important reasons why fiscal incentives should be maintained. They are essential in guiding and encouraging the development of certain industries with growth potential such as resource-based or export industries. Without incentives these industries may not be able to realise their potential. Some quarters fear that if Malaysia does not offer incentives, there will be an out-flow of investment or no new investment will come, since many other LDCs offer similar facilities. Non-economic reasons are also important, in that fiscal incentives are seen to be a way of encouraging balanced participation in the economy by all races.[15] Furthermore, the suggested move towards liberal trade policy by reducing tariffs will mean there is less protection, which then makes measures to promote investment more necessary. Although the market orientation approach is suggested for Malaysia, the fiscal incentives are still necessary and therefore it is appropriate to examine their effectiveness in promoting EOI.

The Promotion of Investment Act (1986) can be split into two groups of incentives:

(i) General incentives given to selected (promoted) industries or activities (for example, pioneer status and investment tax allowance).

(ii) Specific incentives (for example, for exports and training).

The objective of the general incentives is to increase investment and these incentives, which are based on types of industry/activity, give partial or full relief from payment of income tax. From the list of promoted industries/activities, it is unclear whether these incentives are included to encourage export-oriented or domestic-oriented industries/activities.

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[15] See Usher,D., 1977. "The Economics of Tax Incentives to Encourage Investment in Less Developed Countries", Journal Of Development Economics, 4, page 146.

Promotion of exports is made in the second group where specific incentives are given to increase exports. The export incentives include: abatement of income, export credit refinancing scheme (ECR), double deduction of export credit insurance premiums and double deduction for promotion of exports.

The benefits offered by the first group are much more substantial than the second group; the full exemption from payment of income tax will definitely increase an investment rate of return more substantially than the short-term credit at a reduced rate of interest (ECR). The export incentives alone are not strong enough to induce investors to be exporters when there are market-neutral incentives which offer more attractive benefits. We suggest that the general incentives should be reformed to be more favourable towards exports. The scope of industries/activities that qualify for these general incentives should be widened, to include direct and indirect export industries not at present benefiting or to attach an export requirement, i.e a proportion of output must be exported. However, these improvements should be made in the framework of the GATT rules.

The specific export incentives should be extended and the benefits raised to make them more advantageous. The possible improvements include:

(1) Loosening the ECR requirement to allow lower value added and local content criteria. At present the requirements are 20 per cent and 30 per cent respectively. ECR works by lowering the cost of working finance, not the cost of capital investment per se. This will help exporters of both labour-intensive and capital-intensive goods. Indeed, with a lower added value threshold, more labour-intensive than capital-intensive establishments are likely to come into the scheme.

(2) Provide subsidised utilities to export manufacturers based on rates paid in other competing countries. Utilities should be charged to industry at rates that take into account rates in force in competing countries. If utilities are privatised and existing discounts to industry are removed, the government should mitigate this burden through its tax regime, perhaps by a double deduction for utilities.

(3) An existing export incentive that should be maintained is exemption of import duty on inputs for exporting industries.

The incentives directly linked to EOI are the Free Trade Zones (FTZ) and Licensed Manufacturing Warehouses (LMW). The FTZs are criticised because they produce no significant linkages with the rest of the economy except for employment. The costs of FTZs are high as the government has to provide land and infrastructure. Thus, not many FTZs have been set up recently.

The disadvantage of direct export incentives is that some of them are difficult to administer and can be open to abuse. Furthermore, they are increasingly threatened by countervailing measures imposed by some importing countries.

8.4.2 Employment Creation Through Variable Elasticity of Substitution and Relative Factor Price Changes.

The failure of LDC industrialisation in creating employment has been attributed to structural rigidity in their production techniques and distortion in the factor markets. The structural critics argue that labour absorption has been low because of limited possibilities of substitution between capital and labour. There are many explanations why this is so, among them : industrialisation is spurred by major foreign investors who tend to utilise the same production techniques as in their home country; the inclination of domestic producers to copy techniques existing in the developed countries and the absence of techniques suited to LDCs factor endowments. The low substitution possibility is reflected in the low elasticity of substitution between capital and labour.

The market critics on the other hand, stress the importance of relative prices in determining the amount of different factors employed. They argue that without the severe distortions introduced into the factor markets by government policy, there is no labour absorption problem. Tariff and fiscal incentives used to promote investment have made capital cheap. In the labour market, on the other hand, institutional requirements (wage policy) have increased the price of labour. The combined effect of the capital and labour market distortions have substantially increased the price of labour relative to capital.

For the structural critics, relative factor prices are of little importance. They believe that the combination of factors is solely decided by the availability of production techniques. Thus in a developing country without indigenous production techniques, the only available ones are those from the developed countries. These use the developed countries' factor proportions (capital-intensive ones). The initial estimates of the elasticity of substitution confirmed the arguments put forward by the structural critics[16]; the elasticities are found to be very low, hence no substitution. However later studies (both macro level econometric and micro level case studies)[17] show higher elasticities. Since substitution possibilities exist, the amount of factors employed could be influenced by their relative price. Therefore the two reasons for unemployment (structural and market rigidities) are not mutually exclusive. Winston[18] showed the relationship between elasticity of substitution and factor prices, namely only under very stringent conditions do factor prices lose their influence on factor substitution. Empirical evidence also showed that the use of capital and labour is responsive to relative prices[19].

The pertinent question is: What is the labour response to varying elasticity of substitution if factor prices are changed? We will use the results obtained in this thesis concerning Malaysian manufacturing elasticity of substitution and factor price distortion to answer this.

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16 see Eckaus, R. S., 1955. "The Factor Proportions Problems in Underdeveloped Countries", American Economic Review, 45.

17 see for example Behrman, J. R, 1972. "Sectoral Elasticities of Substitution between Capital and Labor in a Developing Economy : Time Series Analysis in the Case of Postwar Chile", Econometrica, Vol. 40, No. 2, March. and Bhalla, A.S., ed., 1981. Technology and Employment in Industry : A Case Study Approach, (Geneva, International Labour Office).

18 Winston, G. C., 1974. " Factor Substitution, Ex Ante and Ex Post", Journal of Development Economics, 1, page 161.

19 Morawetz, D., 1974. "Employment Implication of Industrialisation in Developing Countries : A Survey", Economic Journal, No.84, September. and Bruton, H.J., 1972. "The Elasticity of Substitution in Developing Countries", Research Memorandum No. 45, Centre for Development Economics, Williams College.

This thesis concludes that elasticity of substitution exists in the Malaysian manufacturing sector. The elasticity ranges from a low of 0.5 to a high of 1.5. The thesis also shows that factor markets are distorted, especially the capital market. Government policy, in particular their fiscal incentives, has reduced the relative cost of capital. On the other hand the cost of labour has increased. The findings indicate because there is flexible elasticity (with a value of 1.0 or greater) that it is possible to augment labour usage if factor prices are changed to represent their real prices. Thus, industries with flexible elasticities can use the optimal factor combination that minimises cost and matches the prevailing factor endowment .

In order to quantify the employment potential, this study uses a CES function to calculate the labour coefficient under a distortion-free condition and then compares it with the result when distortion exists. This will be followed by a discussion on the policy that should be adopted to realise this potential.

The CES function is of the form[20]:

$$Q = \gamma [\delta K^{-\theta} + (1-\delta) L^{-\theta}]^{-1/\theta}$$

which can be rewritten as,

$$q = \gamma [\delta k^{-\theta} + (1-\delta)]^{-1/\theta} \qquad (1)$$

where $q = Q/L$ and $k = K/L$

Equation (1) can be simplified as:

$$q = \gamma \delta^{-1/\theta} [k^{-\theta} + \frac{(1-\delta)}{\delta}]^{-1/\theta} \qquad (2)$$

[20] The full derivation of the labour coefficient of the CES function is shown in Appendix D

Let $\gamma\,\delta^{-1/\theta} = Z$

$\frac{(1-\delta)}{\delta} = B$

then equation (2) becomes,

$$q = Z\,[\,k^{-\theta} + B\,]^{-1/\theta} \tag{3}$$

Using the first-order conditions for profit maximisation which are

$$\frac{\partial Q/\partial L}{\partial Q/\partial K} = \frac{(1-\delta)\;L^{-(1+\theta)}}{\delta\,K^{-(1+\theta)}} = w$$

Equation (3) can be simplified to become:

$$B\,k^{(1+\theta)} = w \tag{4}$$

$$k = \left(\frac{w}{B}\right)^{1/(1+\theta)} \tag{5}$$

where $w = W/R$

W = Wage

R = Rental

Let w_f = a distortion-free wage-rental ratio

w_d = the actual wage-rental ratio

d = the proportionate distortion

Then, $w_d = w_f\,(1+d)$

Combining equations (3) and (5),

$$q = Z\,(\,[\left(\frac{w}{B}\right)^{1/(1+\theta)}]^{-\theta} + B\,)^{-1/\theta}$$

$$q = Z\,\{B^{\theta/(1+\theta)}\}^{-1/\theta}\,[w^{-\theta/(1+\theta)} + B^{1-\{\theta/(1+\theta)\}}\,]^{-1/\theta} \tag{6}$$

Therefore, equation (6) under distortion-free and actual conditions are:

$$q_f = Z\,\{B^{\theta/(1+\theta)}\}^{-1/\theta}\;[w_f^{\;-\theta/(1+\theta)} + B^{1-\{\theta/(1+\theta)\}}]^{-1/\theta}$$

$$q_d = Z\,\{B^{\theta/(1+\theta)}\}^{-1/\theta}\;[w_f^{\;-\theta/(1+\theta)}(1+d)^{-\theta/(1+\theta)} + B^{1-\{\theta/(1+\theta)\}}]^{-1/\theta}\,.$$

Comparing the two conditions,

$$q_n = \frac{q_f}{q_d} = \frac{[w_f^{\;-\theta/(1+\theta)} + B^{1-\{\theta/(1+\theta)\}}]^{-1/\theta}}{[w_f^{\;-\theta/(1+\theta)}(1+d)^{-\theta/(1+\theta)} + B^{1-\{\theta/(1+\theta)\}}]^{-1/\theta}} \tag{7}$$

$q= (Q/L)$ is output per unit of labour. Therefore if one is interested in labour coefficient, i.e labour per unit of output, the reciprocal will be used instead; $(L/Q) = 1/q$

If we are interested in changes in labour coefficient when distortions are eliminated, the reciprocal of q_n should be used; labour coefficient = $1/q_n$ = $1/(q_f/q_d) = q_d/q_f$

Therefore;

$$\text{The labour coefficient} = \frac{[w_f^{\;-\theta/(1+\theta)}(1+d)^{-\theta/(1+\theta)} + B^{1-\{\theta/(1+\theta)\}}]^{-1/\theta}}{[w_f^{\;-\theta/(1+\theta)} + B^{1-\{\theta/(1+\theta)\}}]^{-1/\theta}} \tag{8}$$

The CES elasticity of substitution is defined as,

$\sigma = 1/(1+\theta)$ and thus equation (8) becomes,

$$\text{The labour coefficient} = \frac{[w_f^{\;-\sigma\theta}(1+d)^{-\sigma\theta} + B^{1-\sigma\theta}]^{-1/\theta}}{[w_f^{\;-\sigma\theta} + B^{1-\sigma\theta}]^{-1/\theta}} \tag{9}$$

These estimates of d (proportionate distortion) used in equation (9) are obtained from chapters 2 and 3 and they are summarised as follows:

Selected policies are:	Change in Cost of Capital (%)
1) Accelerated Depreciation Allowance (ADA) in the Promotion of Investment Act 1986 (PIA) and valid for 3 years	- 9
2) Pioneer Status Tax Holiday in the PIA and valid for 5 years	- 20
3) Pioneer Status Tax Holiday in the PIA and valid for 10 years	- 47
4) Investment Tax Allowance in the PIA and valid for 5 years	- 40
5) Trade policy (tariff and exchange rate) For trade policy, we take the average changes over the period (1979-1982)	+0.3

6) Real wage is estimated to increase by 2.4% per annum.

Five policies were selected as the ones that distort the capital market; accelerated depreciation allowance, two pioneer status tax holiday incentives (5-year and 10-year), investment tax allowance and trade policy. For each of these policies, the user's cost of capital was calculated and compared with the cost under a neutral regime. The first four policies have varying periods of applicability whereas the fifth policy (trade) was an annual average.

The real wage annual increment was used as proxy for labour market distortion. This is not the most appropriate measurement but it was chosen because there is no direct government intervention, (for example there is no minimum wage policy) and therefore distortions come mainly from the slowness of the labour market in responding to market forces. Thus the annual wage movement is regarded as a reasonable approximation for the distortions. Government intervention comes indirectly through institutional requirements such as the Employee Provident Fund (EPF) contributions and termination benefits, but their effects are difficult to quantify. Other measures of distortion

Table 8.4

Percentage Distortion in Labour and Capital Costs from Selected Policies

Policy	Increase in Labour Cost	Reduction in Fiscal Incentives	Increase Trade Policy	Combined increase in Wage–Rental Ratio	d=averaged increase in Wage-Rental Ratio
	Percentage				
1) ADA (3 years)	+ 7.2	– 9	+ 1	17	5.6
2) Pioneer Status Tax Holiday (5 years)	+ 12	– 20	+ 1.5	37	7.4
3) Pioneer Status Tax Holiday (10 years)	+ 24	– 47	+ 3	121	12.1
4) Investment Tax Allowance (5 years)	+ 12	– 40	+ 1.5	82	16.4

Note: Since the fiscal incentives have different validity periods, the combined distortions (wage-rental ratios) are averaged over the number of years the policy is applicable in order to give a standardised effect.

use the difference between overall wage level and the shadow price of labour[20] while some such as Tyler[21] confine the labour market distortion to the difference between the minimum wage of unskilled workers and its shadow price.

The combined effect of labour and capital market distortion is shown in table 8.4.

A producer is assumed to be able to select any one of the four fiscal incentives. However, he has no choice but to bear the cost of labour and capital

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[20] Krueger,A.O., Lary, H. B., Mason, T. and Akrasanee, N., eds., 1981. Trade and Employment in Developing Countries : Individual Studies, Vol. 1, (Chicago, University of Chicago Press for the National Bureau of Economic Research).

[21] Tyler, W. G., 1974. "Labour Absorption with Import-Substituting Industrialisation : An Examination of Elasticities of Substitution in the Brazilian Manufacturing Sector", Oxford Economic Papers, Vol.26, No.l, March.

arising from the trade policy. Hence the total distortion a producer has to bear is any one caused by the fiscal incentive plus another two caused by labour and trade policies. The averaged distortions in table 8.4 are then used in equation (9) to calculate the changes in labour coefficient.

The values of other parameters in equation (9) are as follows:

1)* w = a distortion-free wage-rental ratio = 97.6

This value is the Malaysian 1970 wage-rental ratio calculated by Nagaraj[22] and considered free of distortion. Although the first incentive scheme was introduced in 1968 its effect would not become significant for a few years after that.

Table 8.5

Estimated Increases in Labour Coefficient Assuming that Factor Market Distortions are Eliminated

Policy	Estimated d(%)	% Increase in Labour Coefficient if the Elasticity of Substitution is:				
		0.5	0.7	1.0	1.2	1.5
1) ADA (3 years)	5.6	0.4	1.3	3.9	5.8	8.3
2) Pioneer Status tax holiday (5 years)	7.4	0.4	1.7	5.1	7.7	11.1
3) Pioneer Status tax holiday (10 years)	12.1	0.7	2.7	8.3	12.6	18.3
4) Investment Tax Allowance	16.4	0.9	3.6	11.2	17.1	25.1

2) δ = distribution parameter = 0.7

This value is derived from table 1.7 in chapter 1 which shows the distribution of value added between wage and non-wage components.

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22 Nagaraj, S., The Determinants of Investment Behaviour in West Malaysia, M.Ec. thesis submitted to the Faculty of Economics and Administration, University of Malaya, unpublished.

3) σ = elasticity of substitution

Selected estimated values from chapter 5 are used to represent the Malaysian elasticity of substitution and they range from 0.5 to 1.5. Low values (0.5 and 0.7) are included because firstly there are product groups with such elasticity and secondly we want to compare the quantum of employment generated by both inflexible and flexible substitution.

Appendix D shows that equation (9) is a well behaved one. The labour coefficient remains almost invariant to a range of values for w and δ. The significant changes come from σ and d. This is as it should be, and indicates the influence of elasticity of substitution and factor market distortions on the labour coefficient.

Table 8.5 gives the percentage increase in the demand for labour under various values of σ and when distortions caused by a number of government policies are removed. These changes can be analysed firstly by the elasticity and secondly by the policy.

The results confirm the long-held view that if there is no substitution then changes in the factor proportion will not take place. Therefore even if factor market distortions are eliminated, no significant employment is generated. To analyse the effects of varying elasticities, comparisons of labour coefficient are made for a particular incentive, say the ADA. When elasticity is 0.5, the labour coefficient will only increase by 0.4 percent, which means hardly any additional labour can be absorbed. On the other hand, when substitution possibilities exist (for example σ = 1.5) employment will rise by 8.3 per cent if factor market distortions are removed. Based on the 1991 manufacturing employment of 1.4 million[23], 8.3 per cent represents about 120,000 jobs. Substantial employment can still be created (56,000 jobs) even though the elasticity is of the Cobb-Douglas type, i.e 1.0. The above results show that the labour absorption increment is proportional to the increase in the elasticity of substitution.

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[23] Economic Reports, op. cit., 1991 /1992.

The effect of variable elasticity of substitution on employment potential can be linked to the establishments' market-orientation. Export-oriented establishments are found to have larger elasticities than domestic-oriented ones and thus they can create more employment than the latter. However owing to the lack of manufacturing export-sector and import-sector employment data, we are unable to quantify the jobs that can be generated for each of these subsectors.

The level of distortion caused by different incentives also plays an important role in creating employment. The Investment Tax Allowance causes the largest distortion and if it were to be removed, about 360,000 jobs would be created (when $\sigma = 1.5$). The second largest distortion is that of the 10-year Pioneer Status Tax Holiday, while the smallest one is from the ADA.

It has been shown above that flexible factor substitution responds to factor price changes. The process works through four mechanisms that affect increment to production and the existing capital stock:

1) If different products are made with processes that have different factor proportions, the choice of what to produce should be influenced by relative factor prices. If labour is relatively cheap compared to capital, producers will produce labour-intensive products, and more labour will be used.

2) After the decision has been made to produce a particular product, there are many alternative ways to produce it. Which of these is deemed best will depend on relative factor prices; relatively low priced labour will mean a labour-intensive technique.

3) Even within a given production technique, substitution can still take place. This is called "instantaneous substitution". For example: two physically identical plants face different relative factor prices. Although they are identical, these plants can use different size crews to produce different rates of output. The plant with the lower price of labour uses more labour on the same amount of capital stock and produces more output.

4) If a production process is not fully utilised, the lower cost of labour enables the producer to increase the utilisation by increasing the labour size.

The discussion of the quantum of potential employment and the substitution mechanism helps to indicate what policy is to be adopted. A policy that affects the wage-rental ratio must also reflect the country's factor supply. The Malaysian government's intervention in capital markets is done mainly through the fiscal incentive system. Of course, there are also bolder suggestions to stop fiscal incentives completely, and the counter arguments on why they are needed (as discussed in section 8.4.1). If one assumes that the government will continue with incentives, then it should at least remove capital market distortions by withdrawing measures that relate directly to capital. Earlier fiscal incentives (the Investment Incentive Act 1968) used the level of investment as the decision criterion. By introducing the Promotion of Investment Act 1986, the government moved in the right direction by abolishing this criterion and now incentives depend on the types of activity that the government wants to promote. However, the quantum of benefits under Investment Tax Allowances still depend on the level of investment. This incentive should be abolished. Then the main incentive will be the pioneer status which is based on types of industry/activity.

In the 1968 incentives package, the government introduced incentives based on labour but they were not widely used. A labour subsidy programme where the government pays a subsidy to producers based on the number of workers is cumbersome and requires a financial commitment from the government which it may not be willing to undertake. Two separate incentives may be introduced or expanded:

(i) A new abatement of income tax for labour. On a sliding scale, a proportion of adjusted income may be abated from tax depending on the number of employees. The scale may reach a maximum of 30 per cent if the company has more than 500 workers.

(ii) Existing training allowances for workers may be increased.

Relative prices can also be changed by trade policy, through its influence on the cost of capital. Presently, tariffs are imposed on imported machinery which means the price of capital is higher than the world price. However, many firms especially export-oriented ones receive import duty exemption. The lower cost of capital will encourage exporting firms to use capital-intensive production techniques. Earlier analysis (section 8.1) has shown that export-oriented firms can generate more employment than import substituting ones and thus they are expected to be the source of more jobs. Exemption from import duty may then operate in a way to nullify the labour absorption capacity of exporting establishments.

In other words tariffs, fiscal incentives and import duty exemption alter the cost of capital but not in a similar direction; tariff raises costs, fiscal incentives reduce them for selected firms and import duty exemption creates a cost differential between exporting and domestic firms. To be effective, policies should not give conflicting signals to manufacturers. Instead the tariff level on machinery should be reduced, its import duty exemption withdrawn and the fiscal incentives changed from capital subsidisation to more neutral ones. The total effect of these coordinated policies should then produce a real price of capital.

Government labour policy also affects the relative factor prices. Currently the government intervenes indirectly through institutional requirements and this level of intervention should be maintained. If the government increases its intervention, say by augmenting the EPF contributions, the result will be higher labour costs. Although in the EPF example, the purpose may be to increase saving which is then used for development but the "side effect" has been to make labour more expensive.

The slowness of wage response to market forces has been attributed to market rigidity. The wage setting mechanism of the private sector does not react quickly to a firm's performance and the public sector gives automatic annual increments. The public sector has recently introduced a new "flexible" salary scheme[24], however, it is too early to see its full effect. Suggestions that a

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24 The scheme introduced in January 1992 gives different rates of increments to workers; zero increment for the lowest 5 per cent, multiple increments for the excellent performers and for others the normal rate of increment.

significant proportion of the private sector pay should be linked to the current economic health of the firm have been criticised. There would have to be agreed, objective and checkable performance measures. Reform of the wage setting mechanism is slow and difficult.

Ideally, if the government adopted a policy to eliminate factor market distortions, more labour will be employed because there is flexible factor substitution. But this optimism has many limitations:

1) Variation in product mix in response to relative factor price changes assumes very elastic foreign demand for possible labour intensive LDC exports. But for many labour-intensive products there exist quotas and other non-tariff barriers (such as the multi-fibre agreement for textiles) that restrict access to developed countries, and these may have a bigger influence on the product mix than do factor prices. Therefore, other reforms are needed, as well as that of factor prices, if the output-mix is to match the country's comparative advantage. In other words there are many things beside factor prices that determine the choice of a product mix.

2) The range of production techniques that may be used to produce an item is not known with any certainty. The main unknown is that even if relative factor prices are changed to reflect factor supply, there may be no production technique that matches the factor proportions.

3) Assuming there are many substitutable production techniques to produce a product, access to them may vary enormously amongst producers because of the differentiated information cost. Since the market for information is very imperfect, the price for the same unit of technological information can differ enormously amongst producers.

4) Producers may not always be rational in the strictly economic sense. Almost always, decisions made by producers are not solely based on economics. For example, in choosing a production technique, engineers will have to evaluate; present equipment, order lead times, experience in existing and new methods,

quality and reliability. Cost considerations will be also taken up but only after engineers' evaluation has eliminated many of the theoretically available options. Furthermore, monopolistic and oligopolistic producers do not have to choose the cheapest production technique in order to be profitable.

5) The instantaneous substitution mentioned earlier is rare and the utilisation rate is more often than not determined by demand. Thus substitution in response to price changes through these two mechanisms is limited.

In conclusion, it is possible to increase labour usage in Malaysian manufacturing when relative prices are changed, because factor substitution exists. Government policy should aim to make factor price correspond with factor endowment, despite the difficulties in achieving this goal.

Appendix A

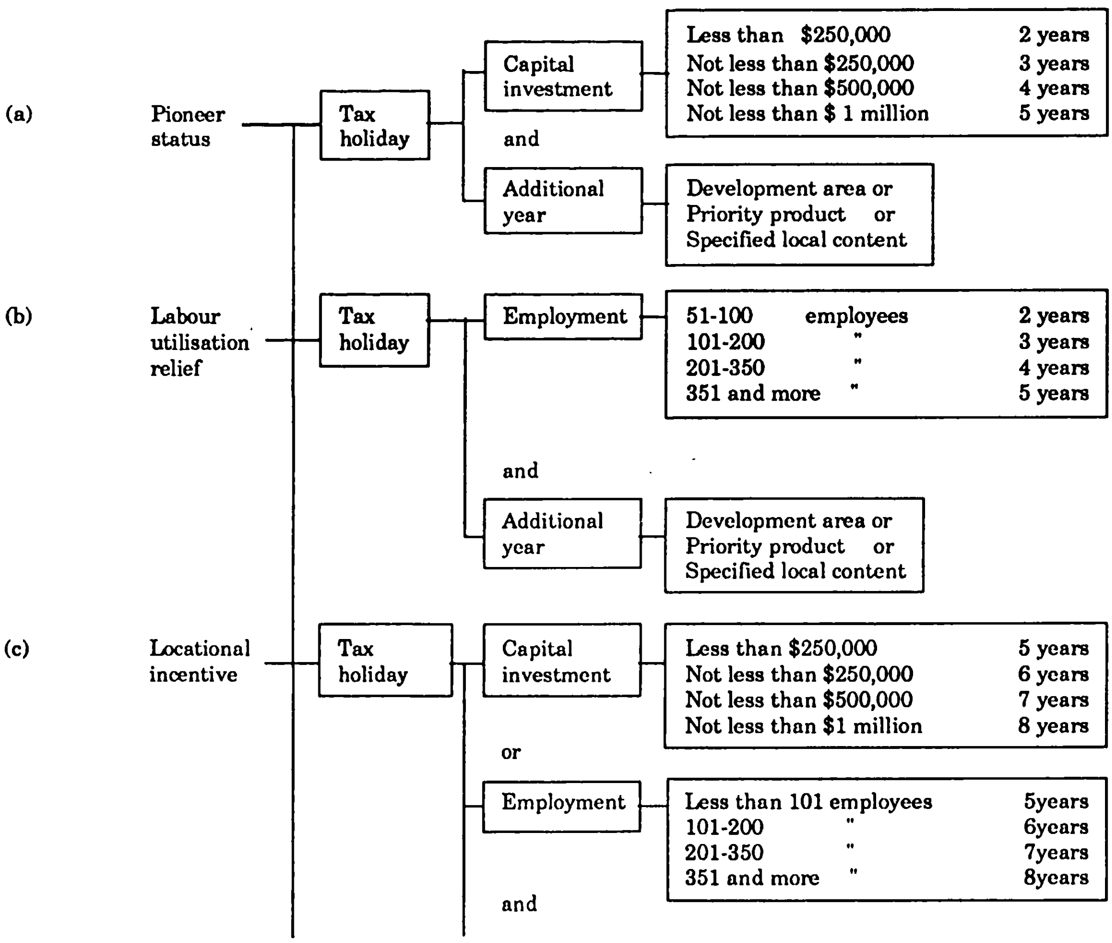
Changes to Fiscal Incentives from 1957 to 1988

1957 Report of the Industrial Development Working Party recommended tax concessions for pioneer companies

1958 Pioneer Industries Ordinance
2 years income tax exemption given to any new manufacturing establishment approved as "pioneer" company
Exemption period extended to 3 years for a fixed capital expenditure of more than $100,000 but less than $ 250,000
Extended to 5 years if more than $250,000

1965 Pioneer Industries Act
Applications for incentives approved by the Federal Industrial Development Authority (FIDA). FIDA was later changed to Malaysian Industrial Development Authority (MIDA).
Additional 1 year tax exemption for fixed expenditure between $250,000-$500,000
Additional 2 years exemption between $500,00- $ 1 million
5 years exemption if investment exceeds $1 million

1968 Investment Incentives Act(IIA)



- Additional year — Priority product or Specified local content

For (a)
(b)
(c)

- Dividends — Dividend paid out of tax-free profits by shareholding company to shareholder, where shareholder is a company, exempted from tax in the hands of the shareholder
- Capital investment — Capital expenditure on existing assets deemed to have been incurred on the day following end of tax relief period and capital allowances calculated accordingly
- Losses — Where losses have been incurred during the tax relief period, the net amount of such losses can be carried forward and offset against income in the post relief period

(d) Investment Tax Credit

- Tax credit in addition to annual depreciation allowance of not less than 25% of capital expenditure incurred on factory, plant, or machinery for approved project
- Additional 5% — Development Area or Priority Product or Specified Local Content
- Tax relief could be carried forward in case of loss or insufficient income until fully utilised against subsequent profits
- Dividends paid out of tax free profits exempted from tax in the hands of share holders ("tax spared")

(e) Export Incentives

- Deductions for promotion overseas
- Accelerated depreciation allowance — Only resident companies qualify Must export 20% by value Given only in respect of capital expenditure incurred on modernisation. Rate- 40% per annum
- Export allowance — Size of deduction:
  (i) For a company already exporting
  (a) x x 2% plus
  (b) $(x - y)$ x 10%
  (ii) For a company which is exporting for the first time: x x 12%

  x = exports in the basis period
  y = exports of the year in which the company was last exporting

1971 Increased Capital Allowance

For projects that were not eligible under Pioneer Status or Investment Tax Credit Allowance. If qualified, a company was entitled to a 40% annual tax allowance on building expenditure.

1971 Free Trade Zone Act

Inputs were freely imported in Free Trade Zones

Full exemption from surtax and customs duty if imported components were not manufactured locally or if local substitutes were not of acceptable quality or price. For duty drawback, applicant had to bear financial burden of paying the customs duty first and then wait for the rebate when goods were reexported.

1975 Licensed Manufacturing Warehouse (LMW).

Allowed a firm to produce or assemble for export under customs bond. These facilities were established in those areas where the establishment of a FTZ was neither practical nor desirable. Incentives available were similar to those for the FTZ , but subsidised infrastructure was not available.

1975 Industrial Coordination Act (ICA)

All manufacturing establishments had to apply for manufacturing licences unless the establishments employed less than 25 full-time workers and had issued capital of less than $250,000

1977 Export Credit Refinancing (ECR)

Provided export credit at preferential rates of interest for working capital as well as credit to foreign buyers. Minimum amount was $20,000 and the maximum was $3 million. The maximum amount should not exceed 50% of total export contracts when the refinancing is for working capital. Post-shipment financing facilities were also provided at concessionary rates of interest.

1981 Depreciation Allowance

Plant and machinery were previously eligible for an initial 20% and an annual allowance on the reducing installment basis. This depreciation allowance calculation was now amended to a faster rate (straight line method) in order to encourage renewal of machinery and new investment

1985 Amendments to the ICA

A manufacturing license was only required for a company with shareholders' funds of $1 million or more or employing at least 50 persons. License requirements were also relaxed for a company expanding its production capacity or diversifying its domestic and/or export market

1986 The 1986 Acts described below are still in force and thus represent substantially the full range of incentives presently available:

(1) Promotion of Investment Act (PIA)

With the introduction of the PIA, the IIA(1968) was repealed.

(a) Pioneer Status

Tax relief is given for a fixed period of 5 years to companies intending to produce promoted products or to engage in promoted activities. The relief period commences from the first production day and is given irrespective of the size of the investment. An additional product or activity can qualify for a second pioneer status.

(b) Investment Tax Allowance (ITA)

Qualifying capital investment incurred within 5 years from the date of approval is is given tax credit. No minimum amount as in IIA (1968). Dividend income in the hands of shareholders is tax exempt. This incentive is only for companies intending to produce promoted products or to engage in promoted activities.

(c) Abatement of Adjusted Income (AAI)

This incentive is intended to encourage the export of locally manufactured products, the development of designated areas and the development of small-scale industries. Dividends paid out of the tax exempt income are exempt from tax in the hands of shareholders.

(c) (i) Abatement of Adjusted Income for Export

When a resident company exports directly or through any agent any product manufactured in Malaysia, the adjusted (taxable) income of the company for that year of assessment is abated at the following rates:

- 10% of the value added of the products exported
- 5% of the value of Malaysian materials incorporated in the manufacture of the products exported
- 5% of the value of indigenous Malaysian materials which are incorporated in the manufacture of the products exported

(c) (ii) Abatement of Adjusted Income for Location For resident companies located in designated promoted industrial areas, an abatement of 5% of the adjusted income is granted for a minimum period of 5 years

(c) (iii) Abatement of Adjusted Income for Small-Scale Industries. Small-scale manufacturers are eligible for an abatement of 5% of the adjusted income for a period of five consecutive years.

(c) (iv) An abatement of 5% of adjusted income is granted to a manufacturing company which complies with the government's policy on capital participation or employment on or after 1.1.1986(excluding those which had complied before 1.1.1986).

(d) Accelerated Depreciation Allowance

This allowance is in the form of an initial allowance of 20% and an annual allowance of 40%. This incentive is valid up to 1989.

(e) Reinvestment Allowance

This incentive is given to those existing manufacturing companies undertaking expansion and/or diversification which are not enjoying any form of tax incentive. This tax allowance equals 25% of the expenditure on plant, machinery and industrial buildings incurred, and is valid up to 1989.

(f) Export Credit Refinancing Scheme(see 1977 above)

The scope of this scheme is to assist not only exporters but also suppliers of those inputs which make the exports possible. Measures include widening the range of exports eligible for refinancing, lengthening the tenure of credit and strengthening the pre-shipment facility to provide greater financial support at the production level.

(g) Double Deduction of Export Credit Insurance Premiums

The premium paid for export credit insurance is allowed as double deduction in the tax computation.

(h) Import Duty on Raw Materials

Customs duties on a number of raw materials not produced in the country are reduced to a uniform rate of 2%. Also manufacturers are allowed to use bank guarantees in lieu of payment of import duties to overcome delays in getting approval for customs duties.

(i) Double Deduction for Promotion of Export

Certain expenses incurred by resident companies for the purpose of seeking opportunities for export of products manufactured in Malaysia are eligible for double deduction.

1986 (2) Liberalisation of Foreign Equity Participation

The government introduced the New Economic Policy in 1970 with the purpose of restructuring the economic ownership pattern. This policy requires that 30% of equity should be in the hands of Bumiputera (Malay) Malaysians, 40% owned by non-Bumiputera Malaysian and 40% by foreigners. The employment pattern also should reflect the racial composition of the population. The foreign equity ownership requirements are relaxed for the following activities:

(a) Export-oriented projects;

- exporting 80% or more, up to 100% foreign equity ownership is allowed irrespective of whether or not the company's products compete with products presently being produced locally for the domestic market.
- exporting 51-79%, foreign equity ownership is allowed up to 51%. Higher foreign equity ownership of up to 79% can be considered in special circumstances. These circumstances depend on factors such as level of technology, spin off effect, location, value added and utilisation of raw materials and components.

(b) Domestic-oriented projects;

- exporting between 20-50%, foreign equity ownership is allowed between 30-51%, depending upon similar factors as mentioned above.
- exporting less than 20%, foreign equity ownership is allowed up to 30%.
- high technology or priority products, foreign equity ownership is allowed up to 51%.

(c) Projects involving non-renewable resources

Foreign equity ownership of up to 100% is allowed. The percentage is determined according to specified criteria.

1986 (3) Amendments to the ICA

Level of exemption is raised to shareholders' funds of $2.5 million or employing 75 persons. The new level of exemption is also applicable to expansion and/or diversification activity.

1986 (4) Amendments to the PIA

(a) Pioneer status

- the tax relief] period of a pioneer company is extended for a further 5 years. This extension is only available to certain promoted products or activities on condition that :
  - fixed assets at the end of the 5-year period reaching at least $25 million, or
  - employment level reached 500 full-time paid Malaysian workers, or
  - other requirements specified by the Minister of Trade and Industry

- For a pioneer company diversifying into the manufacture of an additional promoted product or engaged in another promoted activity, a separate pioneer status for the additional product or activity will be granted.
- Any loss suffered by a pioneer company in non-pioneer years will be deducted in determining the amount of exempt profits available for distributing tax exempt dividends.

(b) Investment Tax Allowance

- ITA is mutually exclusive with Pioneer Status for a product or activity.
- An approval can be granted retrospectively from a date not earlier than 5 years from the date the application is received.
- A company can opt to either continue with the ITA until its

expiry date or surrender it and claim the Abatement of Adjusted Income or Export Allowance.

(c) Abatement of Adjusted Income

- The AAI given on the basis of value added and the usage of Malaysian materials is abolished and replaced by an AAI at a rate equivalent to 50% of export sales in relation to total sales. The AAI at the rate of 5% on the value of indigenous Malaysian materials used is retained.
- An AAI of 5% which was given to small scale companies is extended to all manufacturing companies which comply with the government's policy on capital participation or employment.
- AAI will no longer be given where products which have been exported are subsequently being reexported to Malaysia.

(d) Export Allowance

Export allowance of 5% on the FOB value of the products exported is extended to traders in respect of products manufactured in Malaysia. The provision on reexporting such products back to Malaysia applies in this case as in the AAI.

(e) Export Credit Refinancing Scheme

- Products with a value added of at least 20% and which incorporate a minimum 30% local raw materials are eligible for ECR facilities.
- The administrative limit to access by exporters /manufacturers to the ECR facilities is raised from $3 million to $5 million per exporter/manufacturer. The maximum of $10 million per exporter/manufacturer is abolished.
- The period of refinancing for certain primary goods is extended from a maximum of 3 months for pre- and post-shipment

facilities to 120 days and 180 days respectively.

(f) Reinvestment Allowance

A tax allowance of 40% of capital expenditure is allowed for the purpose of expansion. This allowance is valid until 31.12.1990.

1986 (5) Double Deduction of Approved Training

Double deduction is allowed for operational expenses incurred by the private sector on approved training

1986 (6) Liberalisation of foreign equity ownership

The guidelines announced in January 1986 were further relaxed:

- A company which exports 50% or more of its products is permitted to have up to 100% foreign equity
- A company which employs 350 or more full time Malaysian workers is permitted to have up to 100% foreign equity.

1988 Companies that apply for Pioneer Status after 21.10.1988 have to utilise capital allowances during the pioneer period. Capital allowances not utilised will not be allowed to be carried forward into post- pioneer period Losses unabsorbed during the pioneer period will not be allowed to be carried forward to the post-pioneer period. The Accelerated Depreciation Allowance incentive which is due to expire at the end of 1988, will not be extended.

Appendix B

U.S - Malaysian Real Exchange Rates from 1963 to 1987

Year	1$US = Malaysia Ringgit
1963	2.12
1964	2.16
1965	2.17
1966	2.20
1967	2.17
1968	2.35
1969	2.47
1970	2.57
1971	2.49
1972	2.42
1973	2.02
1974	1.80
1975	2.11
1976	2.13
1977	2.01
1978	1.93
1979	2.06
1980	2.22
1981	2.25
1982	2.34
1983	2.35
1984	2.44
1985	2.52
1986	2.74
1987	2.68

Appendix C

Survey Questionnaire.

The objective of the questionnaire is to distinguish between EOEs and DOEs characteristics and to highlight each of the establishment employment generation capability. This capability is reflected in two ways; firstly the establishment ability to absorb labour and secondly the establishment viability. Information obtained concerning the percentage of output exported will be the basis for separating the product groups (at 5 digit level of Malaysian industrial classification) into EOEs and DOEs.

The characteristics of interest can be broadly grouped into:

1) Organisational structure.
2) Products.
3) Factors of production.
4) Competitiveness.
5) Protection and government assistance.

The information obtained is in two forms; quantitative and qualitative. The quantitative data mainly looks at the value and volume of production, fixed assets, input, labour and factors intensity. The qualitative data is used for the appraisal of competitiveness, such as productivity, technology, protection and change in market orientation.

Since the survey was carried out at two different periods(1979 and 1985), we can also compare EOEs and DOEs performance.

The data generated by the questionnaire is discussed in greater detail below:

(i) Organisation of the establishments.
Questions in this first category focus on the basic organisational structure such as legal status, year of commencement and location.

(ii) Source of fund.

Data obtained will give the pattern of ownership.

(iii) Output.

a) Types of products - there are three main groups for electrical/electronics (consumer, component and industrial/commercial products) and four for textiles (fibre manufacturing, fabric manufacturing, wearing apparel and other textile products).
b) Value and volume of production.
c) Factors affecting the demand and choice of products. Questions are also asked about establishments original market for products; i.e whether export or domestic market.

(iv) Value and type of fixed assets.

(v) Marketing of products.

Questions in this category try to identify the proportion of output that is exported, change in market orientation (if any) and reason for such a change.

(vi) Input

Questions are asked about the types of input used and whether any duty is paid on these imported inputs. Knowledge about duty free input will supplement the questions on government assistance.

(vii) Labour

a) Breakdown of categories of workers will identify the proportion of skilled and unskilled labour.
b) Size of the labour force.
c) Wages rates and factors that determine changes in wage rates.

(viii) Production and technology

a) Choice of techniques.
b) Capacity utilisation.

(ix) Auxiliary relationship - to identify the existence of backward and forward linkages.

(x) Assistance given by the government. Questions are restricted to incentives and financial assistance.

Appendix D

Changes in Labour Coefficient Under Variable Elasticity of Substitution and When Factor Market Distortions are Eliminated.

The CES function is:

$$Q=\gamma\left[\delta K^{-\theta}+(1-\delta)L^{-\theta}\right]^{-1/\theta}$$

$$\frac{Q}{L}=\frac{\gamma}{L}\left[\delta K^{-\theta}+(1-\delta)L^{-\theta}\right]^{-1/\theta}$$

$$=\frac{\gamma}{L}\left\{L^{-\theta}\left[\delta\frac{K^{-\theta}}{L^{-\theta}}+(1-\delta)\right]\right\}^{-1/\theta}$$

$$=\frac{\gamma}{L}\left\{L^{-\theta}\left[\delta\left(\frac{K}{L}\right)^{-\theta}+(1-\delta)\right]\right\}^{-1/\theta}$$

$$=\frac{\gamma}{L}\left(L^{-\theta}\right)^{-1/\theta}\left[\delta\left(\frac{K}{L}\right)^{-\theta}+(1-\delta)\right]^{-1/\theta}$$

$$=\gamma\left[\delta\left(\frac{K}{L}\right)^{-\theta}+(1-\delta)\right]^{-1/\theta} \qquad (1)$$

Let q = Q/L and k = K/L, then equation (1) becomes,

$$q=\gamma\left[\delta k^{-\theta}+(1-\delta)\right]^{-1/\theta} \qquad (2)$$

Equation (2) can be further simplified:

$$q=\gamma\left[\delta\left\{k^{-\theta}+\frac{(1-\delta)}{\delta}\right\}\right]^{-1/\theta}$$

$$=\gamma\,\delta^{-1/\theta}\left[k^{-\theta}+\frac{(1-\delta)}{\delta}\right]^{-1/\theta} \qquad (3)$$

Let $\gamma \delta^{-1/\theta} = Z$

$$\frac{(1-\delta)}{\delta} = B$$

Then equation (3) becomes,

$$q = Z\ (k^{-\theta} + B)^{-1/\theta} \qquad (4)$$

Using the first-order conditions for profit maximisation which are:

$$\frac{\partial Q / \partial L}{\partial Q / \partial K} = \frac{(1-\delta)\, L^{-(1+\theta)}}{\delta\, K^{-(1+\theta)}} = w$$

$$\frac{(1-\delta)}{\delta} \left[\frac{L}{K}\right]^{-(1+\theta)} = w$$

$$\frac{(1-\delta)}{\delta} \left[\frac{1}{k}\right]^{-(1+\theta)} = w$$

$$\frac{(1-\delta)}{\delta}\, k^{(1+\theta)} = w$$

$$B\, k^{(1+\theta)} = w$$

$$k = \left[\frac{w}{B}\right]^{1/(1+\theta)} \qquad (5)$$

where w = W/R

W = Wage

R = Rental

Let w_f = a distortion-free wage-rental ratio

w_d = the actual wage-rental ratio

d = the proportionate distortion

Then, $w_d = w_f (1 + d)$ (6)

Combining equations (4) and (5),

$$q = Z\left[\left\{\left(\frac{w}{B}\right)^{1/1+\theta}\right\}^{-\theta} + B\right]^{-1/\theta}$$

$$= Z\left[\left(\frac{w}{B}\right)^{-\theta/1+\theta} + B\right]^{-1/\theta}$$

$$= Z\left[\frac{1}{B^{-\theta/1+\theta}}\left(w\right)^{-\theta/1+\theta} + B\right]^{-1/\theta}$$

$$= Z\left[\frac{1}{B^{-\theta/1+\theta}}\left(w^{-\theta/1+\theta} + B.B^{-\theta/1+\theta}\right)\right]^{-1/\theta}$$

$$= Z\left\{B^{\theta/1+\theta}\right\}^{-1/\theta}\left(w^{-\theta/1+\theta} + B^{1-\{\theta/1+\theta\}}\right)^{-1/\theta} \tag{7}$$

Combining equations (6) and (7):

$$q_f = Z\left\{B^{\theta/1+\theta}\right\}^{-1/\theta}\left[w_f^{-\theta/1+\theta} + B^{1-\{\theta/1+\theta\}}\right]^{-1/\theta} \tag{8}$$

$$q_d = Z\left\{B^{\theta/1+\theta}\right\}^{-1/\theta}\left(w_d^{-\theta/1+\theta} + B^{1-\{\theta/1+\theta\}}\right)^{-1/\theta}$$

$$= Z\left\{B^{\theta/1+\theta}\right\}^{-1/\theta}\left(\left\{w_f(1+d)\right\}^{-\theta/1+\theta} + B^{1-\{\theta/1+\theta\}}\right)^{-1/\theta}$$

$$= Z\left\{B^{\theta/1+\theta}\right\}^{-1/\theta}\left(w_f^{-\theta/1+\theta}(1+d)^{-\theta/1+\theta} + B^{1-\{\theta/1+\theta\}}\right)^{-1/\theta} \tag{9}$$

$$q_n = \frac{q_f}{q_d} = \frac{Z\left\{B^{\theta/1+\theta}\right\}^{-1/\theta}\left(w_f^{-\theta/1+\theta} + B^{1-\{\theta/1+\theta\}}\right)^{-1/\theta}}{Z\left\{B^{\theta/1+\theta}\right\}^{-1/\theta}\left(w_f^{-\theta/1+\theta}(1+d)^{-\theta/1+\theta} + B^{1-\{\theta/1+\theta\}}\right)^{-1/\theta}}$$

$$= \frac{\left\{ w_f^{-\theta/1+\theta} + B^{1-(\theta/1+\theta)} \right\}^{-1/\theta}}{\left\{ w_f^{-\theta/1+\theta} (1+d)^{-\theta/1+\theta} + B^{1-(\theta/1+\theta)} \right\}^{-1/\theta}} \qquad (10)$$

q= (Q/L) is output per unit of labour. Therefore, if one is interested in labour coefficient, i.e labour per unit of output, the reciprocal will be used instead; (L/Q) = 1/(Q/L) = 1/q.

If we are interested in changes in labour coefficient when distortions are eliminated, the reciprocal of q_n should be used:

Labour coefficient $= 1/q_n = 1/(q_f / q_d) = q_d / q_f$

Therefore,

$$\text{Labour coefficient} = \left[\frac{w_f^{-\theta/1+\theta} (1+d)^{-\theta/1+\theta} + B^{1-(\theta/1+\theta)}}{w_f^{-\theta/1+\theta} + B^{1-(\theta/1+\theta)}} \right]^{-1/\theta} \qquad (11)$$

The CES elasticity of substitution is defined as,

$\sigma = \frac{1}{1+\theta}$ and thus equation (11) becomes:

$$\text{Labour coefficient} = \left[\frac{w_f^{-\sigma\theta} (1+d)^{-\sigma\theta} + B^{1-\sigma\theta}}{w_f^{-\sigma\theta} + B^{1-\sigma\theta}} \right]^{-1/\theta}$$

Replacing B with $\frac{(1-\delta)}{\delta}$, the labour coefficient becomes,

$$= \left[\frac{w_f^{-\sigma\theta} (1+d)^{-\sigma\theta} + \left(\frac{1-\delta}{\delta}\right)^{1-\sigma\theta}}{w_f^{-\sigma\theta} + \left(\frac{1-\delta}{\delta}\right)^{1-\sigma\theta}} \right]^{-1/\theta} \qquad (12)$$

For given values of σ and d, the equation (12) is well behaved. This means that the labour coefficient changes only very slightly for different values of w and δ. The value of q_d / q_f is very much determined by σ and d. For illustration, estimates of equation (12) was calculated for fixed σ and d but w and δ take various values.

σ	d	w	δ	q_d / q_f
1.5	5.6	151.1	0.7	8.4
1.5	5.6	97.6	0.7	8.3
1.5	5.6	56.4	0.7	8.3
1.5	5.6	46.4	0.7	8.3
1.5	5.6	151.1	0.8	8.4
1.5	5.6	97.6	0.8	8.4
1.5	5.6	56.4	0.8	8.4
1.5	5.6	46.4	0.8	8.4
1.5	5.6	151.1	0.5	8.1
1.5	5.6	97.6	0.5	7.9
1.5	5.6	56.4	0.5	7.8
1.5	5.6	46.4	0.5	7.7

The values of w represent the Malaysian wage–rental ratio from 1965 – 1970:

1965 = 56.4
1966 = 151.1
1969 = 46.4
1970 = 97.6

The values of δ (0.5 and 0.8) are the possible extreme values of the distribution parameter.

QUESTIONNAIRE FOR SURVEY OF GOVERNMENT INCENTIVES: TEXTILE AND ELECTRICAL/ELECTRONIC INDUSTRY 1986

I General Information

Sample No

1. In what year was the establishment registered or incorporated

2. In what year did commercial production start

3. (a) What is the legal organisation of this establishment

(i) individual proprietorship
(ii) partnership
(iii) private limited company
(iv) public limited company
(v) cooperative
(vi) others(please specify________________
____________________________________)

(b) Country of incorporation- head office(for multinational subsidiary, parent company location)

____

4. Is your establishment an offshore facility — Yes / No

5. Is your factory situated in

(i) industrial estate
(ii) free trade zone
(iii) industrial area off industrial estate
(iv) others (please specify______________________
____________________________________)

II Sources of Funds

1. Please indicate the distribution of capital investment in the establishment:

Source	At date of incorporation	As at 31 Dec 1985
From Local sources		
From foreign sources		
TOTAL		

2. Authorised capital of establishment: $____________________ million

III Production

1 (a) Electrical/electronic industry. Main types of products

Consumer Goods

- Transistor radios ☐
- Monochrome TVs ☐
- Colour TVs ☐
- Cassette tape recorders ☐
- Radio cassette players ☐
- Clock radios ☐
- Radio telephones ☐
- Digital clocks ☐
- Watches ☐
- Stereo equipment ☐
- Calculators ☐

Components

- Semiconductor components (transistors, diodes,integrated circuits) ☐
- Electron tubes ☐
- Capacitors ☐
- Resistors ☐
- Computer components ☐
- Other passive components ☐

Industrial/Commercial Products

- Computers ☐
- Communications ☐
- Test equip ☐
- Measuring equip ☐
- Scientific equip ☐
- Medical equip ☐
- Industrial control equipment ☐
- Military products ☐
- Cables ☐
- Records ☐

(b) Textile industry. Main types of products

Fibre manufacturing

- Man-made fibre ☐
- Natural fibre ☐

Fabric manufacturing

- Spinning ☐
- Weaving ☐
- Dyeing ☐
- Bleaching ☐
- Printing ☐
- Finishing of yarn&fabric ☐
- Texturing ☐
- Knitting ☐

Wearing apparel

- Shirt ☐
- Dress ☐
- Babywear ☐
- T-shirt ☐
- Batek dress &shirt ☐
- Knitted apparel ☐

Other textile products

- Umbrella ☐
- Rope ☐
- Net ☐
- Lace ☐
- Table cloth ☐
- Other products ☐

Note. More than one box may be ticked.

2. Value of Products Manufactured During 1985.

(a) Value of products.

Product	Unit of quantity	Quantity produced	Value of ex-factory sales $
(i)			
(ii)			
(iii)			
(iv)			
(v)			
(vi)			
(vii)			
(viii)			
Total	—	—	

(b) Value of work done for other establishments/firms $ ______________

(c) Total receipts: =(a) +(b) $ ______________

3. What are the reasons that cause an increase or decrease in the demand for your product. (please rank them if there is more than one reason)

(i) Change in demand from foreign countries(give examples of those countries____)
(ii) Change in demand from Malaysian consumers.
(iii) Change to tariff or quota
(iv) Strategy of the multinational companies
(v) Competition from other products
(vi) Others(please specify____)

4. Does the choice of what kind of product to produce depend on:(please rank them if there is more than one reason)
(i) Foreign demand
(ii) Malaysian demand
(iii) Multinational policy
(iv) Technology available
(v) Profitability
(vi) Others (please specify____)

5. Does your company plan to upgrade your products so that they involve higher production technology(ie need more complex machines and employees with greater skills)

Yes
No

6. When your company started operation, was the product meant for

(i) Export market
(ii) Domestic market

7. (a) Do you intend to produce any new ranges of products in the next two years,

Yes
No

(b) If **Yes,**
(i) what kind of products ____
(ii) for foreign market
for Malaysian market

IV VALUE OF FIXED ASSETS AND CAPITAL EXPENDITURE

1. Assets owned:

Type of Asset	Purchases in 1985 (M$ 000)	Gross Book Value as at Financial Year Ended '85 (M$ 000)
(a) Land		
(b) Building and other construction(including land improvment)		
(c) Transport equipment		
(d) Other machinery and equipment		
TOTAL		

2. Assests rented:

Type of Asset	Yearly Rent Paid During Financial Year Ended '85(M$000)	Estimated Current Market Value (M$'000)
(a) Land		
(b) Building and other construction (including land improvment)		
(c) Transport equipment		
(d) Other machinery and equipment		
TOTAL		

V MARKETING OF PRODUCTS

1. How do you sell your product

	% of sales
(i) directly to the final consumers	
(ii) to retailers	
(iii) to wholesalers	
(iv) to own shop	
(v) to franchise	
(vi) to others (please specify________________ ____)	

2. What is the market coverage of your product

Coverage	% share of own product
Within the state (approx)	
Malaysia	
Export	
Total	100 %

3. If your products are exported

(a) give the destination breakdown

	%
North America	
Europe	
Japan	
Australia/New Zealand	
ASEAN	
Others	

(b) Indicate proportion of exports made through each outlet

	%
Parent company	
Sister branch outside parent country	
Own marketing agents	
Independent firms	
Others(please specify____________________ ____)	

4.(a) Do you find that market size is a problem Yes ☐ No ☐

(b) If **Yes**; is it
too small ☐
too scattered ☐
others(please specify____________________
____) ☐

5. When did you start exporting your products
(i) when the firm started operation ☐
(ii) after 1-2 years of operation ☐
(iii) after 3-4 years of operation ☐
(iv) after 5 or more years of operation ☐

6. Does your firm export its product because of (please rank if there is more than one reason)

(i) export incentives given by the government ☐
(ii) Malaysian market too small ☐
(iii) licensing agreement with overseas company ☐
(iv) others(please specify____________________ ☐
____)

7. (a) Do you face any barrier(in the form of tariff or quota) to your products when exporting
Yes ☐
No ☐

(b) If **Yes**, please specify______________________
____
____

VI FACTOR INPUT

1 Cost of Material and Supplies Used During Your Financial Year Ended 1985

Category	Item	Quantity Consumed	Cost Delivered at Factory	% Imported
(a) Materials	(i)			
	(ii)			
	(iii)			
	(iv)			
	(v)			
	subtotal	—		
(b)Fuels Lubricants	coal			
	firewood & charcoal			
	petrol & diesel			
	other fuels			
	lubricants			
	subtotal	—		
(c) Utilities	electricity			—
	water			—
	subtotal	—		—
(d) Supplies	packing material			
	consumable stores			
	material for maintenance& repairs			
	office supplies			
	subtotal	—		
(e) Work Done by Others for the company		—		
TOTAL		—		

2 Non-Industrial Services, Indirect Taxes and Subsidies During Financial Year Ending 1985.

A. Cost of Non-Industrial Services Rendered by Others

Item	Value
(i) advertising	
(ii) accounting, auditing fees	
(iii) legal fees	
(iv) insurance paid on assets	
(v) rent(excluding for the land)	
(vi) postage, telephone& telegram charges	
(vii) purchased transport services	
(viii)travelling expenses & entertainment	
(ix) others(specify____________________)	
TOTAL	

B Indirect Taxes Paid by the Company

Item	Value
(i) excise taxes(paid on own manufactured products)	
(ii) assessment	
(iii) quit rent	
(iv) sales tax	
(v) licence fees	
(vi) business registration fees	
(vii) export duties	
(viii) others(specify________________________)	
TOTAL	

C Subsidies Received by the Company $__________

(specify____)

3 Do you pay any taxes on your imported material Yes ☐ No ☐

VII Employment and Payroll 1985

1 Employment and Wage Rates

Category of Worker	No of Workers as at December 31 1985		Salary& Wages Payment, Bonuses,and other cash allowances to paid employees
	male	female	
A Unpaid Worker i) working proprietor			
ii) unpaid family worker			
Total A(i) to A(ii)			
B Paid employee-full time i) managerial, professional technical & supervisor			
ii) clerical & general worker			
iii) directly employed factory worker: a) skilled			
b) unskilled			
iv) contract worker			
v) home worker			
Total B(i) to B(v)			
C Paid employee-part time i) managerial,professional, technical & supervisory			
ii) clerical & general worker			
iii) factory worker a) skilled			
b) unskilled			
Total C(i) to C(iii)			
GRAND TOTAL			

2. Highest educational level attained by workers

	No of workers
university graduate	
professional qualification	
college or technical institute	
STP/HSC	
SPM/MCE	
SRP/LCE	
primary education	
others(please specify________________ ______________________________)	
TOTAL	

3. What is the proportion of workers with previous experience

	%
in manufacturing	
in other similar companies	
in branch/sister company	

4. No of employees recruited in financial year ending

1985	1984	1983	1982	1981

5. Approximate starting daily/ monthly wage-rate in different job categories:

	Starting wage rate
management	________________
professional	________________
technical	________________
supervisor	________________
clerical	________________
manual	________________
production worker	________________

6. How do end of December 1985 wage levels, overall, compare with wage levels as at end December 1980:

(i) has not increase

(ii) increased between 0-5 %

(iii) increased between 6-10 %

(iv) increased between 11-15 %

(v) increased by 16 % or more(specify______________)

(vi) decreased

7. No of employees resigned, retired or retrenched in financial year ending

1985	1984	1983	1982	1981.

8. After taking into account the productivity difference, how do you compare Malaysian wages with the following countries:

	Malaysia is higher	Same	Malaysia is lower
Parent company country			
Hong Kong			
South Korea			
Taiwan			
Singapore			

9. List the most important factors affecting wages: (please rank in order of importance if there is more than one factor)
   - (i) wage level of other companies in the same industry. ☐
   - (ii) wage level of the manufacturing sector ☐
   - (iii) productivity ☐
   - (iv) wage guidelines of the government ☐
   - (v) trade unions ☐
   - (vi) cost of living / prices ☐
   - (vii) others (please specify________________________ ________________________) ☐

10. If your company increased its labour force in the financial year ended 1985 , please indicate the reason why
    - (i) expansion of production because of increase in export demand ☐
    - (ii) expansion of production because of increase in Malaysian demand ☐
    - (iii) others (please specify________________________ ________________________) ☐

11. If your company retrenched workers in the financial year ended 1985 please indicate the reason why

(i) decrease in production because of slowdown in export demand [ ]

(ii) decrease in production because of slowdown in Malaysian demand [ ]

(iii) others (please specify________________________ [ ]
____)

VIII CAPACITY UTILISATION

1. How many full days did the entire company close during the financial year ended 1985 (report all days idle, including weekends, holidays, maintenance and repair periods)

[| |] days

2. During a typical operating day, for how many hours is there manufacturing activity (on average)

[|] hours

3. (a) Does your company usually operate on Saturdays

Yes [ ]
No [ ]

(b) if **Yes**, how many hours (on average)

[|] hours

4. What is your average utilisation of production capacity

__________%

5.(a) Is this your optimum utilisation of production capacity

Yes [ ]
No [ ]

(b) if **No**, please rank the reasons why it is not the optimum utilisation rate:

(i) shortage of labour [ ]
(ii) frequent maintenance of machinery [ ]
(iii) fluctuation of demand [ ]
(iv) strike [ ]
(v) shortage of working material [ ]
(vi) others(please specify________________ [ ]
____)

IX ANCILLARY FIRM RELATIONSHIP

1. What proportion of components used in making your final product is purchased from others

Part or component	Manufactured outside establishment	
	Malaysian(%)	Foreign(%)
(i)		
(ii)		
(iii)		
(iv)		
(v)		

2. If some of your components/parts are imported, please indicate the reasons (please rank the reasons if there is more than one)

(i) unavailable locally ☐
(ii) under license to purchase from parent company overseas ☐
(iii) Malaysian components are inferior compared to imported ones ☐
(iv) imported components are cheaper than local ones ☐
(v) others(please specify______________________
______________________) ☐

3. How long have you been buying parts or components from an outside supplier

(i) since the company first started operation ☐
(ii) more than 6 months ☐
(iii) more than 1 year ☐
(iv) more than 2 years ☐
(v) more than 3 years ☐

4. Do you plan to produce these components /parts yourself in future

Yes ☐
No ☐

5. (a) Are your products incorporated in other manufactured articles by your customers

Yes ☐
No ☐

(b) If **Yes,** what proporation of your products are used in that way ______%

(c) Are these firms,

parent company ☐
sister branch outside parent company ☐
independent firms ☐
licensing company ☐

6.(a) Is your company a subcontractor/subsidiary of any primary firm(Malaysian or foreign)

Yes ☐
No ☐

If **Yes,** please answer the following question:

(b) Please indicate the percentage of your own production that is carried out on a subcontracted basis for others

______%

(c) If the primary firm has any investment in your company , indicate the proportion of this investment in relation to your total paid up capital

______%

(d) Do you obtain any material from any primary firms

Type of material	Annual cost during financial year ended 1985 (M$ 000)
(i)	
(ii)	
(iii)	

(e) Does any primary firm second any personnel to your firm

Yes ☐
No ☐

X INCENTIVES

1. What kind of incentives or assistance has your company received from the government

	Date of issue	Date of expiry
(a) Fiscal Incentives		
(i) Pioneer status	______	______
(ii) Investment tax credit	______	______
(iii) Labour utilisation relief	______	______
(iv) Export incentive	______	______
(v) Locational factor	______	______
(vi) Accelerated depreciation allowance	______	______
(vii) Tax exempted imports	______	______
(viii) Export tax exemption	______	______
(ix) Others(specify______ ______)	______	______

(b) Non-fiscal government assistance
- (i) Business training ☐
- (ii) Advisory services ☐
- (iii) Bulk purchasing facilities ☐
- (iv) Low rent for business premises ☐
- (v) Others(please specify______ ______) ☐

2. If your products are mainly for the domestic market, do you receive any incentive for producing and selling them
Yes ☐
No ☐

If **Yes**, please specify______
______)

3. Do you think that incentives are essential to the future prosperity of your company
Yes ☐
No ☐

4. Recently the government announced new incentives for exports. If you have been producing for the domestic market only, do you plan to change your strategy to exporting because of these incentives
Yes ☐
No ☐

5. What type of assistance would you like to receive, if any? Please list them in order of importance if there are more than one
- (i) fiscal - such as 1(a) above ☐
- (ii) non-fiscal - such as 1(b) above ☐
- (iii) loans ☐
- (vi) other financial assistance(like grants, subisdy) ☐
- (v) non-financial assistance(specify______ ______) ☐

X TECHNOLOGY

1. Describe the main processes of production

Process I

____

____

Process II

____

____

Process III

____

____

2. For which process do you used the most advanced technology

	Yes	No
Process I	☐	☐
Process II	☐	☐
Process III	☐	☐

3. (a) Do you know if there is an alternative method of production for these processes

	Yes	No
Process I	☐	☐
Process II	☐	☐
Process III	☐	☐

(b) If **Yes**, what kind of technology is used

	More advanced	Similar	Less advanced
Process I	☐	☐	☐
Process II	☐	☐	☐
Process III	☐	☐	☐

(c) If **Yes**, indicate the level of labour used

	More labour	Same	Less labour
Process I	☐	☐	☐
Process II	☐	☐	☐
Process III	☐	☐	☐

4. Why do you choose your present production method

(i) it is the only method available in Malaysia ☐

(ii) it is the only method available in the world ☐

(iii) it is the cheapest method of production ☐

(iv) licensed by the parent company ☐

(v) it does not use too many workers ☐

(vi) others(please specify______________________ ☐

____)

5. How do you regard the present level of technology used in your production process

Advanced ☐
Medium ☐
Low ☐

6. In the next two years, do you plan to use or bu..y more advanced machinery for producing your product

Yes ☐
No ☐

XI OTHER INFORMATION

1. In the next two years, do you have any plan for expansion of production

Yes ☐
No ☐

2. If **Yes,**

(a) Do you plan to buy more machinery — Yes ☐ No ☐

(b) Do you plan to use more labour — Yes ☐ No ☐

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