EVALUATION OF THE 1988 MALAYSIAN TAX REFORM PROPOSALS

A GENERAL EQUILIBRIUM APPROACH

by

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THESIS SUBMITTED FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY
TO THE UNIVERSITY OF LONDON

1991
ABSTRACT

In the Malaysian 1988 tax reform proposals, recommendations were put forward to reduce taxes on corporations by an effective rate of 10%, to introduce Value Added Tax system, to implement some short term measures such as the blanket increase in the Sales tax rates by 5%, to reduce export tax and to broaden the tax base on import tax. These proposals has been evaluated and counter proposed by the author.

A general equilibrium approach was adopted to evaluate the proposal. The model used was static in nature and only produced a marginal impact due to restructured tax instruments. Some extrapolation on the result was necessary to enable data to be used for a specific evaluation. An actual benchmark data set was constructed based on data available from Malaysian Statistics, except in certain areas where actual figures were not available. Sensitivity analysis was performed on these assumed parameters to gauge the sensitivity of the result.

The work performed here would make a significant contribution to the economic forecasting work in Malaysia, as it paves the way for a general equilibrium theory in the area of tax reform. It would also permit more extensive research to be carried out using such a model especially in the annual budget exercise of the Treasury Department.
The study shows that Corporate Tax is one of the most efficient and productive tax instruments in the economy. Its tax burden distribution has also been found to be quite positive. It has therefore been ascertained that reducing the tax would be unjustifiable unless a better tax instrument was created. The author's (counter) proposal to reduce Payroll Tax rate by 5% was found to be more viable as Payroll tax was found to be inefficient and unproductive. This counter proposal would also achieve the objective of reducing the cost of doing business in Malaysia and at the same time improve the overall tax burden distribution. The existing imputation tax system was found to still be the most efficient and productive mechanism for Malaysia.

The proposal to introduce the Value-Added tax system is optimally desirable judging from the three main criteria of efficiency, equity, and tax revenue productivity. The claim that the tax system would create some inflationary impact was also proven to be ill founded; provided the tax rate structure is not altered. In other words, an effort to make the rate structure uniform should occur in stages. In analysing the various feasible types of VAT system, the consumption type was the most efficient, tax productive as well as equitable.

The author's proposal to increase tax rates on Clothing and Footwear and Manufacturing durables was also found more viable, as these two instruments are quite outstanding, compared to others in the system. A counter suggestion to abolish the export tax altogether is also sensible if the tax revenue loss was recouped by raising the rate on the producers tax. This is optimal, and hence desirable, since a producers tax has been observed to be much more efficient and productive than the export tax. It had however been qualified that the counter proposal
will only be viable when a separate channel of marketing could be created for small scale producers in an effort to exempt them from paying the tax. Finally, it is also desirable to exclude imported manufacturing durables from the import tax base judging from the efficiency, tax productivity as well as equity objectives of tax reform.

The sensitivity analysis on the income elasticity and the substitution elasticity of the household sector had been carried out to prove the moderate nature of the result obtained in the tax reform analysis.
ACKNOWLEDGEMENTS

In the process of writing this thesis, I received the constant support and encouragement of numerous people, especially at the Department of Economics, University College London, and I am grateful to all of them. Above all, I would like to express my profound appreciation and gratitude to my supervisors, Professor Christopher Heady (now at the University of Bath) and Dr. Donald Verry for their continuous guidance and timely advice. I also wish to record my appreciation to Professor Wauter Keller (at Vrije University, Amsterdam) for his kind assistance in both the programming and the development of the general equilibrium system used here.

Gratitude is also due to my sponsors, the Commonwealth Universities Association, the British Council and Universiti Kebangsaan Malaysia for providing me with financial and other assistance. To the Malaysian Institute of Economics Research, gratitude must also be recorded, for allowing me to extend some earlier research work in the area and for data collection assistance.

I also owe my wife, Suraiya, Dr. Hamzah Ismail, Ms. Victoria Drake and A. J. James for their invaluable assistance in editing the thesis. I must also thank Mr. Mahfus Safiee for his help with the printing of this thesis. Last but not least, I must also record my special gratitude to my wife and two children Azureen and Akmal for their understanding and patience during the course of my studies.

Barjoyai bin Bardai
April 1991
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CHAPTER 1
INTRODUCTION TO TAXATION AND TAX REFORM

1.1. INTRODUCTION

Colbert, the Finance Minister of Louis XIV (1619 - 1683), said "The art of taxation consists in so plucking the goose as to obtain the most feathers for the smallest amount of hissing" (Spencer, 1978). This quotation embodies the very theme of this research. It is about the concern\(^1\) to collect the maximum tax revenue\(^2\), while at the same time minimizing distortion\(^3\) and improving the income distribution of the society\(^4\).

This first chapter introduces the research project; its objectives and contribution, outlines the organization of the thesis and particularly introduces some basic literature relevant to the subject matter covered in the research. It then proceeds with a description of subject matters tackled by reformers in the past, discussion on tax reforms around the globe and finally a brief discourse on the findings of several researchers in their previous tax reforms evaluation.

\(^1\) By the Malaysian Government.
\(^2\) 'plucking feathers from the goose'.
\(^3\) 'amount of hissing from the goose'
\(^4\) An additional objective which gained popularity since Rawls.
1.2. OBJECTIVES OF THE THESIS

This thesis evaluates the impact of the Malaysian tax reform exercise in terms of the three main objectives described above. The research idea emerged from a pressing need to forecast the impact of the Tax Reform proposals presented by the Tax Reform Group (TRG) to the Malaysia Treasury. After composing the comprehensive reform proposals, the TRG felt the dire necessity to project, in quantitative terms, the impact of the so-called 'optimal proposal'. The lack of proper instruments means that the TRG had to confine evaluation to qualitative measures only.

This research strove to accomplish the above task by employing a General Equilibrium model, taking into account the major household sectors in the economy, public and foreign sectors and industry. The model was intentionally kept manageable but sophisticated enough to capture the impact and effect of the Tax reform proposals in terms of the three basic criteria mentioned above. It attempts to evaluate all tax instruments available in the

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5 Which had been implemented by the Malaysian Treasury in 1988.
6 Tax revenue generation, economic efficiency and income distribution.
7 Of which the author was the research coordinator.
8 This was felt by all members of the group, the sponsor, the Malaysian Institute of Economics Research (MIER) as well as the Treasury.
9 Apart from some rudimentary arithmetic calculations.
10 Only six households classes were used, to make the task manageable.
11 Ten industrial sectors classification, including agriculture were used again for practical reason.
economy, while at the same time gives particular attention to evaluating the implication of reform in the Corporate taxation and the introduction of the Value-Added-Taxation in Malaysia. This thesis hopes to produce some credible projections which would act as a revision of the previous research enacted by the TRG.

Developing and utilising an econometrics model to analyse the Malaysian Economy is not new. Several such models have been in use since the 1960's. In 1965, the Economic Planning Unit developed a Harrod-Domar type model\(^\text{12}\). This was followed by several models developed by ECAFE in 1968\(^\text{13}\), Cheok (1972)\(^\text{14}\), Raja Lope (1975)\(^\text{15}\), Tillman (1975)\(^\text{16}\), Cheong Kee Cheok and Tillman (1976)\(^\text{17}\), Leong, Jaafar and Ho (1976)\(^\text{18}\), Jaafar Ahmad (1976)\(^\text{19}\), Bakar Karim, Lum Chee Soon and F.J.Lysy (1977)\(^\text{20}\), Hayes (1977)\(^\text{21}\),

\(^{12}\) To estimate the capital requirements of the Malaysian first development plan in 1965.

\(^{13}\) A macro model developed and used for the projection of feasible growth and trade gap.

\(^{14}\) A macro model which described the real sector in Malaysia.

\(^{15}\) A small model of Keynesian variety for Malaysian economy, as part of his PhD dissertation submitted to the University of London.

\(^{16}\) A financial sector model.

\(^{17}\) Again a financial model with more sectors.

\(^{18}\) A real sector model.

\(^{19}\) A monetary model for the Malaysian financial sector.

\(^{20}\) A price endogeneous multi-sector macro model to simulate the impact of price changes on aggregate demand, household savings, growth and income distribution, as part of the World Bank funded project.

\(^{21}\) An attempt to link real sector with the financial sector.
Semudram (1980)\textsuperscript{22}, and Abe (1982)\textsuperscript{23}. As recently as 1989, Demery and Harrigan (1989)\textsuperscript{24} had developed a Keynesian based General Equilibrium policy simulation model for the Malaysian Human Resources Development Programme\textsuperscript{25}.

Most of the models listed above are Keynesian in nature and none of them were developed to deal with the tax aspect of the Malaysian economy\textsuperscript{26}. The research presented here would thus be an attempt to complement the above research effort in applying a General Equilibrium model or macroeconomic model as an economic policy-making tool. The model here is specifically targeted at simulating and projecting the tax implication using a General equilibrium model, which is Walrasian in nature. The research would be of some contribution to the economic forecasting work in Malaysia, as it would pave the way for future research works on tax reform impact projection in Malaysia. This could be applied on the annual budget proposals of the Treasury employing the general equilibrium approach\textsuperscript{27}.

\textsuperscript{22} A macro model for the Malaysian economy, (the first completely integrated model of real and financial sector) as part of his PhD dissertation at Macquarie University in Australia.
\textsuperscript{23} An extended version of Semudram's model, in terms of its size.
\textsuperscript{24} World Bank consultants who are attached to Bristol and Strathclyde Universities respectively.
\textsuperscript{25} As part of the Manpower Planning Studies conducted for the International Labour Office, Geneva.
\textsuperscript{26} What more to project tax reform proposals impact.
\textsuperscript{27} This simulation exercise could be carried out annually as a response to the Minister of Finance budget proposal.
1.3. ORGANISATION OF THE THESIS

The thesis begins by introducing the research scope, objective, proposed contribution with a preliminary survey of the relevant literature. This is then followed by a brief discussion of the Malaysian Economy (pre-reform situation) and a description of the specific tax reform proposals submitted to the Treasury as described in Chapter Two. Chapter Three outlines the General Equilibrium model employed in this research by specifying its elements, assumptions, inter-relationship between variables, and its strengths and weaknesses. Chapter Four describes the benchmark equilibrium data sets used and the parameters used in the model as well as the procedures of obtaining and adjusting those data.

The findings of the author’s basic research is dealt with in Chapter Five. It opens by recounting the impact of absolute changes in the tax instrument. It then proceeds to the analysis of the effect of normalised changes in each of the tax instruments. Chapter Six devotes full attention to the projected impact of introducing Value-Added Tax in Malaysia. It also compares the various feasible types of Value-Added-Tax systems, namely the Income type, Consumption type and the Consumption type with zero rating of food items.

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28 Only the reform proposals that have later been specifically evaluated in the thesis are discussed here.
29 Basically an exercise to verify the sensibility of the output generated by the model.
30 By placing a specific attention on the impact of efficiency, equity distribution and tax revenue generation.
Chapter Seven confines itself to the analysis of the impact of reform in Corporate Taxation. More in depth analysis has been achieved by comparing the various forms of Corporate tax systems, namely the Classical system, Imputation system and the Pure-Corporate-Tax system. This chapter also presents the results of a sensitivity analysis, which is conducted by altering the income elasticities of households group on the supply of capital services. This is to ensure the sensitivity of the results. Finally, Chapter Eight concludes the main discussion by summarising the author's counter proposals made on the original tax reform agenda based on the findings.

Some other literature has been included in the appendix of the thesis. This includes a background of the Malaysian Taxation system, the mathematical formula describing the General Equilibrium model utilised\textsuperscript{31}, the product and industries reclassification of the benchmarks data set, the input data used in the computer programming work and the result of the sensitivity analysis conducted to strengthen the research findings\textsuperscript{32}.

1.4. BACKGROUND OF TAXATION

Present day 'modern taxation' originated in the decline of the feudal system with the basic tax objective of 'contributing to finance the defense expenditure',\textsuperscript{33}.

\textsuperscript{31} Based on Keller (1980).
\textsuperscript{32} By altering the elasticities of substitution of the households sectors to check the accuracy of the finding made in the research.
\textsuperscript{33} The fundamental principle of taxation then was that "in
The 'Maxim of Taxation' laid down by Adam Smith (1776) has a significant influence on today's system of taxation\(^3^4\). This principle was rationalised by the traditional role of government, namely to provide public good, and to obtain funds for that purpose with minimum fuss and cost (John Kay 1987). Government functions progressed rapidly beyond these redistribution objectives. The predominant function of government today is to overcome inefficiencies in resource allocation, redistribute income and wealth\(^3^5\) and iron out cyclical fluctuations in the economy while ensuring an optimal level of employment and price stability (Musgrave, 1959).

As an instrument of intervention in a market economy, taxation had to conform to these government so far as practicable, all the subjects of a state should contribute, according to their respective abilities, to the sums required, for its defense against hostile aggression, the preservation of internal tranquility, and the protection of the citizens in the undisturbed enjoyment of their property and right" (McCulloch, 1845).

\(^3^4\) The maxims were:

i. The subject of every state ought to contribute towards the support of the government, as nearly as possible in proportion to their prospective abilities (revenues) that they respectively enjoy under the protection of the state.

ii. The tax which each individual is bound to pay ought to be certain and not arbitrary.

iii. Every tax ought to be levied at the time or in the manner in which it is most likely to be convenient for the contributor to pay.

iv. Every tax ought to be contrived as both to take out and to keep out of pockets of the people as little as possible.

\(^3^5\) In order to make it 'just' or 'equitable'.

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objectives. The result has been a watered-down version of the revenue objectives of taxation into simply a complement and supplement to efficiency and equity objectives.

A. OBJECTIVES OF TAXATION

One school of thought holds that 'equality' has always been the basic principle to be championed in regulating all government affairs, including taxation (see, for example Borkar 1979). This explained why the equity objective had been deep in the heart of tax policy-makers. The policy had gone beyond equality or

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36 This is based on the philosophy of a "just society" as advocated by Rawls (1971), who assumed that justice is the first virtue of social institutions. Rawls had established two principles of justice, namely:

i. The Equality principle, which asserts for equal rights to each person - same liberties and opportunities, so that no individual may be deprived of choices which other individuals possess, and

ii. The Difference principle, which states that inequalities of income, wealth, and natural abilities are justifiable only to the extent that they contribute to the improvement of the least fortunate. This has led to a rule being developed which states that:

"Any social action should be undertaken if it will make the least advantaged person better off without making anyone else worse off" (see Spencer, 1978).

Nozick (1974), has, however, countered Rawls' theory by proposing an "entitlement theory of justice", which states that "a just society is one which acknowledges that people are entitled to their possessions - no matter how unequal the distribution of goods in society as a whole - provided that the goods have been acquired legitimately without making anyone else worse off". Nozick therefore believes that 'the task of a theory of
'horizontal equity'\textsuperscript{37} into 'vertical equity'\textsuperscript{38}. The role of taxation was then extended to include incentives and deterring objectives\textsuperscript{39}. This was opposed by those who believed in neutrality. A tax is viewed as an insidious, exogenous force upsetting the general equilibrium. This is called the 'tax neutrality' principle\textsuperscript{40} with the motto 'Leave them as you find them'. Ideally, this principle would only be appropriate in a situation of Pareto optimal equilibrium\textsuperscript{41}. This prompted the development of an efficiency objective in taxation as a complement to income distribution.

The concerns of economists on taxation then became the search for a tax structure that would minimize the deadweight loss associated with raising a given amount of

\begin{itemize}
\item\textsuperscript{37} Defined as "identical tax treatment to taxpayer of identical income and position".
\item\textsuperscript{38} Defined as "different tax treatment of different taxpayers with an objective of correcting income distribution or innate differences".
\item\textsuperscript{39} Especially to promote investment and saving and also to deter consumption of certain goods.
\item\textsuperscript{40} Defined as "a tax system seeks to raise revenue in ways that avoid the distortionary effects and aims at minimising the impact of tax structure on the economic behaviour of agent in the economy".
\item\textsuperscript{41} Defined as :"a state of the economy where it is impossible to move to another allocation which would make some people better off and nobody worse off".
\end{itemize}
government revenue. This approach was pioneered by Ramsey (1927) and Pigou (1947). Crudely speaking, the Ramsay rule called for intensive taxation of the goods and services that are relatively insensitive to price. The principle was criticised for its *inegalitarian* nature. The concept of optimal taxation emerged from this individual welfare notion. It was first proposed by Mirrlees (1971) who devised a few principles for optimal income taxation, which include that, marginal tax rate should be between zero and one, marginal tax rate for the highest income group should be zero and the marginal tax rate for the lowest income group should also be zero. Sandmo (1976) defined 'Optimal taxation' in terms of achieving three basic criteria of fairness, excess burden and costs. This is normally associated with the Theory of Screening (Atkinson and Stiglitz, 1976). By indirectly searching for the pareto-efficient set of taxes.

Defined as: "optimal tax structure is one that maximizes social welfare, in which the choice between equity and efficiency best reflects society's attitude toward these competing goals".

The three criteria were:

i. minimization of resources (costs) involved in assessing, collecting and administering the tax.

ii. minimization of aggregate deadweight loss for any given tax revenue or level of public expenditures.

iii. maximization of justice and fairness in every respect.

which is concerned with the choice of certain easily observable characteristics which are related systematically to the unobservable characteristics in which we are interested. For a wider discussion on optimal taxation, see for example Sandmo (1976), Atkinson (1977), and Atkinson and Stiglitz (1980).
Despite the domination of 'Optimal taxation'\(^46\) in the present day public finance theory, the traditional theory of Equitable taxation still gains popular support. It was pioneered by Haig (1921) and Simons (1938) and is known as the 'Comprehensive Tax Base' (CTB)\(^47\). The CTB or the Equitable taxation has gained strong support which can be observed from the past few major reforms that were proposed worldwide\(^48\). The differences between the two

\(^46\) i.e. which has been concerned with the integration of both efficiency and equity criteria. (It could mean the trade off between efficiency and incentives on the one hand and equity on the other. The Meade committee (1978) had concluded on the base of the optimal income taxation that: "as a general principle;

i. Average rates of tax should be high on high incomes and low on low incomes, but at the same time;

ii. Marginal rates of tax should be exceptionally low at both the bottom and the top ends of the income scale".

Optimal taxation was criticised for neglecting several important aspects such as horizontal equity, evasion, administration and taxpayer preferences between different taxes. Tax scholars agreed that the above elements could always be incorporated into the theory (based on extensive mathematical analysis), which, despite being acknowledged by scholars like Atkinson and Stiglitz as incapable of producing unambiguous policy conclusions and whose results depend on economic relationships about which there is little empirical evidence, has yielded a substantial amount of insight into various arguments on tax theory (James and Nobes, 1983).

\(^47\) Defined as "taxation base on income from accretion which include capital gains, gifts and bequest measured in real term".

approaches have been frequently delineated in the literature\textsuperscript{49}. It has also been shown that Optimal tax base theory (OT) or partial reform is complementary to the equity tax (ET) base analysis (Zodrow 1985).

The difference between the two OT and ET approaches could be best described by following the approach of analysts in their analysis of the tax base. Hettich (1979), for example, assumed that all decision-makers in the economy agree in principle that a broadly defined income is the optimal tax base. However, political considerations and administrative costs of other unspecified forces prevent an immediate movement to a comprehensive income tax base (CTB). Decision makers may here agree on horizontal equity grounds but may disagree on vertical equity grounds because of optimal tax rates. As a result, different decision-makers may have different rankings of a set of base-expanding reform options. They would also show that in some instances, base-expanding reforms may be inferior to the status quo.

The OT theorists do not however subscribe to the optimality of a comprehensive base income tax. Bradford (1980) and Boskin and Sheshinski (1983) for example derived an optimal tax structure by performing an explicit optimization process in which tax parameters are chosen to maximize an objective function\textsuperscript{50}. The general form of the optimal taxation problem is therefore "to

\textsuperscript{49} See, for example, Musgrave (1976), Felstein (1976), Hettich (1980) and Bittker (1980).

\textsuperscript{50} Which is "a function of individual utility levels, subject to a government budget and other constraints". 
choose the parameters of the tax structure to maximize social welfare function". The OT theorist position on tax reform is that "market forces eliminate the apparent horizontal inequities\(^{51}\) but at the cost of a misallocation of resources".

Felstein (1976) concluded that in the long run, there are no horizontal inequities if all tastes are identical and there is single type of ability. The optimal tax reform problem therefore is really in trying "to balance the efficiency gains from reform against the horizontal inequity of arbitrary reform (induced redistributions of income given a fixed tax revenue generation)".

Efficiency has been the most popular issue being discussed in the literature on optimal taxation. Generally, analysis based on efficiency theory led to a recommendation for the implementation of a Lump-Sum Tax\(^{52}\). Most of these examinations on the theory of taxation were made based on a crucial assumption that the tax instruments or system recommended are to be introduced and implemented in a 'fresh economy'\(^{53}\). Distortion-free economies do not, however, exist in the real world. This has rendered all these ideal concepts of taxation less

\(^{51}\) i.e. resulting from tax advantage.

\(^{52}\) See for example Boiteux (1951, 1956), Kolm (1969, 1970), Baumol and Bradford (1970), Dixit (1970) and Diamond & Mirrles (1971). Lump sum taxes are defined as: tax instruments that do not depend on any action of the individual, and in which there is no way that he can change the tax liability. It has no substitution effect. (Atkinson & Stiglitz, 1987).

\(^{53}\) Or 'first best economy', defined as an economy without any pre-existing distorting characteristics.
relevant in practice. The subject of 'Tax design', which has preoccupied the minds of most public finance scholars needs some modification. Economists responded with the concept of 'second best economy'\textsuperscript{54} to replace the 'first best assumption'\textsuperscript{55}. They analyze and propose the best tax instruments and tax system for a particular economy\textsuperscript{56}.

Feldstein (1976), for example, stressed the point that optimal taxation must take as its starting point, the existing tax system and the fact that actual changes are slow and piecemeal in nature. Scholars like Lipsey & Lancaster (1956, 1957), Little (1956) have also concluded that a constrained 'second best policy' cannot be guided by the conclusion of an unconstrained optimization.

B. MEASURES OF TAX OBJECTIVES ATTAINMENT

From the discussion above, have been established the three crucial objectives of taxation, namely fairness, efficiency and revenue generation. These constitute the priority which instigates the basic tussle in "Optimal taxation".

\begin{itemize}
\item \textbf{54} Defined as "an economy where there is market failure and constraint in the economy that prevents the attainment of one of the conditions for a pareto optimum".
\item \textbf{55} where all conditions for pareto efficiency can be satisfied and Lump sum taxes and transfers are freely available.
\item \textbf{56} The theory of second best is concerned with the formulation of policies designed to correct market failure and change income distribution. The policy problem is to find the values of the taxes and subsidies which achieve the optimum trade-off between distributional equity and allocative efficiency (Gravelle & Rees, 1986).
\end{itemize}
Efficiency objectives of taxation are defined as the minimization or avoidance of distortion. Sources of inefficiency or distortion are normally traced to the Income effect and substitution effect of taxation. Distortion is measured using the Utilitarian principle. This necessitates the introduction of the 'social welfare concept' in evaluating the achievement of these tax objectives. Social welfare is normally measured by an inefficiency measure called 'excess burden'. In practice, 'excess burden' could be determined based on

57 Defined as "the change in quantity demanded by a buyer due to the change in his real income resulting from a change in the price of a commodity (under ceteris paribus assumption). In the case of labour supply, income effect occurred where individual increased his work hours (supply of labour services) as a response to the increase in commodity price to compensate for reduction in real income. Income effect only accounts for the change in quantity demanded or supply due exclusively to a change in real income.

58 Defined as the change in quantity demanded by a buyer resulting from a change in the price of a commodity while his real income, tastes and the prices of other goods remain the same. In the case of labour supply, substitution effect occurred when an individual reduced his work hours (supply of labour hours) for leisure as a result of the tax rate increased because of the less incentive to work. The substitution effect accounts for the change in quantity demanded due exclusively to a change in the price of a good relative to the prices of other goods.

59 i.e. taking into accounts the total social welfare experienced by all individual in the economy, particularly in terms of minimum aggregate sacrifice.

60 Defined as the welfare loss (deadweight loss) emerged as a result of imposing distortionary tax compared to the imposition of lump sum tax (which is non-distortionary).
the 'equivalent variation'\textsuperscript{61} or 'compensation variation'\textsuperscript{62} as a result of the tax imposition.

The attainment of Equity objectives on the other hand measured by observing the income distribution achieved by the society after the imposition of tax. This would have to be measured in terms of real income changes (or burden changes) as a result of the tax instrument changes. To measure tax burden distribution quantitatively, we use the Atkinson's Inequality Index (1970)\textsuperscript{63} and performed a sensitivity analysis by applying

\textsuperscript{61} Defined as "the amount of additional income at old prices that would enable the consumer to reach the new utility level": $EV = P^o_h (H^r - H^o)$.

\textsuperscript{62} Defined as "the amount of additional income necessary following the changes in taxes to maintain the consumer at its initial utility level": $CV = P^o_h (H^0 - H^r)$.

\textsuperscript{63} Based on the calculation of social welfare of households groups as follows:

$$
\omega = \frac{1}{1 - \varepsilon} \sum_{h} \phi_h \left( \frac{1}{\gamma_h} \right)^{1-\varepsilon} 
$$

$$
\frac{\delta \omega}{\delta \gamma_h} = \phi_h \left( \frac{1}{\gamma_h} \right)^{-\varepsilon} = \frac{\phi_h}{\gamma_h^\varepsilon}
$$

where,

- $\omega$ - social welfare;
- $\varepsilon$ - equality aversion factor
- $\phi_h$ - number of households in group, and
- $\gamma_h$ - average income of the group

For an observed group with a total income gain (marginal income) of say $\psi$, the per capita income gain is $\frac{\psi}{\phi}$, and the increase in the social welfare of the
different inequality aversion factors to observe the impact on households real income changes. Each index reflects the concern for inequality in the income distribution. The bigger the index, the higher the concern for the lowest income group. By observing the total as well as the average households income changes at different inequality index, it is possible to gauge the progresivity/regressivity of the specific tax instrument.

Tax revenue generation would also have to be measured in real terms. As a supplement, a measurement base on the public utility increased as a result of the tax instrument changes would also be taken into account for comparative purposes.

It must be stressed that, in our analysis of tax reform appraisal, a marginal approach has been advocated. This means that all the above measures will be applied from the figures of the marginal tax changes impact.

C. TAX INCIDENCE AND TAX SHIFTING STUDIES

Kay and King (1986) made an interesting analogy of a trader who requests a premium for payment by cheque\(^{64}\) in

\[
\frac{\psi}{\phi_h} \cdot \frac{\delta \omega}{\delta \gamma_h} = \frac{\psi}{\phi_h} \cdot \frac{\gamma^c_h}{\gamma^c_h} = \frac{\psi}{\gamma^c_h}
\]

To make the number a better size, we use \(\gamma^c_h\) instead of \(\bar{\gamma}\).

\(\gamma^c_h\) - population average income.

\(^{64}\) i.e. of 20% compared to cash payment.
trying to explain the concept of effective incidence⁶⁵. Basically, incidence of a tax refers to he who bears it, while the shifting of a tax refers to the passing of its incidence from the person who initially pays it to someone else. The incidence of a tax measures the final tax burden on different people once we have allowed for the indirect as well as the direct effects of the tax. The study of tax incidence is crucial in the analysis of taxation as formal incidence of a tax⁶⁶ is generally irrelevant to its effective incidence⁶⁷. The tax impact⁶⁸ is almost always different from the ultimate (final) burden of the tax as a result of tax-shifting phenomenon.

Incidence studies tend to be complicated, being introduced with different methodology. It is possible to follow the differential incidence⁶⁹ which compares the redistributional effects of alternative taxes or use the balanced incidence⁷⁰ methodology. The latter approach is more comprehensive and symmetrical in nature. An

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⁶⁵ Payment by cheque means that the trader will have to pay tax on the transaction and he insist on collecting the tax from the customer. It means that the tax burden is to be shifted to the customer. In the case where payment is made by cash, no tax will be shifted to the consumer as the trader might not even declare the revenue at all.

⁶⁶ The official target of the particular tax instrument.

⁶⁷ The ultimate effect that must be observed.

⁶⁸ Defined as "the point which receives the initial burden of a tax in a legal or statutory sense".

⁶⁹ Where the level of government expenditures remains unchanged while one tax is substituted for another tax of equal revenue yield to the government.

⁷⁰ Where the effect of the overall tax-expenditure process on the level of private sector income, which is considered as the level of government expenditures, matched by additional taxes, is increased.
incidence study would employ the partial equilibrium or general equilibrium approach, each with its own strengths and weaknesses.

As 'tax-shifting' is the phenomenon responsible in altering final incidence from original impact, the study of tax shifting is considered crucial. Tax shifting takes place through the market mechanism of supply and demand. Taxes induce allocational adjustments, which are in essence the substitution effects. Tax could be shifted forward to the consumer or backward to the factors owner through price changes. Ability to shift burden of tax from its initial point of impact to a different point of final incidence can be attributed to many forces. It could be influenced by the market structure conditions,

71 which will emphasise monetary or absolute price changes - measuring tax shifting and incidence in terms of a higher absolute selling price of products or a lower absolute purchase price of resources.
72 Which will emphasise changes in relative product and resources prices in the context of the interrelationship of many variables in a general equilibrium system.
73 In productive and consumptive behaviour which in turn yield redistributional results in both real tax burden and real income distribution.
74 Where price of products increased as the result of an increased in the tax rate.
75 Where as a result of the tax rate increased, prices of factors (resources) decreased.
76 Tax shifting could sometimes be disguised by an implicit rather than an outward (external) price change, in the form of quality or size reduction.
77 For example, under pure competition, in the short run, very little shifting occurred; while in the long run full shifting occurred. Under pure monopoly, shifting occurred both in short and long run through firm monopoly power. Under oligopoly (imperfect competition), at least partial shifting occurred on corporation (business) profit tax, especially where unrealised gains were created.
the cost conditions, price elasticity of demand, price elasticity of supply, the type of tax criterion and the political jurisdiction criterion.

Where under constant cost industry (a situation where average cost of production remains unchanged as output expands), full forward shifting would take place, while under an increasing cost industry (a situation where average cost rises with expanding output), partial forward shifting would take place and under a decreasing cost condition (a situation where average cost declines as output expands) a more than 100% forward shifting would take place.

Where in general, the more sensitive (elastic) the quantity demanded is to a change in price, the more difficult it is to shift monetary burden forward through higher selling price; while conversely, the more inelastic (insensitive) the quantity reaction to a price change, the greater the possibility of forward shifting of the tax.

Where, in general, the more elastic the resource supply, the less the amount of tax that can be shifted back to the factors owner, as lower offer price would sharply reduce the supply of resources and conversely, the more inelastic the resource supply, the greater the amount of the tax that can be shifted backward to the factor owner since lower offer price induces little supply reduction.

Where, in general, the more direct the tax, the more difficult shifting becomes, and the more indirect the tax, the greater the possibility of transferring its burden from the point of impact to another point of incidence. Also, the broader the tax base for an instrument, the more difficult tax shifting becomes. When the tax base is narrow, demand tends to be elastic because of the substitution effect.(For further discussion on incidence analysis, see Stiglitz, 1988).

Where, in general, the narrower the geographical limits of a political unit, the more difficult it is for the sellers to shift the tax.
D. PARTIAL VERSUS GENERAL EQUILIBRIUM ANALYSIS OF TAXATION

Most of the tax incidence and tax burden studies, especially in the first half of the twentieth century, were conducted using partial equilibrium techniques. While partial equilibrium analysis has allowed economists to develop a strong body of theory in micro-economics, the assumption of ceteris paribus is not strictly correct. It ignores the interrelationships of prices and quantities that may exist between markets. The argument supporting this approach is that such effects are small and defused; that the feedback effect they have on a particular sector can safely be ignored. Unfortunately, many taxes simultaneously affect industry.

General equilibrium analysis which would be able to take into account the interrelationships between prices and quantities of goods and resources in different markets, would demonstrate the possibility of simultaneous equilibrium between all markets and would view the economy as a system composed of interdependent parts; hence normally regarded to be a more credible tool in tax policy analysis. Carl Shoup (1969) summed up the

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83 This has, for example, been reviewed quite exhaustively by Musgrave (1959).
84 i.e. all other parameters remain unchanged.
85 By ignoring the ramifications and repercussions of price and quantity changes which may occur in other markets, we overlook the fact that such changes could significantly influence the market we are studying.
86 General equilibrium theory is based on the assumption that, if for a particular market, all participants are given such information as consumer demand schedules, resource supply schedules, production functions, and the
views of his fellow colleagues by stating that "economists have become aware that a state of mind, if not the actual engine of general equilibrium analysis was required if public finance was not to be misleading".

Lipsey (1979) however stressed that "there is no simple rule telling us when partial analysis can safely be employed. The final test is whether or not its predictions are refuted by the facts. As a first approximation, it is probably safe to say that the smaller the sector under consideration, the more likely its behaviour can successfully be predicted by partial analysis".

1.5. INTRODUCTION TO TAX REFORM

Tax reform is most conveniently defined in relation to the process involved, as a conscious and serious effort of changing a tax system in a comprehensive manner by first determining the explicit policy objectives. This is followed by an empirically grounded assessment of all relevant initial and final conditions; taking into account the political, social as well as economic situation before coming up with a model explicitly relating the instruments of the tax changes to the objectives. In a special session of the National Tax Association Tax Institute of America in honour of Carl Shoup (1976), some basic rules in tax reform were outlined comprising the rules of result, relevance, demand for money, equilibrium forces will cause commodity and resources prices to adjust themselves in a mutually consistent manner. The entire system can then settle down in a stable equilibrium of supply and demand. (Spencer, 1978).
robustness, redundancy and resiliency. The comprehensiveness of a particular reform varies with the requirement of the tax system subjected to reform and the phase of a particular reform.

Tax Reform must be distinguished from tax design. Tax design is more the construction of a perfect model. In the words of Rawls (1971) "Tax design is a guide for tax policy in the Garden of Eden". It implicitly assumes that a tax system is being introduced de novo on a 'new economy' (see Feldstein, 1976).

As a dynamic subject in an economy, Tax Reform effort is never concluded. What may be considered a job well done yesterday will suddenly became obsolete today and will necessitate further reform as a result of a particular historical/political event or environmental vicissitudes.

The rules were:

a. Rule of result - that any tax change must be appraised in terms of its effects in the context of the particular country in question.

b. Rule of relevance - that the instrument of tax changes be employed as effectively as possible in pursuit of the policy goals.

c. Rule of robustness - that requires us to check that the proposed policies does not depend upon uncertain factors and to try to propose a number of ways to achieve particular objectives.

d. Rule of redundancy - that necessitate the orchestration of many fiscal instruments regardless of its overlapping and duplication possibility.

e. Rule of resiliency - that requires us to have the auxiliary or instrumental way of achieving the result.
1.6. TAX REFORM DEVELOPMENT AROUND THE WORLD

There have been several major tax reforms commissions led by well known tax commissions in the twentieth century. In 1949, Carl Shoup led a commission to reform the Japanese tax system\(^8\). Kaldor introduced the "Expenditure tax" system in his reform assignment in India (1956) and Ceylon (1959). Tax reform initiatives shifted from the east to the west in the 1960's, i.e., especially to South America. After the Royal Commission works in Canada in 1966, many tax reform initiatives took place in South America; beginning with the Taylor commission in 1965, the Musgrave commission in 1969 and in 1974 for Columbia, Musgrave commission for Bolivia in 1974 and tax reform for Chile in 1974. Canada had another reform under the Carter commission in 1972.

During the last decade, some major reforms have occurred around the globe. Beside USA, in 1985/1986 more than 15 countries had implemented some major reform exercises, such as in Bolivia, Denmark, India, Indonesia, Jamaica, Morocco, New Zealand, Nigeria, Taiwan, Turkey, Spain, Singapore and Portugal. In 1987/1988 some further 20 countries had initiated reform commissions works on taxation. These included Austria, Australia, Barbados, Canada, El Salvador, Finland, Guatemala, Germany (F.R.), Grenada, Greece, Hingary, Japan, Kenya, Philippines and Portugal.

The subject matter tackled by the reform ranged from the tax base following Hague and Simon, equity

\(^8\) It was here that he recommended the implementation of the Value-Added Tax system for Japan.
issues based on benefit principle and ability to pay principles following Rawls and Nozick, pareto optimality based on Bergson-Samuelson social welfare function, economic efficiency following Ramsay and Pague, and finally a combination of equity and efficiency based on the optimal taxation concept following Mirrlees (1971).

1.7. RECENT REFORMS AROUND THE GLOBE

Tax Reform has more or less dominated the subject of economic studies in the eighties with more than 20 countries in the world undertaking major reform in their taxation system, and many others are in the process of or have recently completed some of the most important tax reform measures in decades. Changes range from major structural changes, such as those in Australia, Chile, the United Kingdom and the United States; to the introduction of a new tax, such as the Value-Added Tax in Spain.

Observation of the Tax Reform effort around the globe would enable an identification of the major issues being tackled by most reforms. Relevant characteristics are as follows:

i. Reduction in the personal income tax brackets and rates

ii. Lowering the corporate tax rates, frequently offset by reducing the number and scope of deductions.

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89 To reduce distortion (and hence excess burden) and to work as an incentive for individuals to create economic benefits for themselves.

90 In order to reduce inequity in the taxation of capital income.
iii. Broadening of tax bases through eliminated incentives, deduction and preferences\textsuperscript{91} as a move toward the Haig-Simon comprehensive tax base.

iv. Increased use of consumption taxes to augment fiscal revenue and to achieve a more efficient tax system which attempts to eliminate distortion. The emphasis has moved from taxation at manufacturers level to taxation at retail level employing value added tax.

v. Tackling the issue of rationality in taxing corporations and corporate tax integration\textsuperscript{92}.

vi. Revising the fiscal incentive measures normally resulted in the reduction or abolition of incentives for capital investment\textsuperscript{93} while this issue of international competitiveness dominated the mind of tax reformers.

The World Bank in its 1987 report, devoted a whole chapter to the subject of tax reform. Some of their observations are worth noting here.

i. Tax level : It was observed that, on average, taxes have risen slightly as a proportion of Gross Domestic Product.

ii. Composition of a tax system : It was observed that Income and other direct taxes played a significant

\textsuperscript{91} In order to recoup the tax revenue losses due to the rates reduction and to reduce inequity in the treatment of taxable base.

\textsuperscript{92} Even though integration has been favoured on efficiency grounds, most countries decided against integration for revenue reasons and because of its role as a rent collecting procedure.

\textsuperscript{93} with the premise that an equitable and efficient tax system will do as well, if not better, in promoting capital investment.
role in the industrialised countries (accounting for 69% of total tax revenue), with corporate taxes playing a relatively more important role. Developing countries resort more to indirect taxes due to the difficulties in taxing informal sectors with variations reflecting their stages of economic development.

The World Bank has also been advocating broad guidelines and directions for tax reform in developing countries as follows:

i. Tax reform must have broader objectives than just revenue collection. It should facilitate compliance and collection, spread its burden equitably and not conflict with patterns of production, trade, consumption, saving and investment.

ii. Tax structure reform must therefore be aimed at achieving neutrality; generating revenue with the least possible effect on the allocation of resources.

iii. Most importantly for developing countries, it must give preference to taxes that are simple and enforceable.

On specific taxes the World Bank recommended the following:

i. Consumption taxes are preferred as they do not affect the efficiency of domestic production. However, tax rates should be set relative to prices rather than quantities.

ii. International trade taxes on import should be minimised in the long run. Tariffs should be abolished because they penalize consumers and promote an
inefficient pattern of production. Import tariffs also indirectly affect exporters and reallocate resources toward import substituting industries. Export taxes are inadvisable because they reduce the incentive to produce for export. This is especially true for developing countries whose export mostly involves agriculture and natural resources sectors which have a slow rate of growth.

iii. Income Tax reform is necessary in developing countries as it could enhance the revenue and efficiency of a tax system.

iv. On Corporation Tax, they recommended that reform should attempt to achieve a high 'average effective tax rate' while keeping the 'marginal effective tax rate' (METR) as low as possible and at the same time avoid large variations in METR's across different types of investment.94

v. On investment incentives, The World Bank recommends gradual abolition of incentives through the tax system as it overloads tax instruments with multiple objectives, complicates tax compliance and prompts unproductive efforts to obtain their benefits.

vi. On tax administration, the bank recommends that developing countries attempt to simplify the task of tax administration to make policy more effective by reducing the number of discretionary elements in the tax code, separating assessment and collection, offering reasonable salary levels with more trained officials, upgrading the capacity to gather and process data to identify assessment and collection and securing political backing

94 The World bank is concerned with the administrative capacity of developing countries in this area of taxation.
for successful enforcement.

Having mentioned the prescription recommended by The World Bank experts on tax reform strategies above, it should be stressed here that there is no general prescription for a tax reform. All tax changes in an economy must be evaluated and justified in terms of the specific background in which the economy is embedded. Tax reform must also be viewed as a dynamic process of change in an economy. It needs continuous assessment and reevaluation over time after reform is assimilated into the economic system. This will be a slow process, which could take generations before its full objectives are realised.

1.8. SOME PAST TAX REFORMS EVALUATION FINDINGS

Efforts to evaluate the ramifications of tax reform impacts attempted by scholars such as Musgrave are dated. The first well-known research in this area was by Harberger (1962) on Corporation tax. He projected that the extent of corporate tax distortion in the USA was as much as 20% of the total corporate tax revenue. In his analysis of the 1986 US tax reform, Musgrave (1987) estimated that the reduction in the Corporate rate by 12% would reduce tax revenue by US$ 20 billions which would be compensated by the repeal of investment tax credit. Auerbach (1987), who also analysed the 1986 US tax reform, predicted that the Corporate tax reform in the US would cause a decline in depreciable investment and reduce the incentive to borrow. Fullerton, Ballard, Shoven and Whalley (1983) had also estimated the positive impact of integrating corporate taxation with personal income taxation in the US and found it to be substantially beneficial.
Most tax reform evaluation exercises focused on the projection of the distortion impact or economic efficiency impact of the reform on the economy. Ballard, Shoven and Whalley (1983) for example in their study of the U.S. tax reform, found that the marginal welfare costs from raising existing distorting taxes are in the range of 17 to 56 cents. They therefore concluded that large potential welfare gains could be realised by a modest reduction in tax rates, rendering tax rate changes more important than the structural reform of the tax system. Campbell (1975) also estimated the marginal excess burden of the Canadian Commodity taxes to be about 24 cents. In his study of the same reform, Browning (1976) estimated that the marginal excess burden of these taxes is in the range of 9 to 16 cents. In an analysis of the distortion in the labour supply of the same economy, Stuart (1984) estimated that the marginal excess burden was between 20.7 to 24.4 cents. For the Swedish economy, an analysis by Ingemar Hansson and Stuart estimated that the marginal excess burden ranged from 69 to 129 cents per dollar of tax. Ballard, Shoven and Whalley (1982) had also attempted a study of total welfare costs of U.S. taxation by making a hypothetical experiment of removing the entire tax system and replacing it with lump-sum levies. They estimated that the above exercise would cause the present value of welfare to increase by US $ 3.3 trillion (10 percent of national income). In their study of the Canadian Tariff structure, Boadway and Treddenick found that tariff removal would reduce the true welfare index by 2.6 percent. In his general equilibrium assessment of UK tax reform, Whalley (1973) projected that the replacement of purchase tax and selective employment tax by Value-Added Tax seems to account for a negative welfare effect, while
the increases in personal allowances would yield a positive welfare effect.

Diewert (1988) studied several issues of the Canadian tax system and found that in the case of manufacturers sales tax, the efficiency loss ranged from 2.6 to 10.1 percent of the industries output. He also found that capital taxation discriminated against equity financing and created distortion in the capital allocation. On the differential business income taxation however, Diewert estimated that the distortion effect would be quite small. Diewert also found that the efficiency costs of taxing interest income were as much as 17 per cent. Finally, Diewert showed the total business and personal taxation to be in the range of 10 to 20 per cent of the gross national product. In their analysis of the 1981 US tax reform, Jorgenson and Yun (1986) had focused on the incentive provided for immediate investments write-offs. They estimated that the provision would produce efficiency gains on the order of 26 percent of the 1980 US private national wealth.

Boadway, Chua and Flatters (1988) attempted to measure the distortion imposed by the tax system on marginal investments in Malaysia, taking into account the 1988 Tax reform proposal. They concluded that Corporate tax is distorting because the Corporate tax rate is always higher than the average personal income tax rate, with a higher distortion observed in the case of debt financing firms being heavily subsidised. This affected savings and investment in the economy. Reducing the corporate tax rate would therefore be considered beneficial in terms of its efficiency impact as it reduces the gap between the two taxes. This partial equilibrium analysis also suggests that the corporate tax system is to cause a smaller amount of capital investment than if the tax is
neutral between the treatment of debt and capital financing.

Other aspects of tax reform impact were elucidated by other studies of tax reform. Whalley (1973) in his study of the 1973 UK tax reform had projected that the distributional impact of the reform appears small, even though the lower income groups lose relative to the removal of earned income relief. In their study of the estimated changes in individual labour supply, Hausman and Poterba (1987) projected that the reform would raise labour supply by 0.9 percent. The deadweight loss involved in the income tax system changes were estimated to be 18 percent lower than the loss incurred by an average family in the 1981 tax reform act (which was at 21.8 percent of income tax collected). Pechman (1987) believed the changes in the tax liabilities were due to the 1986 US tax reform. He found that the five lowest income groups experienced some substantial drop in their tax liability at an average rate of 25 percent, compared to the 5 percent increase on the two highest income bracketed groups.

On State-Local taxes reform evaluation, Courant and Rubinfeld (1987) in their study of the 1986 US tax reform had concluded that deductibility of the state taxes in determining the federal taxes is not a good policy. They therefore suggested lower marginal tax rates in the federal taxes to enhance efficiency and at the same time reduced federal subsidies to local and state spending. In his analysis of the 1988 tax reform proposal, King (1988), enumerated the potential impact of abolishing mortgage interest relief and found that this policy would discriminate between households according to the size of their mortgage in favour of older families. Finally,
Buchanan (1987) who took a different approach, analysed the impact of the 1986 US tax reform in terms of political choice. He concluded that a major shift of taxation from individual income tax to a corporate tax base would reduce individual voter ability to appreciate the costs of social services substantially. This would amount to fiscal deception and may embody more overall distortion and waste in the political equilibrium.
CHAPTER 2

INTRODUCTION TO THE 1988 MALAYSIAN TAX REFORM

2.1. INTRODUCTION

This chapter introduces the Malaysian economy as a basis for better understanding of the reform proposals discussion that follows. The reform proposals are preceded by a discussion on the overall weaknesses of the present tax system and the overall objectives of the 1988 reform proposals. Only the particular reform proposals that are relevant to this particular research are presented. For readers who wish to gain an understanding of each of the tax instruments available in the economy, a glossary describing each of them based on statutory provisions has been included in Appendix A.

2.2. BACKGROUND OF THE MALAYSIAN ECONOMY

Notwithstanding its rapid rate of development since the 1970's, Malaysia still remains an unknown entity on the world economic scene. This is because it has been living under the shadow of the super-economy of Japan and hyper-fast growth economies of Korea, Taiwan, Singapore and Hongkong. Located in the heart of ASEAN, Malaysia symbolises the youthful vitality of the region. With a population of about 16 million, Malaysia has a per capita average economic growth rate of over 7.7% per annum since the 1970's. The latest estimate by the Central Bank showed a 10.5% growth rate for 1988.

1 These countries' performances were so outstanding by the world standard that the Twentieth century has been labeled as 'the age of the Far East'.

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income of about M$ 5,000 in 1987. From a country that relied heavily on agriculture and natural resources, Malaysia has now advanced into manufacturing into heavy industries. Malaysia has been tipped to be the fifth 'tiger' in ASIA, which will make her a newly advanced industrialised country (NIC) by 1992.

Malaysia's gross domestic product was about M$ 90,000 million of which M$ 57,000 million constituted export value. Imports, on the other hand, were about M$ 45,000 million with government consumption amounting to M$ 26,500 million and private consumption of M$ 65,500 million. Gross capital formation for the year was about M$ 22,000 million.

Malaysia has more than 6,000,000 in its labour force employed in various sectors in the economy with the majority working in the industrial sector as shown on Table 2.1. The labour force participation rate was about 66% in 1988, and is increasing at a relatively rapid rate. Considering that nearly 50% of the population is in the age group below 20 years old, the prospect of labour supply growth is therefore quite promising.

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3 A dramatic improvement from its M$ 1,000 in 1970 (the rough exchange rate is M$ 5 to one pound sterling).
4 Of which she still is the world's leading producer of palm, rubber, cocoa and tin.
5 She is now the major manufacturer of air-conditioning units and electronic components in the world.
6 Producing cars, steel, cements and other metal products.
7 After Korea, Taiwan, Hongkong and Singapore, although the government are very reluctant to accept it.
TABLE 2.1.

LABOUR FORCE IN MALAYSIA

( in '000 )

<table>
<thead>
<tr>
<th></th>
<th>Agriculture</th>
<th>Industry</th>
<th>Services</th>
<th>Others</th>
<th>% of labour force</th>
</tr>
</thead>
<tbody>
<tr>
<td>1965</td>
<td>1,770.0</td>
<td>390.0</td>
<td>720.0</td>
<td>150.0</td>
<td>50.0</td>
</tr>
<tr>
<td>1980</td>
<td>1,800.5</td>
<td>1,927.9</td>
<td>1,010.7</td>
<td>96.1</td>
<td>65.4</td>
</tr>
<tr>
<td>1985</td>
<td>1,759.6</td>
<td>2,446.4</td>
<td>1,330.7</td>
<td>87.9</td>
<td>65.8</td>
</tr>
<tr>
<td>1986</td>
<td>1,807.1</td>
<td>2,463.3</td>
<td>1,356.3</td>
<td>79.8</td>
<td>65.8</td>
</tr>
<tr>
<td>1988</td>
<td>1,908.1</td>
<td>2,700.4</td>
<td>1,396.6</td>
<td>82.2</td>
<td>66.1</td>
</tr>
</tbody>
</table>

* percentage of labour force participation.

TABLE 2.2.

DISTRIBUTION OF EMPLOYED PERSONS BY LEVEL OF EDUCATION
(in percentage)

<table>
<thead>
<tr>
<th></th>
<th>No formal education</th>
<th>Primary</th>
<th>Secondary</th>
<th>College / University</th>
</tr>
</thead>
<tbody>
<tr>
<td>1965</td>
<td>35.0</td>
<td>35.0</td>
<td>28.0</td>
<td>2.0</td>
</tr>
<tr>
<td>1980</td>
<td>18.8</td>
<td>43.6</td>
<td>34.0</td>
<td>3.6</td>
</tr>
<tr>
<td>1984</td>
<td>14.9</td>
<td>39.8</td>
<td>41.0</td>
<td>4.3</td>
</tr>
<tr>
<td>1985</td>
<td>14.1</td>
<td>39.7</td>
<td>41.5</td>
<td>4.7</td>
</tr>
<tr>
<td>1986</td>
<td>13.2</td>
<td>38.8</td>
<td>43.0</td>
<td>5.1</td>
</tr>
<tr>
<td>1987</td>
<td>12.5</td>
<td>37.3</td>
<td>45.0</td>
<td>5.1</td>
</tr>
</tbody>
</table>


Table 2.2 shows the distribution of the education background of this labour force. Even though 12% of the labour force are still without formal education, the percentage is declining fast and being replaced by the
secondary and college graduates. This reflects the growth in the skilled labour supply in the economy.

A. HOUSEHOLDS AVERAGE AND TOTAL INCOME

An important indicator of tax capacity is individual average income and total income of a household group. The following Table 2.3 presents the picture for Malaysia. Public sector income has been included to show the total national income as well⁸.

---

⁸ Foreign income has been omitted from national income which is defined as the sum of net income of domestic households. Foreign income however forms part of the aggregate income of the economy.
<table>
<thead>
<tr>
<th>Households’s class</th>
<th>Tot. income in M$mills</th>
<th>Aver. income in M$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public sector</td>
<td>26,556</td>
<td>-</td>
</tr>
<tr>
<td>Informal labour</td>
<td>15,360</td>
<td>8,238</td>
</tr>
<tr>
<td>Low income</td>
<td>11,433</td>
<td>18,010</td>
</tr>
<tr>
<td>Medium income</td>
<td>9,905</td>
<td>26,951</td>
</tr>
<tr>
<td>High income</td>
<td>17,101</td>
<td>38,145</td>
</tr>
<tr>
<td>Top brackets</td>
<td>7,453</td>
<td>101,832</td>
</tr>
<tr>
<td>Entrepreneurs</td>
<td>7,929</td>
<td>290,531</td>
</tr>
<tr>
<td>Whole population</td>
<td>-</td>
<td>20,229</td>
</tr>
<tr>
<td><strong>Total national income</strong></td>
<td><strong>95,737</strong></td>
<td></td>
</tr>
</tbody>
</table>

Source: Manipulated from the benchmark data set.

In the case of public sector’s income, the whole amount actually accounts for income from taxes\(^9\). The average individual income of each household is computed by dividing total income for each group by the number of households in the group. The population average income is computed by taking the total income of individual households by the total number of households accounted in the study.

\(^9\) As total EPF collected which had been regarded as payroll tax matched the figure for non-tax revenue, the public sector’s income figure is quite accurate.
Malaysia has been in high gear in the last two decades in order to finance rapid development. The debt structure is shown on Table 2.4. below. Taking into account the total debt figure, the position is quite alarming. However if only foreign debt was taken into account, the ratio of debt to export figure would be quite reasonable. What is comforting is that since 1987, the debt figure and the ratios have been declining quite substantially.

<table>
<thead>
<tr>
<th>Year</th>
<th>Domestic Debt (M $ Millions)</th>
<th>Foreign Debt (M $ Millions)</th>
<th>Total Debt (M $ Millions)</th>
<th>As % of GDP</th>
<th>As % of Export*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>1,490</td>
<td>860</td>
<td>2,350</td>
<td>11.75</td>
<td>4.30</td>
</tr>
<tr>
<td>1980</td>
<td>19,776</td>
<td>4,861</td>
<td>24,637</td>
<td>55.35</td>
<td>21.49</td>
</tr>
<tr>
<td>1985</td>
<td>40,812</td>
<td>23,070</td>
<td>63,882</td>
<td>111.78</td>
<td>72.38</td>
</tr>
<tr>
<td>1986</td>
<td>45,698</td>
<td>28,310</td>
<td>74,008</td>
<td>127.91</td>
<td>75.41</td>
</tr>
<tr>
<td>1987</td>
<td>54,796</td>
<td>27,629</td>
<td>82,425</td>
<td>135.46</td>
<td>66.88</td>
</tr>
<tr>
<td>1988</td>
<td>63,095</td>
<td>25,898</td>
<td>88,993</td>
<td>134.52</td>
<td>56.08</td>
</tr>
</tbody>
</table>


* Foreign debt only.

2.3. BACKGROUND OF THE MALAYSIAN TAXATION SYSTEM

A. HISTORICAL BACKGROUND

The urgent need for the development of the country's infrastructure such as road, rail and port facilities led to the introduction of the earliest form of taxation in Malaysia in 1910. This was followed by a

---

10 In the form of indirect taxes on the main economic units.
tax on income in 1917\textsuperscript{11} which was then repealed in 1922. During World War II\textsuperscript{12}, a tax on profit and income was reimposed in the Straits Settlements. The act was renewed each year and the revenue raised was solely used for the purpose of imperial defense until 1945\textsuperscript{13}. In 1946\textsuperscript{14}, R.B. Hearsman was commissioned to recommend a tax system for Malaya (prior to Malaysia, which was formed in 1963). The principal objective of the taxation system introduced was to achieve a more equitable distribution of the tax burden besides generating revenue for the government. This marked the beginning of a new era in taxation on a permanent basis in Malaya\textsuperscript{15}.

B. TAX POLICY DEVELOPMENT

Until the mid-sixties, it was difficult to cite any evidence to support the contention that tax policy in Malaysia used to achieve any objective other than to raise revenue. In the past fifteen years however, the tax structure has increasingly been rationalised to achieve certain objectives. Taxes have therefore been used:

a) to promote investment and stimulate industrial development.

b) to promote national saving and improve the free flow of goods leaving the country through harmonization of tax rates between Peninsular Malaysia, Sabah and Sarawak.

\textsuperscript{11} As a temporary war measure.
\textsuperscript{12} Between 1941 - 1945.
\textsuperscript{13} When the war tax legislation lapsed.
\textsuperscript{14} Upon the establishment of the Malayan Union government.
\textsuperscript{15} See Edwards, 1970 for more details historical development of the taxation system in Malaya.
c) to promote a more equitable distribution of income and wealth through a somewhat progressive income tax structure and Real Property Gains tax.
d) to alleviate the burden of inflation especially on the lower income groups\textsuperscript{16}.

These have brought some sophistication into the tax system which resulted in the use of taxation as an important policy instrument other than for collecting government revenue.

Income taxation\textsuperscript{17} was scarcely 13\% of the total tax revenue in 1947. Its share in total revenue almost doubled to 25\% by 1965. In the same year, personal income tax contributed less than 10\% of the total tax revenue. Until about the early 70's, indirect taxes had always been the dominant source of tax revenue in Malaysia. The 1970's saw a marked change in the Malaysian tax structure\textsuperscript{18}. In 1975, income taxes accounted for 44.2\% of the total tax revenue. The proportion continued to increase until 1985\textsuperscript{19}. This shift towards reliance on income taxes rather than indirect taxation was more of a reflection of the changing economic structure than a conscious leaning towards the equity objectives\textsuperscript{20}. The role of customs duties has been declining since the early 70's\textsuperscript{21}. Excise duties and sales tax have been scaled down

\textsuperscript{16} Through the repeal of some indirect taxes.
\textsuperscript{17} Comprised of personal and corporate tax
\textsuperscript{18} In terms of each individual tax role in the tax revenue generation.
\textsuperscript{19} When the personal tax rate had been adjusted downwards. Refer to Table 2.6 for details.
\textsuperscript{20} Heavy reliance on income and other direct taxes appears to be a feature of developed countries' tax system.
\textsuperscript{21} From its contribution of 31\%, it has dwindled to
minimally\textsuperscript{22}. The shift in reliance away from indirect taxes as shown on Table 2.7 has resulted in a higher tax ratio\textsuperscript{23}.

There has been no major modification in the income tax system since its inception in 1947. Minor adjustments only occurred by extending the scope of income taxation\textsuperscript{24}. A significant change in the rate structure was introduced in 1984. The rates in personal income tax were reduced substantially\textsuperscript{25}. Other direct taxes were later introduced and subsequently repealed for various reasons\textsuperscript{26}. In an effort to insert development objectives into the tax system, incentives were provided for investment in chosen sectors of the economy.

C. DIRECT TAXES DEVELOPMENT

Direct taxes constituted approximately 47.8\% of the total government tax revenue in 1981, as shown on Table 2.6. It has risen substantially to record an average annual growth rate of 22.3\% over the last 25 years. Income tax - on both personal and corporate income - increased in its contribution to the tax revenue from 21\% in 1960 to 35\% in 1970, 41\% in 1980 and 46\% in 1986\textsuperscript{27}.

\begin{itemize}
  \item merely 23\% in 1986.
  \item Staying at 8\% each.
  \item That is, the ratio of tax collection to gross domestic product.
  \item From territorial to worldwide basis in 1967 and subsequently conversion back to the territorial scope and remittance basis in 1974.
  \item With a view to equalise the highest rate with that of the corporate tax rate.
  \item For details of the direct taxes development see, for example, Bardai, 1987.
  \item The increase in the income tax collection was due
\end{itemize}
This is partly due to the rapid expansion of employment and the increasing number of people earning salaries and wages above the minimum taxable income.

Income tax was at a peak of 49% of the total tax revenue in 1985. The government then decided to reduce the personal tax rate quite drastically primarily on the higher income group, to encourage saving in the economy. The significant increase of Petroleum income tax in the 1970's had also decreased the importance of the personal income tax. The corporate income tax had also fluctuated in the sixties, largely because of tin and rubber price variations as most companies then were foreign-owned, operating in the plantation and mining industries. Bear in mind that foreign shareholders do not pay personal income tax. Corporate tax had therefore been mostly borne by the foreign shareholders. By the 1970's and early 1980's, the fluctuation stabilised with an increase in the number of locally owned corporations, largely the manufacturing industries.

D. INDIRECT TAXES DEVELOPMENT

Indirect taxes which accounted for more than 75% of the total tax revenue in 1960 increased at an average annual rate of 6.7% in the sixties to 18.5% in the seventies. The relative contribution had however declined steadily. The rapid growth in indirect taxes was caused by the significant role played by the traditional taxes primarily to the introduction of the new taxes such as Development Taxes (1967), Tin Profit Tax (1967), Timber Profit Tax (1969) and Excess Profit Tax since 1970. The effectiveness of this measure was however quite uncertain.
introduced at that time\textsuperscript{29}. The role of indirect taxes declined over the years, from 75\% in 1960 to 53\% in 1981 to 50\% in 1986. Although taxes on foreign trade remained an important source of revenue, there has been a contraction in the shares of these taxes since the 1960's. Export and Import Taxes together accounted for about 70\% of the total tax revenue in the 1960's. This declined to a mere 42\% in the 1970's and 25\% in the 1980's. At the same time, taxes collected on production and sales of goods and services in the economy\textsuperscript{30} grew in significance. The growth in the number of domestic industries provided a new source of excise duty and broadened the tax base. The role of Sales Tax as a proportion of total tax had also arisen from 4.7\% in 1972 to 5.3\% in 1982 and 7.3\% in 1986. Service tax, which was introduced in 1975 to cover services rendered by hotels and similiar establishments was broadened to cover restaurants and fast foods chains with an exemption limit based on the establishment's estimated annual turnover.

2.4. PERFORMANCE AND STRUCTURE OF THE MALAYSIAN TAXATION

The Malaysian tax ratio\textsuperscript{31} has increased steadily since 1960 from 17\% in 1960 to 29\% in 1986. Malaysia was ranked sixth in a tax-ratio study for the period between 1972-1976 by The World Bank\textsuperscript{32}. This high ratio was the

\textsuperscript{29} This includes Import Surtax (1967), Rubber Export Surcharge (1970), Sales Tax (1972), Tin an Oil Export Surcharge (1974) and Service Tax (1975).

\textsuperscript{30} Namely Excise duty and Sales tax.

\textsuperscript{31} Tax revenue over gross domestic product.

\textsuperscript{32} Among forty seven countries selected in the study.
result of a high level of domestic income and the importance of exports in the Gross Domestic Product. The tax structure in the 1960’s and early 1970’s was dominated by taxes on foreign trade\textsuperscript{33}. The relative importance of indirect taxes in the total tax structure continued to diminish. In contrast, the importance of direct taxes continued to rise\textsuperscript{34}.

Several factors help explain the changing pattern in the tax structure.

a) The reduction in the over-dependence on two primary commodities, namely rubber and tin, resulting from the government’s diversification policy\textsuperscript{35}.

b) An emphasis on import substitution policy in the sixties led to the decreased importance of revenue from import taxes.

c) The rapid growth in revenue from direct taxes in the mid-seventies was also due to improved administrative tax collection machinery, expansion of the tax base and the upward adjustments in the rates structures of the individual and company income taxes.

d) The rapid internal growth and development during the 1970’s.

\textsuperscript{33} Resulting in substantial annual fluctuations especially in the indirect tax collection.

\textsuperscript{34} Mainly due to a rapid increase in the collection of income taxes.

\textsuperscript{35} Which led to a decline in the relative importance of export earnings from these commodities.
Table 2.5 shows the source and structure of the Malaysian government's revenue between 1985 and 1988.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>NON TAX REVENUE</td>
<td>4,414</td>
<td>4,836</td>
<td>5,670</td>
<td>6,760</td>
</tr>
<tr>
<td>TAX REVENUE:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal Income Tax</td>
<td>1,749</td>
<td>1,761</td>
<td>1,812</td>
<td>1,703</td>
</tr>
<tr>
<td>Corporate Income Tax</td>
<td>3,920</td>
<td>3,446</td>
<td>2,783</td>
<td>2,967</td>
</tr>
<tr>
<td>Petroleum Income Tax</td>
<td>3,130</td>
<td>3,072</td>
<td>1,533</td>
<td>1,998</td>
</tr>
<tr>
<td>Other direct taxes</td>
<td>460</td>
<td>374</td>
<td>339</td>
<td>331</td>
</tr>
<tr>
<td>Total Direct Taxes</td>
<td>9,259</td>
<td>8,653</td>
<td>6,467</td>
<td>6,999</td>
</tr>
<tr>
<td>Sales Tax</td>
<td>1,234</td>
<td>992</td>
<td>1,090</td>
<td>1,621</td>
</tr>
<tr>
<td>Service Tax</td>
<td>107</td>
<td>60</td>
<td>63</td>
<td>74</td>
</tr>
<tr>
<td>Export duties</td>
<td>1,837</td>
<td>2,141</td>
<td>1,267</td>
<td>1,813</td>
</tr>
<tr>
<td>Import Duties</td>
<td>2,518</td>
<td>2,066</td>
<td>1,934</td>
<td>2,814</td>
</tr>
<tr>
<td>Excise tax</td>
<td>1,379</td>
<td>1,410</td>
<td>1,310</td>
<td>3,538</td>
</tr>
<tr>
<td>Other Indirect taxes</td>
<td>367</td>
<td>360</td>
<td>342</td>
<td>619</td>
</tr>
<tr>
<td>Total indirect taxes</td>
<td>7,441</td>
<td>6,029</td>
<td>6,006</td>
<td>10,479</td>
</tr>
<tr>
<td>TOTAL TAX REVENUE</td>
<td>16,700</td>
<td>14,682</td>
<td>12,473</td>
<td>17,478</td>
</tr>
<tr>
<td>TOTAL REVENUE GENERATED</td>
<td>21,114</td>
<td>19,518</td>
<td>18,143</td>
<td>24,238</td>
</tr>
</tbody>
</table>

### TABLE 2.6.

DIRECT TAXES AS PERCENTAGE OF FEDERAL REVENUE

( in percentage )

<table>
<thead>
<tr>
<th>Year</th>
<th>Companies income tax</th>
<th>Individual income tax</th>
<th>Petroleum income tax</th>
<th>Petroleum royalties</th>
<th>Total direct tax</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960</td>
<td>15.8</td>
<td>5.3</td>
<td>-</td>
<td>-</td>
<td>21.6</td>
</tr>
<tr>
<td>1965</td>
<td>17.5</td>
<td>7.5</td>
<td>-</td>
<td>-</td>
<td>27.1</td>
</tr>
<tr>
<td>1970</td>
<td>24.5</td>
<td>8.4</td>
<td>-</td>
<td>-</td>
<td>35.0</td>
</tr>
<tr>
<td>1975</td>
<td>25.5</td>
<td>9.6</td>
<td>-</td>
<td>-</td>
<td>44.2</td>
</tr>
<tr>
<td>1979</td>
<td>18.1</td>
<td>11.9</td>
<td>-</td>
<td>-</td>
<td>40.9</td>
</tr>
<tr>
<td>1980</td>
<td>19.8</td>
<td>7.6</td>
<td>13.5</td>
<td>2.6</td>
<td>44.3</td>
</tr>
<tr>
<td>1981</td>
<td>22.2</td>
<td>8.6</td>
<td>13.1</td>
<td>2.8</td>
<td>47.8</td>
</tr>
<tr>
<td>1982</td>
<td>23.3</td>
<td>9.0</td>
<td>14.5</td>
<td>2.5</td>
<td>50.0</td>
</tr>
<tr>
<td>1983</td>
<td>21.2</td>
<td>11.1</td>
<td>12.3</td>
<td>3.0</td>
<td>48.3</td>
</tr>
<tr>
<td>1984</td>
<td>19.5</td>
<td>11.2</td>
<td>14.6</td>
<td>3.3</td>
<td>49.2</td>
</tr>
<tr>
<td>1985</td>
<td>20.2</td>
<td>9.8</td>
<td>17.7</td>
<td>3.1</td>
<td>51.6</td>
</tr>
<tr>
<td>1986</td>
<td>21.3</td>
<td>9.6</td>
<td>14.5</td>
<td>3.4</td>
<td>49.7</td>
</tr>
<tr>
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<td>20.1</td>
<td>13.7</td>
<td>12.2</td>
<td>2.9</td>
<td>48.9</td>
</tr>
<tr>
<td>1988</td>
<td>18.3</td>
<td>12.7</td>
<td>15.1</td>
<td>3.0</td>
<td>49.1</td>
</tr>
</tbody>
</table>

Source: Compiled from Annual Economics Report of Malaysia
<table>
<thead>
<tr>
<th>Year</th>
<th>Export duties</th>
<th>Import duties and surtax</th>
<th>Excise tax</th>
<th>Sales tax</th>
<th>Road tax</th>
<th>Other tax</th>
<th>Total indirect tax</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960</td>
<td>29.4</td>
<td>40.0</td>
<td>0.9</td>
<td>-</td>
<td>6.2</td>
<td>0.2</td>
<td>78.4</td>
</tr>
<tr>
<td>1965</td>
<td>19.9</td>
<td>40.1</td>
<td>0.8</td>
<td>-</td>
<td>7.3</td>
<td>0.5</td>
<td>72.5</td>
</tr>
<tr>
<td>1970</td>
<td>14.0</td>
<td>27.9</td>
<td>12.5</td>
<td>-</td>
<td>8.5</td>
<td>2.8</td>
<td>65.0</td>
</tr>
<tr>
<td>1975</td>
<td>13.7</td>
<td>17.5</td>
<td>9.3</td>
<td>5.9</td>
<td>5.3</td>
<td>2.1</td>
<td>55.8</td>
</tr>
<tr>
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<td>20.4</td>
<td>15.9</td>
<td>10.1</td>
<td>5.7</td>
<td>3.6</td>
<td>1.9</td>
<td>59.1</td>
</tr>
<tr>
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<td>20.2</td>
<td>15.9</td>
<td>7.6</td>
<td>5.4</td>
<td>3.0</td>
<td>2.2</td>
<td>52.7</td>
</tr>
<tr>
<td>1981</td>
<td>16.5</td>
<td>16.1</td>
<td>7.5</td>
<td>5.2</td>
<td>3.3</td>
<td>2.2</td>
<td>52.7</td>
</tr>
<tr>
<td>1982</td>
<td>16.1</td>
<td>14.6</td>
<td>6.7</td>
<td>5.3</td>
<td>3.2</td>
<td>2.4</td>
<td>50.0</td>
</tr>
<tr>
<td>1983</td>
<td>11.6</td>
<td>15.9</td>
<td>8.4</td>
<td>7.8</td>
<td>3.3</td>
<td>0.7</td>
<td>51.7</td>
</tr>
<tr>
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<td>11.8</td>
<td>15.3</td>
<td>8.3</td>
<td>7.5</td>
<td>3.4</td>
<td>0.6</td>
<td>50.9</td>
</tr>
<tr>
<td>1985</td>
<td>10.0</td>
<td>14.9</td>
<td>8.3</td>
<td>7.4</td>
<td>3.4</td>
<td>0.8</td>
<td>48.5</td>
</tr>
<tr>
<td>1986</td>
<td>9.7</td>
<td>15.4</td>
<td>8.9</td>
<td>7.3</td>
<td>3.5</td>
<td>0.9</td>
<td>50.7</td>
</tr>
<tr>
<td>1987</td>
<td>10.2</td>
<td>15.8</td>
<td>11.4</td>
<td>8.5</td>
<td>3.3</td>
<td>0.7</td>
<td>49.9</td>
</tr>
<tr>
<td>1988</td>
<td>10.1</td>
<td>17.4</td>
<td>11.3</td>
<td>7.9</td>
<td>3.6</td>
<td>0.6</td>
<td>50.9</td>
</tr>
</tbody>
</table>

Source: Compiled from Annual Economics Reports of Malaysia
A. TAX STRUCTURES BASED ON THE BENCHMARK DATA SETS

The Malaysian tax structure was slightly readjusted and presented to balance the National Accounts for purposes of the benchmark equilibrium data set. The following three Tables (2.8 - 2.10) describe the tax structure assumed in the model.36

The total tax collected and the significance of each of the taxes in the economy are presented in Table 2.8 below. Corporate taxes, Payroll taxes and the Import taxes had been the most productive taxes in the economy which when grouped together produced nearly 60% of the total tax revenue. Corporate and Payroll taxes contributed to more than 49% of the total tax revenue which reflected the significant importance of the direct taxes in the economy.

In discussing tax structures in relation to the benchmark equilibrium data set as shown on Table 2.8, it is important to qualify the nature of Payroll tax. Payroll tax here actually represent the Employees Provident funds (EPF). It is divided into two categories, namely, the Employers contribution of 11% of gross income and the Employees contribution of 9%. Only the former portion had been evaluated specifically as the Payroll tax. The latter portion had been lumped together with the Income taxes and regarded as part of income taxes. In our model and in the benchmark data set, both portions of EPF have been defined as part of the tax revenue source of

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36 There were no significant differences between the real data above and the data used for the model. The main deviation is in classification, which had to be adjusted in the case of the benchmark data set parallel with the tax instruments introduced in the model.
the government for two reasons. First, these funds have always been used for the purchase of government securities, which made it as accessible as other tax revenues. Secondly, there are some non tax revenues of the government from royalties, fees etc, (which exactly matched the EPF collection in 1988). The EPF collection would therefore represent this source as well.

In a real sense, however, the EPF is more of a consumption-smoothing device and a provision for future consumption. A change in the EPF contribution could therefore be expected to change households' behaviour in terms of their present consumption. This impact on behavioural changes has been assumed to be quite mild and can be overlooked in a marginal analysis of this nature, as long as we are cautious enough in interpreting the result.

Income taxes produced less than 6% of the total tax revenue. This reflected the small role it played in comparison to the total effort required to collect them. The Sales and services taxes only contributed to about 22% of the total tax revenue.
<table>
<thead>
<tr>
<th>Tax instruments</th>
<th>Vol. of tax (M$ million)</th>
<th>% tax rev</th>
<th>Eff. rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales tax - Food</td>
<td>147.094</td>
<td>0.6230</td>
<td>0.76716</td>
</tr>
<tr>
<td>Sales tax - Beverage and tobacco</td>
<td>1,130.690</td>
<td>4.7889</td>
<td>55.48745</td>
</tr>
<tr>
<td>Sales tax - Clothing and footwear</td>
<td>160.004</td>
<td>0.6777</td>
<td>3.39961</td>
</tr>
<tr>
<td>Sales tax - Manufacturing durables</td>
<td>931.626</td>
<td>3.9458</td>
<td>3.15699</td>
</tr>
<tr>
<td>Service tax - Household services</td>
<td>105.129</td>
<td>0.4453</td>
<td>1.02280</td>
</tr>
<tr>
<td>Sales tax - Other goods</td>
<td>2,632.883</td>
<td>11.1514</td>
<td>13.72566</td>
</tr>
<tr>
<td>Prod.tax - Primary commodities</td>
<td>198.000</td>
<td>0.8386</td>
<td>0.56078</td>
</tr>
<tr>
<td>Excise tax - Petroleum</td>
<td>636.000</td>
<td>2.6937</td>
<td>5.28766</td>
</tr>
<tr>
<td>Export taxes</td>
<td>1,625.503</td>
<td>6.8847</td>
<td>2.85658</td>
</tr>
<tr>
<td>Import taxes</td>
<td>2,949.630</td>
<td>12.4929</td>
<td>6.46747</td>
</tr>
<tr>
<td>TOTAL INDIRECT TAXES</td>
<td>10,516.595</td>
<td>44.5422</td>
<td>3.52929</td>
</tr>
<tr>
<td>Corporate taxes</td>
<td>5,617.313</td>
<td>23.7930</td>
<td>12.20797</td>
</tr>
<tr>
<td>Payroll tax - Employees provident funds</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>- employees</td>
<td>2,749.617</td>
<td>11.6458</td>
<td>9.00000</td>
</tr>
<tr>
<td>- employers</td>
<td>3,360.643</td>
<td>14.2337</td>
<td>11.00000</td>
</tr>
<tr>
<td>Total</td>
<td>6,110.260</td>
<td>25.8795</td>
<td>20.00000</td>
</tr>
<tr>
<td>Income taxes:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Informal group</td>
<td>0.000</td>
<td>0.0000</td>
<td>0.00000</td>
</tr>
<tr>
<td>- Low income group</td>
<td>125.026</td>
<td>0.5295</td>
<td>1.18050</td>
</tr>
<tr>
<td>- Middle income group</td>
<td>200.891</td>
<td>0.8509</td>
<td>3.90784</td>
</tr>
<tr>
<td>- High income group</td>
<td>428.941</td>
<td>1.8167</td>
<td>14.60076</td>
</tr>
<tr>
<td>- Top brackets</td>
<td>476.895</td>
<td>2.0199</td>
<td>28.90150</td>
</tr>
<tr>
<td>- Entrepreneurs</td>
<td>134.165</td>
<td>0.5682</td>
<td>4.46383</td>
</tr>
<tr>
<td>Total</td>
<td>1,365,918</td>
<td>5.7852</td>
<td>3.89043</td>
</tr>
<tr>
<td>Total direct taxes</td>
<td>13,093.791</td>
<td>55.7852</td>
<td>3.89043</td>
</tr>
<tr>
<td>Grand total</td>
<td>23,610.386</td>
<td>100.0000</td>
<td>5.69177</td>
</tr>
</tbody>
</table>

Source: Constructed from benchmark data set used in the model.
B. EXPENDITURES AND INCOME STRUCTURES OF FIRMS AND HOUSEHOLDS IN MALAYSIA IN 1988

I. TAXES ON FIRMS

The total expenditures of firms and the effective tax rates of firms for 1988 are shown below.

<table>
<thead>
<tr>
<th>Sector</th>
<th>Trading value (M$ MILLIONS)</th>
<th>Taxes paid (M$)</th>
<th>Effective tax rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foods</td>
<td>19,173.800</td>
<td>147.094</td>
<td>0.7672</td>
</tr>
<tr>
<td>Beverage and tobacco</td>
<td>2,037.740</td>
<td>1,130.690</td>
<td>55.4875</td>
</tr>
<tr>
<td>Clothing and footwear</td>
<td>4,706.540</td>
<td>160.004</td>
<td>3.3996</td>
</tr>
<tr>
<td>Manufacturing durables</td>
<td>29,509.900</td>
<td>931.626</td>
<td>3.1570</td>
</tr>
<tr>
<td>Household services</td>
<td>10,278.500</td>
<td>105.129</td>
<td>1.0228</td>
</tr>
<tr>
<td>Investment goods</td>
<td>19,182.200</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Other goods</td>
<td>32,855.500</td>
<td>2,632.880</td>
<td>8.0135</td>
</tr>
<tr>
<td>Petroleum</td>
<td>12,028.000</td>
<td>1,784.000</td>
<td>14.8321</td>
</tr>
<tr>
<td>Other services</td>
<td>30,389.400</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Primary Commodities</td>
<td>35,307.900</td>
<td>265.000</td>
<td>0.7505</td>
</tr>
<tr>
<td>Exports</td>
<td>32,555.750</td>
<td>1,625.503</td>
<td>4.9930</td>
</tr>
<tr>
<td>Import</td>
<td>45,607.160</td>
<td>2,949.636</td>
<td>6.4675</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>273,632,390</strong></td>
<td><strong>11,731,562</strong></td>
<td><strong>4.2873</strong></td>
</tr>
</tbody>
</table>

Source: Constructed from benchmark data set used in the model.

Beverage and tobacco are very heavily taxed despite small consumption. On the other hand, other services are not taxed at all, although their consumption is quite
substantial. Manufacturing durables, household services and other goods are only taxed at low rates in spite of their high consumption volume. This actually provides a potential avenue for tax revenue expansion in the future. Import taxes have been kept relatively low. Petroleum taxes form quite a substantial portion of indirect taxes since export tax on petroleum has been included in it\textsuperscript{37}.

II. TAXES ON HOUSEHOLDS SECTOR

Income, expenditures and taxes incurred by the household sector are shown in Table 2.10 below.

\textsuperscript{37} Bear in mind that in the case of primary commodities and petroleum products, double counting occurred because export taxes includes tax on primary commodities and petroleum products exported.
<table>
<thead>
<tr>
<th>Classes</th>
<th>Value of expenditure</th>
<th>Total income</th>
<th>Taxes paid</th>
<th>Average effective rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public sector</td>
<td>11,314.920</td>
<td>-</td>
<td>728.860</td>
<td>6.44158</td>
</tr>
<tr>
<td>Informal labour</td>
<td>15,769.670</td>
<td>15,359.600</td>
<td>407.245</td>
<td>2.65140</td>
</tr>
<tr>
<td>Low income</td>
<td>11,433.010</td>
<td>11,433.100</td>
<td>1,302.445</td>
<td>11.39188</td>
</tr>
<tr>
<td>Medium income</td>
<td>9,905.181</td>
<td>9,905.100</td>
<td>801.821</td>
<td>8.09503</td>
</tr>
<tr>
<td>High income</td>
<td>17,100.550</td>
<td>17,100.600</td>
<td>807.700</td>
<td>4.72323</td>
</tr>
<tr>
<td>Top brackets</td>
<td>7,184.726</td>
<td>7,452.660</td>
<td>716.179</td>
<td>9.60971</td>
</tr>
<tr>
<td>Entrepreneurs</td>
<td>4,181.369</td>
<td>7,928.600</td>
<td>487.397</td>
<td>6.14733</td>
</tr>
<tr>
<td>Foreign sector</td>
<td>56,903.850</td>
<td>11,946.000</td>
<td>2,840.503</td>
<td>23.77786</td>
</tr>
<tr>
<td>Total</td>
<td>125,542.300</td>
<td>81,125.660</td>
<td>8,092.150</td>
<td>13.55930</td>
</tr>
</tbody>
</table>

Source: Constructed from benchmark data set used in the model.

* This figure represent average rate of taxes on households.

The average effective income tax rates were quite high. The Public sector had to pay payroll taxes on their wage bills at quite substantial rates. The foreign sector was taxed on their import of primary commodities and income from dividend received in the Malaysian corporate investment.\(^{38}\)

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\(^{38}\) In the case of these two groups of households, effective tax rates were calculated as a percentage of expenditures rather than income, simply because taxes on consumption are more relevant here. Total taxes on the firms sectors - on Table 2.9 plus total taxes on the households - on Table 2.10, do not tally with the total taxes collected as described on Table 2.8 because of double counting of taxes. Taxes suffered by the foreigners include some portion of export taxes and corporate taxes.
C. DISTRIBUTIONAL IMPACT OF THE TAX SYSTEM.

An incidence study on taxation in Malaysia was last carried out in 1973. It was based on a survey conducted by Ismail Salleh (1975) on 7,600 households in the West Malaysia over which distribution of household income by income classes was determined. The 1973 tax burden for each individual taxes was then allocated to the households income classes based on the normal tax incidence assumptions\textsuperscript{39}. The following are a summary of the results of the incidence studies.

I. TAX BURDEN DISTRIBUTION OF PRIVATE HOUSEHOLD IN MALAYSIA IN 1973

The estimated distribution of tax burdens by income groups for West Malaysia is presented in Table 2.12.

Overall, the burden of taxes was regressive, with the lowest income group in the economy being taxed at an average rate of 58\%. For median and the high income groups on the other hand, tax burden is an average effective rate of 36\% and 37\% respectively. Even the richest taxpayers, i.e. entrepreneurs, were paying approximately 10\% less than the poorest group in the economy\textsuperscript{40}. Interestingly, all groups of households had spent quite a high proportion of their income on taxes.

\textsuperscript{39} Generated from earlier studies obtained from the tax literature. Pechman and Okner of the Brookings Institute in their work on the incidence of taxes in the United States in 1985, assumed that all taxes imposed directly on labour are not shifted and that sales (and other indirect) taxes are borne only by consumers. Half of the corporation tax is assumed to have been borne by the shareholders.

\textsuperscript{40} even though they harbor quite a substantial overall effective tax rate of 45\%.
Looking at each individual tax, the informal labour group was again found to be the worst affected. The highest tax borne was sales tax on other goods. Informal labour also paid high taxes on imported goods and payroll tax. As expected, the burden of primary commodities taxes and Sales tax on beverage & tobacco exacted a heavy on the informal labour group.

41 Employee Provident Funds (EPF).
### TABLE 2.11.

**TAX BURDEN AS PERCENTAGE OF HOUSEHOLDS INCOME IN 1973**

<table>
<thead>
<tr>
<th>Income class</th>
<th>Sale tax Food</th>
<th>Sale tax B &amp; T</th>
<th>Sale tax C &amp; F</th>
<th>Sale tax M.Dur</th>
<th>Serv. tax H.ser</th>
<th>Sale tax O.gds</th>
<th>Exc. tax P.com</th>
<th>Exp. tax P.com</th>
</tr>
</thead>
<tbody>
<tr>
<td>Informal lab.</td>
<td>1.52</td>
<td>5.67</td>
<td>1.31</td>
<td>3.41</td>
<td>-</td>
<td>11.75</td>
<td>0.89</td>
<td>4.80</td>
</tr>
<tr>
<td>Low income</td>
<td>0.78</td>
<td>4.33</td>
<td>0.89</td>
<td>2.77</td>
<td>-</td>
<td>8.99</td>
<td>0.70</td>
<td>3.78</td>
</tr>
<tr>
<td>Middle income</td>
<td>0.42</td>
<td>3.51</td>
<td>0.77</td>
<td>2.45</td>
<td>-</td>
<td>8.09</td>
<td>0.33</td>
<td>1.75</td>
</tr>
<tr>
<td>High income</td>
<td>0.25</td>
<td>2.69</td>
<td>0.73</td>
<td>2.35</td>
<td>-</td>
<td>8.66</td>
<td>0.19</td>
<td>1.01</td>
</tr>
<tr>
<td>Top brackets</td>
<td>0.18</td>
<td>2.17</td>
<td>0.67</td>
<td>2.31</td>
<td>-</td>
<td>9.35</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Entrepreneurs</td>
<td>0.05</td>
<td>1.24</td>
<td>0.35</td>
<td>1.42</td>
<td>-</td>
<td>5.85</td>
<td>1.25</td>
<td>6.78</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3.20</strong></td>
<td><strong>19.61</strong></td>
<td><strong>4.72</strong></td>
<td><strong>14.71</strong></td>
<td><strong>-</strong></td>
<td><strong>52.69</strong></td>
<td><strong>3.36</strong></td>
<td><strong>18.12</strong></td>
</tr>
</tbody>
</table>

**TABLE 2.11 (CONTINUED)**

<table>
<thead>
<tr>
<th>Tax on:</th>
<th>Inc. Tax Unsk</th>
<th>Inc. Tax SSk1</th>
<th>Inc. Tax Skld</th>
<th>Inc. Tax Tmgm</th>
<th>Corp Tax</th>
<th>Impt Tax</th>
<th>Payr Tax (EPF)</th>
<th>Total tax burden</th>
</tr>
</thead>
<tbody>
<tr>
<td>Informal lab.</td>
<td>3.99</td>
<td></td>
<td></td>
<td></td>
<td>4.90</td>
<td>9.47</td>
<td>9.83</td>
<td>58.35</td>
</tr>
<tr>
<td>Low income</td>
<td>3.88</td>
<td></td>
<td></td>
<td></td>
<td>3.99</td>
<td>7.9</td>
<td>12.3</td>
<td>50.30</td>
</tr>
<tr>
<td>Medium income</td>
<td>3.88</td>
<td></td>
<td></td>
<td></td>
<td>3.64</td>
<td>7.2</td>
<td>4.51</td>
<td>36.48</td>
</tr>
<tr>
<td>High income</td>
<td></td>
<td></td>
<td>5.3</td>
<td></td>
<td>3.74</td>
<td>7.4</td>
<td>4.71</td>
<td>37.02</td>
</tr>
<tr>
<td>Top brackets</td>
<td></td>
<td></td>
<td></td>
<td>7.8</td>
<td>4.57</td>
<td>7.6</td>
<td>3.86</td>
<td>38.39</td>
</tr>
<tr>
<td>Entrepreneurs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>15.5</td>
<td>7.09</td>
<td>4.77</td>
<td>45.34</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>8.79</strong></td>
<td><strong>3.88</strong></td>
<td><strong>5.3</strong></td>
<td><strong>7.8</strong></td>
<td><strong>15.5</strong></td>
<td><strong>27.9</strong></td>
<td><strong>28.6</strong></td>
<td><strong>36.3</strong></td>
</tr>
</tbody>
</table>

### TABLE 2.12.

**TAX BURDEN DISTRIBUTION OF THE INCOME GROUPS IN 1973**

( in percentage )

<table>
<thead>
<tr>
<th>Income class</th>
<th>Sale tax Food</th>
<th>Sale tax B &amp; T</th>
<th>Sale tax C &amp; F</th>
<th>Sale tax M. Dur</th>
<th>Serv. tax H. ser</th>
<th>Sale tax O.gds</th>
<th>Exc. tax P.com</th>
<th>Exp. tax P.com</th>
</tr>
</thead>
<tbody>
<tr>
<td>Informal lab.</td>
<td>17.78</td>
<td>8.27</td>
<td>7.76</td>
<td>6.95</td>
<td>-</td>
<td>5.64</td>
<td>4.05</td>
<td>7.41</td>
</tr>
<tr>
<td>Low income</td>
<td>27.50</td>
<td>19.44</td>
<td>17.55</td>
<td>16.94</td>
<td>-</td>
<td>13.78</td>
<td>9.66</td>
<td>15.29</td>
</tr>
<tr>
<td>Middle income</td>
<td>31.69</td>
<td>33.01</td>
<td>29.31</td>
<td>30.11</td>
<td>-</td>
<td>24.89</td>
<td>9.35</td>
<td>14.80</td>
</tr>
<tr>
<td>High income</td>
<td>11.53</td>
<td>15.39</td>
<td>16.68</td>
<td>16.08</td>
<td>-</td>
<td>22.06</td>
<td>4.05</td>
<td>6.41</td>
</tr>
<tr>
<td>Top brackets</td>
<td>7.14</td>
<td>11.48</td>
<td>14.49</td>
<td>14.01</td>
<td>-</td>
<td>15.04</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Entrepreneurs</td>
<td>4.36</td>
<td>12.41</td>
<td>14.21</td>
<td>15.91</td>
<td>-</td>
<td>18.77</td>
<td>39.33</td>
<td>21.23</td>
</tr>
<tr>
<td>Foreigners</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>33.56</td>
<td>34.86</td>
</tr>
</tbody>
</table>

| Total               | 100           | 100            | 100            | 100              | 0                | 100            | 100            | 100            |

### TABLE 2.12 ( CONTINUED )

<table>
<thead>
<tr>
<th>Income class</th>
<th>Inc. Unsk lab.</th>
<th>Inc. Skl lab.</th>
<th>Inc. Tax Top mgmt</th>
<th>Inc. Tax Entrprnr</th>
<th>Corp Tax</th>
<th>Impt Tax</th>
<th>Payr Tax</th>
<th>EPF</th>
<th>Lump Sum Tax</th>
</tr>
</thead>
<tbody>
<tr>
<td>Informal lab.</td>
<td>5.05</td>
<td>9.84</td>
<td>7.00</td>
<td>9.86</td>
<td>2.81</td>
<td>5.62</td>
<td>8.55</td>
<td>32.1</td>
<td></td>
</tr>
<tr>
<td>Low income</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7.21</td>
<td>14.4</td>
<td>25.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medium income</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>13.6</td>
<td>27.2</td>
<td>25.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High income</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>8.38</td>
<td>16.7</td>
<td>15.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Top brackets</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10.4</td>
<td>16.5</td>
<td>12.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Entrepreneurs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>43.6</td>
<td>28.6</td>
<td>19.4</td>
<td>6.23</td>
<td></td>
</tr>
<tr>
<td>Foreigners</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>22.7</td>
<td>29.0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

| Total               |                |               |                   |                   | 100      | 100      | 100      |      |              |

The other way of analysing the effective tax burden on the household is by looking at the percentage of each of the taxes suffered by the various class of taxpayers.

Examining the Sales taxes first, the middle income group harbor the highest proportion of taxes in all tax scenarios. The resulting tax distribution was relatively regressive. In the case of Sales tax on food, the two top income groups bear the least proportion of taxes. Overall, sales tax is regressive with the middle income group bearing the higher proportions of tax\textsuperscript{42}.

Surprisingly, in the case of Excise tax on primary commodities, the top brackets group and the foreign household were found to have the highest proportion of the taxes. The same pattern was also exhibited in the case of Corporate taxes. These phenomena are crucial in determining the final burden of distribution, as these taxes were quite substantial in volume in relation to the total tax revenue.

Payroll tax was found to be regressive with the low and middle income groups Shouldering more than 55\% of the total taxes. Import tax was also weighted heavily on the medium income group. These taxes were also quite substantial in volume which would determine the overall regressive pattern observed in the economy.

The regressive pattern in the overall tax distribution was quite distinct in 1973. As most taxes still in existence exhibit little changes in their statutes, procedures and tax base coverage, it is

\textsuperscript{42} The overall impact was comparatively mild as the actual volume of taxes collected were relatively small.
expected that the above distribution pattern would still persist.

In summary, we noted that the crucial progressive elements in the Malaysian tax structure could be traced back to individual income tax, corporation income tax and export duty on tin. However, as more than 50% of the total tax revenue is derived from indirect taxes whose burden distribution is strongly regressive at the lower end of the income scale, this would have greater effect on the relative burden distribution of the total tax system in Malaysia.

The present tax burden distribution can be extrapolated by identifying changes that have occurred in the system since 1973. Most crucial is the marked increase in the importance of direct taxes\(^{43}\). Export duties have declined in relative importance\(^{44}\) and are slowly disappearing from the structure. Import taxes have also declined in importance\(^{45}\) producing a corrective burden distribution. Excise tax has however grown significantly. Sales Tax has declined in percentage and real terms, producing a further correction in the burden distribution. To conclude, the increased reliance on direct taxes would augment progressivity at the upper income classes. The decrease in the relative importance of indirect taxes reduces the regressive tendencies and thus helps to reduce the regressivity in the overall tax burden.

---

\(^{43}\) Primarily evidenced by the substantial increase in the tax revenue collected from income tax from petroleum industry in Malaysia.

\(^{44}\) reflecting the weak world commodity market.

\(^{45}\) in percentage and value.
II. TAX REVENUE BUOYANCIES

Revenue buoyancy\(^1\) could provide clues on the health of the tax system. The buoyancies of Malaysian tax revenue can be observed from Table 1.14 below. There has been a substantial decline in the buoyancies of indirect taxes. This could be explained by the reduction in the export duty\(^2\). Import duty buoyancies have also declined because of the change in the structure of imports and the extension of liberal exemptions. A reduction in the number of excises in 1982 and the application of specific rather than \textit{ad valorem} levies has also deteriorated the excise taxes yields.

III. TREND IN THE MALAYSIAN TAX SYSTEM

Malaysia has moved a long way from the normal tax features found in under developed and developing countries\(^3\). The rate of change from a heavy reliance on indirect to direct taxes has been dramatic\(^4\). This trend, however, has reversed since 1985, reflecting a new emphasis on efficiency in the tax system rather than equity or income distribution. The last three budgets\(^5\)

\(^1\) Defined as the responsiveness of changes in the tax revenue as a result of the change in the gross domestic product.
\(^2\) As a result of the fall in export value during the international recession since 1981.
\(^3\) Which rely heavily on indirect taxes.
### TABLE 2.13.

MALAYSIAN TAX REVENUE BUOYANCIES  
1971 - 1984

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Corporation tax</td>
<td>-</td>
<td>0.76</td>
<td>0.76</td>
</tr>
<tr>
<td>Personal tax</td>
<td>-</td>
<td>1.22</td>
<td>1.22</td>
</tr>
<tr>
<td><strong>INCOME TAX</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.44</td>
<td>1.55</td>
<td>1.23</td>
</tr>
<tr>
<td>Sales tax</td>
<td>-</td>
<td>1.18</td>
<td>1.18</td>
</tr>
<tr>
<td>Excise tax</td>
<td>1.02</td>
<td>1.27</td>
<td>0.78</td>
</tr>
<tr>
<td>Road tax</td>
<td>0.54</td>
<td>0.92</td>
<td>0.63</td>
</tr>
<tr>
<td>Export tax:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>with respect to GDP</td>
<td>1.33</td>
<td>1.35</td>
<td>1.03</td>
</tr>
<tr>
<td>with respect to export</td>
<td>1.26</td>
<td>1.26</td>
<td>1.19</td>
</tr>
<tr>
<td>Import duties:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>with respect to GDP</td>
<td>0.77</td>
<td>1.16</td>
<td>0.95</td>
</tr>
<tr>
<td>with respect to import</td>
<td>0.66</td>
<td>0.82</td>
<td>0.76</td>
</tr>
<tr>
<td><strong>INDIRECT TAX</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.14</td>
<td>0.93</td>
<td>1.07</td>
</tr>
<tr>
<td><strong>TOTAL TAX REVENUE</strong></td>
<td>1.21</td>
<td>1.35</td>
<td>0.99</td>
</tr>
<tr>
<td><strong>TOTAL TAX REVENUE</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( NON-OIL )</td>
<td>-</td>
<td>-</td>
<td>0.69</td>
</tr>
<tr>
<td><strong>TOTAL REVENUE</strong></td>
<td>1.20</td>
<td>1.21</td>
<td>1.14</td>
</tr>
</tbody>
</table>


Tax revenue buoyancies were estimated as:

\[
\log X = a + b \log Y
\]

**X** - tax revenue  
**Y** - gross domestic product  
**b** - revenue buoyancies
emphasised reform in indirect taxes.  

2.5. THE 1988 MALAYSIAN TAX REFORM PROPOSALS  

A. OVERALL WEAKNESSES OF THE PRESENT TAX SYSTEM  

Most tax system will have some glaring loopholes, structural defects or even fundamental flaws in the framework. These often occur because of an environmental change or the objectives of the tax system itself change. Before plunging into the reform proposal itself, it would be useful to identify some of the major weaknesses in the current tax system. This analysis essentially relates to the quest for tax equity, minimisation of distortions and facilitation of tax administration. The tax system is also regarded as an economic instrument to ensure continuous rapid growth in the economy. Finally, the role of the tax system in generating government revenue must not be overlooked, realising its substantial contribution and the fact that Malaysia shouldered a deficit budget for nearly a decade.  

(a) STRUCTURAL PROBLEM  

The tax system experienced a major change in its structure; from a system that relied heavily on indirect taxes for convenient tax revenue generation to direct taxes in order to achieve equity or income distribution objectives. As it was about to settle, another wave in the tax system shifted the attention back to indirect

---

6 Which would help politically in gaining acceptability of the Finance minister's budget policy, especially from the business community.  
7 When it was first established in 1947.
taxes, this time with efficiency objectives\(^8\). The future direction is however unclear, as the system still retains some indirect taxes which are known to have created distortion.

(b) EROSION IN THE TAX BASE

Tax base will not only determine the volume of tax revenue generated but also equity and efficiency in a tax system. The theoretical objective of a tax system is normally to achieve a comprehensive tax base. As described earlier, there are a lot of exemptions, exclusions and concessions provided in the system which make it inefficient and inequitable. Some improvement in the definition of tax base should be aimed not only to improve efficiency and equity but also to improve tax revenue generation.

(c) COMPLEXITY AND INEFFICIENCY IN THE TAX ASSESSMENT AND COLLECTION

The tax system and the statute is complicated with incentives, exemptions, exclusions and special provisions. For a tax system to be administratively efficient, it must be as simple and convenient as possible\(^9\). Even though the tax system is essentially 'global' in nature, there still exist a lot of 'schedular' elements in the system which would complicate assessment. The difference between the assessment and

\(^8\) i.e. in an attempt to minimise distortion in the economic activities.

\(^9\) Not only to the administrators but also the agents and taxpayers.
collection period, for example, handicap the system\textsuperscript{10}. The method of assessment is still unable to penetrate the informal sector, including small businesses, effectively.

(d) REDISTRIBUTION OBJECTIVE AND THE TAX SYSTEM

How wealth redistribution objective in the economy\textsuperscript{11} is to be accomplished through the tax system is debatable. It can be argued that the redistribution objective should be achieved best through the expenditure side of the government budget rather than the tax system itself\textsuperscript{12}. It should be noted, however, that public expenditure could also produce distortion. Administrative inefficiency in the social security for example could have a worse effect than the present distortionary income taxes. We could try to weed out most elements of progressiveness in the tax system, if we include in the reform, the structure and strategy of government expenditure. A system of subsidy targeted at the lower income group to supplement the income taxes could, in general, reduce the progressive impact of the tax system.

\textsuperscript{10} Because of the mismatch between the period when national income is being created and the period of tax collection. (Taxes for the current year will normally be assessed in February of the next year and collected in April of that year. This means businesses would only suffer tax in the following year after income had been earned).
\textsuperscript{11} which is crucial in achieving the national social restructuring objective.
\textsuperscript{12} To avoid distortion.
(e) TAXATION AND INCENTIVES TO PROMOTE FOREIGN INVESTMENT

As a developing nation which is growing rapidly, Malaysia has to attract investment by providing the best environment to cultivate investment. Taxation and investment incentive programs are considered to be among the crucial elements in attracting foreign investment. As effects of investment incentives are unclear, the tax system itself must be designed to harmonise, if not compete, with neighbouring countries. Realising that the Income Tax rate for individuals and corporations in Malaysia is still regarded as one of the highest in ASEAN, Malaysia needs to consider lowering it to make her position more competitive in the region. Investment tax incentive programs on the other hand must be reformed to reduce inefficiency and waste and improve its effectiveness.

B. OBJECTIVE OF THE 1988 TAX REFORM

There were basically four basic objectives identified by the Tax Reform Group.

(a) REVENUE GENERATION

Even though most tax reforms around the globe aim for revenue neutrality and improved efficiency, the tax reform team still felt there were strong justifications to aim for additional revenue out of the reform. The contention were based on the following evidence:

\[13\] And compete in all aspects with her neighbouring countries who are also moving at the same pace if not faster.
i) DECLINING TAX RATIO (TAX TO GDP)

Tax as a proportion of GDP and total government expenditure has declined over the years as shown on Table 2.14. This needs to be reversed, at least to the 1984 level in order to improve tax revenue productivity. This is necessary for maintaining the current government expenditure level and stabilising the macro economic structure of the country.

ii) TAX BOUYANCIES

Tax buoyancy, which ensures the responsiveness of revenue to changes in GDP, has declined particularly for excise duties. The gap between expenditure and total tax revenue buoyancy has moved from 0.16 for the 1966-76 period to -0.06 for the 1977-87 period. We need to improve the tax revenue buoyancies, to, at the very least, balance with the expenditure buoyancies.
### TABLE 2.14.
TAX RATIO AND TAX REVENUE INDICATORS FOR MALAYSIA
(1981 - 1988)
(in percentage)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1981</td>
<td>21.86</td>
<td>18.18</td>
<td>80.3</td>
<td>66.8</td>
<td>47.0</td>
<td>39.1</td>
<td>58.9</td>
<td></td>
</tr>
<tr>
<td>1982</td>
<td>20.12</td>
<td>14.64</td>
<td>75.5</td>
<td>55.0</td>
<td>45.2</td>
<td>32.9</td>
<td>59.9</td>
<td></td>
</tr>
<tr>
<td>1983</td>
<td>21.94</td>
<td>16.95</td>
<td>83.1</td>
<td>64.2</td>
<td>54.9</td>
<td>42.4</td>
<td>67.0</td>
<td></td>
</tr>
<tr>
<td>1984</td>
<td>20.71</td>
<td>15.43</td>
<td>83.2</td>
<td>62.0</td>
<td>59.1</td>
<td>44.0</td>
<td>74.6</td>
<td></td>
</tr>
<tr>
<td>1985</td>
<td>21.54</td>
<td>15.39</td>
<td>83.2</td>
<td>59.5</td>
<td>62.3</td>
<td>44.5</td>
<td>78.7</td>
<td></td>
</tr>
<tr>
<td>1986</td>
<td>20.64</td>
<td>14.81</td>
<td>73.2</td>
<td>52.5</td>
<td>54.3</td>
<td>39.0</td>
<td>72.2</td>
<td></td>
</tr>
<tr>
<td>1987</td>
<td>15.59</td>
<td>12.19</td>
<td>56.4</td>
<td>44.1</td>
<td>43.4</td>
<td>44.1</td>
<td>64.0</td>
<td></td>
</tr>
<tr>
<td>1988</td>
<td>17.44</td>
<td>13.16</td>
<td>64.5</td>
<td>48.6</td>
<td>50.5</td>
<td>38.1</td>
<td>77.1</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** All — all taxes included.
select — all taxes excluding petroleum income tax and export duties on petroleum.

Other government revenue came from petroleum royalties, fees, licences and other income.

iii. ESTIMATE OF TAX REVENUE GAP

A rough estimate of the expected gap between revenue and expenditure in Malaysia for 1989 was quite substantial. The Gross Domestic Product in 1987 was about M$ 75.982 billion. An 11% resource gap means M$ 8.355 billion assuming the government is maintaining a straight balanced budget which is very optimistic. The analysis shows that even under fairly optimistic assumptions, there will still be a need to generate additional revenue from the tax reform exercise.

(b) REDUCING THE COST OF DOING BUSINESS IN MALAYSIA

To be an attractive international investment zone, Malaysia must be competitive in offering incentives and facilities for investors doing business in the country.

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14 In terms of % of GNP,

Government revenue = Non-petroleum + Petroleum + Non-tax revenue
tax tax
= 14.5 + 5.0 + 7.5
= 27.0

Government expenditures = Operating + Development expenditure expenditure
= 28.0 + 10.0
= 38.0

Resource gap = Total revenue - Total expenditure
= 27.0 - 38.0
= 11% of GNP.

15 This arithmetic calculation shown on the previous footnote assumed that tax revenue increased in linear proportion to the gross domestic product.

16 In actual fact, the built-in elasticities of the sales and excise taxes are expected to be lower than one, while the respective elasticity for income tax - personal and corporate, are expected to be higher than one.
It is crucial therefore to make this reduction in the cost of doing business as one of the reform objective. However, it cannot all be tackled through the tax system. There are four major areas in which this objective could be supported.

i) **DIRECT TAXES**

Basic tax rates are normally used as the criterion for competitiveness. The Malaysian Corporate tax rate is considered quite stiff compared to the world standard. It is also one of the highest in the region\(^{17}\). For local investors, the relevant criterion hinges on personal tax rate\(^{18}\). Malaysian personal tax rates are still regarded as one of the highest in ASIA.

ii) **INDIRECT TAXES**

The two main taxes which concern investors are input and output taxes. The former affects sales prices and the later affects input cost\(^{19}\). Malaysian sales tax is levied at manufacturers level, which makes it burdensome to manufacturers. Even after taking into account exemptions and exclusions, indirect taxes are still regarded to be comparatively high.

\(^{17}\) Considering the superimposition of development tax i.e. 40% corporate tax rate + 5% Development tax rate.

\(^{18}\) Since corporation tax is just an intermediary tax in this country.

\(^{19}\) Which together affects the competitiveness of a business.
iii) HIDDEN COST OF DOING BUSINESS

Investors are also concerned with hidden costs when selecting their investment grounds. These include:

* The lack of clear and definite guidelines as to the implications, deductions allowance and other procedures on the part of Inland Revenue Department and other tax implementors.
* Complex compliance requirements in the tax system.
* Lack of speed on the part of Inland Revenue Department in clearing assessment and refunds.
* Myriad requirements for certification of claims and exemption.

iv) INVESTMENT INCENTIVES

Investors normally expect four forms of incentives which would reduce their cost of doing business:

* Import duty exemption on the purchase of plants and machinery from abroad, which would reduce their capital outlay.
* Import duty exemption on the purchase of raw materials from abroad, which would reduce their input costs.
* Export or Sales tax exemption on the sale of production output, which would make their product more competitive in the market.
* Income tax exemption on profit from businesses, which would improve the overall profitability of the business.

Other than these direct monetary incentives, investors also expect fast and efficient services in attending formalities when starting their operation in
Most countries only give emphasis to the fourth type of incentive, which makes incentive packages incomplete and unattractive to potential investors. An attempt should therefore be made to balance this form of incentive to make it truly competitive by observing the incentives package being offered by neighbouring countries. Comparative forms of incentives provided by countries in ASEAN are shown on Table 2.15\(^{20}\).

(c) \textbf{PROMOTING ECONOMIC EFFICIENCY BY MINIMISING DISTORTIONS IN THE RESOURCES ALLOCATION}

Very rarely are taxes neutral with respect to resource allocation. Most taxes affect economic behaviour either in an intended fashion or in a way not foreseen by policy makers\(^{21}\). In devising a tax reform package for Malaysia, one should try to minimise the unintended or undesirable distortions in resource allocation. Some of the distortion elements that need to be minimized include the export tax on rubber\(^{22}\),

\(^{20}\) Note that Indonesia abolished all forms of investment incentives in its 1984 tax reform. Brunei has a tax holiday incentive up to 5 years and tax free interest on foreign banks only.

\(^{21}\) Some distortions were deliberately used in order to achieve specific goals in the economy like promoting saving, investment and growth in certain sectors in the economy.

\(^{22}\) Which impinges on the earnings of a large number of poor households by forcing them to contract output.
import duties\textsuperscript{23}, sales tax\textsuperscript{24} and services tax\textsuperscript{25}.

\textsuperscript{23} Which consists of wide variations in the level of effective protection and large exemptions for specific imports and result in certain industries receiving more protection than originally intended.

\textsuperscript{24} Which is levied only on businesses with an annual sales value exceeding M$ 1,000,000, presumably to spare smaller establishments from the tax, but has the undesired effect of discouraging small manufacturing units from expanding.

\textsuperscript{25} From the same argument.
<table>
<thead>
<tr>
<th>Type of incentives</th>
<th>MALESIA TAX HOLIDAY</th>
<th>PHILIPPINES INCOME TAX EXEMPTION</th>
<th>SINGAPORE INCOME TAX EXEMPTION</th>
<th>THAILAND INCOME TAX EXEMPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment tax allowance</td>
<td>up to 5 years</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Export allowance</td>
<td>5% of export value and value added and prom. exps</td>
<td>based on export value</td>
<td>based on export value</td>
<td>based on export value</td>
</tr>
<tr>
<td>Other form of tax incentives</td>
<td>* Income tax abatement</td>
<td>* Tax exemption on machines imported</td>
<td>* Tax deferred R&amp;D res.</td>
<td>* Tax exempt. on purchase of machines</td>
</tr>
<tr>
<td></td>
<td>* Ind. bldg allowance</td>
<td>* reduced income tax</td>
<td>* Fund mgt. cons rate.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>* tax exemption on imports of machinery</td>
<td>* Tax cred. on value earned</td>
<td>* SIMEX tax holiday.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>* incentive to trader and service exporter</td>
<td>* Write off pat. right</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>* Vent. capital relief</td>
<td></td>
</tr>
</tbody>
</table>

Source: Compiled from Rolt & Talib (1986) Income Taxation in the ASEAN countries - A comprehensive guide and analysis
(d) SIMPLIFICATION AND RATIONALISATION OF THE TAX SYSTEM

Overall simplification of the tax system ensures that tax assessment will be easily understood and computed. Simple and easily comprehensible procedures encourage compliance and minimise inequities. Simplification will also facilitate the introduction of the self-assessment system.

Rationalization will be done by the reappraising of existing taxes to evaluate their usefulness and coherence with the other objectives of tax reform, reviewing the base of the various taxes, their rate structure, administration and compliance procedures. The tax statute must be simplified and ambiguous aspects removed to improve the task of administering these taxes.

Notice, however, that the equity objective has not been explicitly dealt with in the 1988 Tax Reform objective. This was purposely done with several considerations in mind:

a) Growth in the economy is considered to be an essential prerequisite for any meaningful income

26 This will also allow every taxpayer to enjoy the full benefits of legitimate allowances and deductions.
27 Arising from the inability to take full advantage of these permissible allowances.
28 That will release resources in the Inland Revenue Department from the considerable burden of assessment to a more effective task of auditing and enforcement.
redistribution to occur\textsuperscript{29}. There will be little to be distributed without growth and capital accumulation. Therefore growth has to be considered as a priority objective, not equity.

b) In order to stimulate growth, it is necessary to give tax incentives to groups that are most likely to respond quickly and effectively\textsuperscript{30}.

c) There is no unequivocal evidence that the tax system is the best device to achieve the equity objective. It has, however, been pledged that, wherever possible, the tax reform will seek to minimise or mitigate serious violations in the equity objective.

C. AGENDA FOR THE 1988 TAX REFORM

A summary of the tax reform agenda is outlined below. Only the relevant reforms proposal that were later evaluated in the studies are presented\textsuperscript{31}.

a) REFORM IN THE CORPORATE TAXATION

The relatively high tax rate on corporate income imposed in Malaysia compared to that level in neighbouring countries has been the major concern. To be competitive, the TRG recommended a drop in the effective rate to at most 35\%\textsuperscript{32}. This must be accompanied by an

\textsuperscript{29} whether this redistribution is attempted through the tax system or outside it.

\textsuperscript{30} which often implies giving tax breaks to sections of society who are perceived to be quite well-off.

\textsuperscript{31} For details of the reform proposal, refer MIER (1987).

\textsuperscript{32} which means corporate rate should be reduced by 5\% plus the abolishment of the 5\% Development tax on
effort to generate additional tax revenue which could be done through the broadening of the tax base. The estimated cost of the 5% reduction in the corporate tax rate and the abolishment of the 5% development tax to the Treasury is about M$ 550 and M$ 450 million respectively.

It is proposed that the present tax integration system be maintained. It is thought that the classical system will not increase tax revenue very much as in the present imputation system. Only about 10% of the corporate tax was refunded to shareholders in the last 10 years.

(B) REFORM IN THE SALES TAXES

The Malaysian Sales tax is quite unproductive compared to other countries in the region. Low productivity can be explained by a few underlying reasons.

O TAX BASE EROSION CAUSED BY BROAD EXEMPTION

Before 1987, nearly 75% of manufacturing production and imports were exempted from Sales tax. This has slowly been reduced in the 1988 budget. Scope for further reduction in the exemptions is still wide, which could also provide a big potential for future tax revenue.
THE ODD STRUCTURE OF THE SALES TAX

Sales tax is levied at the manufacturer's level\textsuperscript{35}. It therefore yields lower revenue than if it was to be imposed at the wholesale or retail levels\textsuperscript{36}. The problem of transfer pricing has made it worse\textsuperscript{37}.

To improve Sales tax performance, the following measures had been recommended:

* REFORM IN THE TAX BASE

As a short term measure, three recommendations were made:

@ LIMITING TAX EXEMPT ITEMS: A thorough examination of the exemptions should be undertaken with the view of finally exempting only a very limited category of goods\textsuperscript{38}.

@ LIMITING EXEMPT BODIES OR ORGANIZATIONS: It is recommended that the current practise of exempting organizations for the purpose of sales tax be abolished\textsuperscript{39}, except when it is found to be justifiable both socially and economically. Attempts should then be made to re-examine the list of these exempted bodies.

\textsuperscript{35} Which is remote from the final consumers.
\textsuperscript{36} As the element of wholesale and retail mark-up is missing from the system.
\textsuperscript{37} As most manufacturers's output goes to middlemen before it gets to final consumers.
\textsuperscript{38} Such as basic food-stuff, medicines and educational materials.
\textsuperscript{39} Including the public as well as private sector.
© IMPROVING THE RING SYSTEM: The 'ring system' must be improved to avoid the snowballing effect in the system\textsuperscript{40}. At the same time, control must be tightened\textsuperscript{41}. A partial credit system must be introduced to all manufacturers, which would be a forward step toward a full credit system\textsuperscript{42}.

For a medium and long term reform, a few other recommendations must be adopted.

© EXTENDING TAX BASE ON THE SALES TAX: The Treasury should study the possibility of extending the coverage of Sales tax to include wholesalers and subsequently retailers\textsuperscript{43}.

© INTRODUCING FULL CREDIT SYSTEM: As a longer term objective, plans should be made to introduce the full credit system. With all this in force, the sales tax will only need to be re-labeled as Value-Added tax\textsuperscript{44}. Income type of Value-Added tax had been proposed for Malaysia.

© LOWERING EXEMPTION LIMIT ON MANUFACTURERS: Currently a M$ 1,000,000 floor limit is being imposed on annual turnover before a manufacturer will be subjected to the sales tax. As this is thought to be too low and creates a

\textsuperscript{40} when input is passed from one manufacturers to the other.

\textsuperscript{41} for example to avoid intermediate manufacturers in the manufacturing chains from obtaining their inputs free of tax.

\textsuperscript{42} Or a form of Value-Added Tax system.

\textsuperscript{43} This system requires at least a partial credit method to be in operation, which is parallel to the earlier recommendation.

\textsuperscript{44} Which becomes the ultimate target of the system.
wide erosion in the base, it is recommended that the exemption limit be reduced to M$ 500,000.

* REFORM IN THE TAX RATE

It is recommended that only two rates be used in the system to clearly discriminate against luxury items.

@ INCREASING THE BASIC RATE ON THE SALES TAX: The group recommended an increase in the rate from the present 5% to 10% on basic items. To avoid over burdening the low income group, it was suggested that the semi-luxury goods be classified as basic goods\textsuperscript{45}. This will indirectly provide incentives for people to save (or spend on capital goods).

@ FIXING A HIGHER RATE ON LUXURY ITEMS: Certain luxury items\textsuperscript{46} should be categorised together with liquor and cigarettes, which are currently being taxed at 15%. The selection of these goods should be based on the income elasticity of demand.

@ INTRODUCING ZERO RATE FOR BASIC NECESSITIES: It is recommended that a zero rate, instead of exemption, be used for essential goods\textsuperscript{47}.

\textsuperscript{45} These are items such as transistor radios, electric kettle, low engine capacity motorcycles, televisions etc.

\textsuperscript{46} such as jewellery, imported perfume, imported furniture etc.

\textsuperscript{47} Such as food-stuffs, medicines, educational materials and other goods required for the social well being of the lower income sector.
ii) REFORM IN THE SERVICE TAX

Unlike the Sales tax, service tax is levied on the consumer at the retail level. It could therefore act as a complement in the policy instrument of the government. A few measures were suggested here.

@ REDUCING THE THRESHOLD FOR LICENSING TO RAISE THE BASE
It was recommended that the current threshold on retail outlet turnover of M$ 450,000 be reduced to M$ 250,000 to broaden the tax base and alleviate discrimination.

@ BROADENING THE SCOPE OF TAX : It is also recommended that the scope of services covered be broadened to include other services such as telephones, telex, electricity, water, repairs, brokerages and recreation activities.

* RETAINING THE TAX RATE

It is recommended that the tax rate be retained at the present 5% until the full Value-Added Tax is introduced.

iii ) REFORM IN THE EXCISE DUTIES

With the reform in the Sales tax, the role of Excise Duties should then be altered to achieving the equity objective by varying its rate on different commodity groups.

48 On the part of the consumer as a result of the different size of retail and distribution utilised by them.
RAISING THE RATE ON GASOLINE: Gasoline tax could be a very productive instrument as gasoline is price inelastic in the short run. It should be used to absorb any price reduction in the petroleum price in the world market. Malaysians still enjoy a relatively low gasoline price\(^{49}\). The tax rate increase could compensate the revenue loss from the reduction in the corporate tax rate.

(iv) REFORM IN THE EXPORT TAXES

Export tax has been used as a means to regulate and stabilize the production of export commodities aside from its role in generating revenue for the government. Rubber export tax is probably the most regressive tax as far as the poor are concerned. The tax collection was estimated to be about 7% of the smallholders net income. Its effect is regressive because those cultivating higher yielding trees (mostly plantation companies) are paying the same proportion of their income in taxes as those with a lower income (which contradicts the vertical equity principle). The tax falls more heavily on the smallholders who had been established as inefficient producers. It also discriminates against rubber smallholders to other small peasant farmers or urban workers who earn similar amount of income relatively.

ABOLISHING EXPORT TAXES ON CERTAIN COMMODITIES The group recommended abolition of export taxes on traditional commodities. It could be replaced by a land

\(^{49}\) Compared to neighbouring countries i.e. about M$ 1.00 per litre for premium and M$ 0.90 for regular.
tax if necessary. The anticipated revenue loss will be relatively small. Its abolition will benefit 400,000 smallholders in the rubber plantation industry. (It should be borne in mind, however, that the possible impact would be a drop in the world market price).

(v) REFORM IN THE IMPORT TAXES

Import taxes provide a source of convenient tax revenue, act as a measure of protection for the specific targeted industries in Malaysia, act as an unofficial control on foreign exchange purchases and help to mobilise local resources by restricting non-essential imports. Import taxes used to be a major revenue earner in the 1970’s. However, a broad exemption provided to government bodies and other entities has eroded the tax base. It is recommended that the base be broadened on other goods, while exemption be provided on the import of capital goods.

2.6. FINAL REMARKS

Even though the list of reforms proposals is elaborate, most of the proposals were related to administrative measures which attempt to deal with the actual implementation of the reform. The main structural reform that should be evaluated seriously using the General Equilibrium model are listed as follows:

* The effective reduction of Corporate and Development tax by a total of 10%.
* Short term measures related to Indirect Taxes:
  .The increase in the Sales tax rate by 5% (from 5%);
  .The increase in the tax base on Services tax;
.The increase in the tax rate on Excise duty on petroleum;
. The abolition of the Export tax on traditional commodities to relieve smallholders;
* The long term conversion of the Sales and Services taxes into a Value-Added Tax system.

The rest of the reforms proposal had to be evaluated qualitatively and was addressed exhaustively during the workshops sessions held between the Tax Reform group with the Officers of the Inland Revenue Department, The Royal Customs and Excises Department and the Treasury Department.
CHAPTER 3

DESCRIPTION OF THE GENERAL EQUILIBRIUM MODEL USED IN THE TAX REFORM EVALUATION EXERCISE

3.1. INTRODUCTION

This chapter discusses the basic general equilibrium model as a foundation of the research methodology. This is deemed important since general equilibrium has been utilised as the most crucial research instrument in this study. It then proceeds to describe the specific elements and forms of the general equilibrium model employed in the tax reform appraisal works.

General equilibrium analysis is an attempt to deal with the inter-relationships between sectors based on macroeconomic theories. It is a system of simultaneous equations describing the demands and supplies of each commodity in an economy\(^1\). The model thus illustrated the overall interrelation of all markets.

A. BASIC DESCRIPTION OF THE GENERAL EQUILIBRIUM USED IN THE MODEL

We introduce the basic model to be used in the general equilibrium analysis in order to set out the framework for a critical analysis later in the chapter. It is hoped that this illustration will provide an insight to the model for the reader who is not interested

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\(^1\) With prices of all commodities occurring in each equation, so that a change in any one of the demand or supply equations would cause changes in all prices and quantities.
in the more extensive and technical discussion that follows later.

The taxonomy of the transactors or agents in the model can be described simply by focusing on two main sectors in the economy, namely, the household and the firm sectors. The household sector consists of three main sub-sectors namely the private households (which have been sub-divided into six categories according to income and expenditure pattern), the ‘public households’ (which represent the expenditure side of the government) and the foreign sector which represent the rest of the world.

The firms sector represents all industries in Malaysia which includes all economic activities in the economy from agriculture to services. Industries have been regrouped into ten main groups according to the nature of their activities.

All households including the private, ‘public’ and foreign households maximise a regular, neoclassical utility function subject to a budget constraint. Utility depends on the demand for goods and the supply of factors. In the case of private households, the budget constraint is determined by after-tax prices, Lump-Sum transfers, the household’s net income after tax and taxes. Foreign households’ budget constraint is the balance of payments. The Public sector budget is determined by the transfer to the sector from the Treasury. They demand goods and factors to satisfy public wants. The utility function of the public household sector endogenously determines public consumption, which could be derived from the preferences for public goods of private households.
The Private sector is classified into six categories, all of which sell endowments of capital and labour services to the market, particularly to the firms sector, though to the public sector as well. The Foreign sector also sells capital endowment besides goods and services in the form of imports to the economy. The domestic final demand for each tradable good is a composite of imported final goods and domestically produced final goods called Armington goods.

All the households sectors demand final goods in the market for consumption and investment. For the purposes of our model, investment by the households sector (which equals saving) is represented by their purchase of investment goods. In the case of the foreign sector, the demand for goods and services is reflected by the export volume of Malaysia. A "small economy" assumption is made in specifying the foreign sector, making Malaysia a price taker in both the supply and demand for goods and services.

Firms consist of ten industries which have been reclassified from the Input-Output Table listing. Goods that do not fit into any classification have been lumped into "other goods" and treated as a sector in the economy. Firms are assumed to be facing a perfectly competitive market; taking prices as given; and making normal profits. Firms are also assumed to maximise profits subject to a production function, which allows for substitution between inputs. Inputs comprise imports, intermediate deliveries from other domestic producers, labour and capital services. Labour is further dissaggregated into six categories which match the private households classification. Capital is sector specific and immobile during the period of reference.
Taxes are introduced into the model as the tax wedge i.e., the difference between the before-tax price and the after-tax price. All taxes are in the form of ad valorem taxes imposed on the firms sectors in the case of indirect taxes and on the private households sector in the case of direct taxes. The Foreign sector pays export taxes as well as a tax on capital income. The Public sector only pays payroll tax on labour services consumption. Private households pay income taxes (which include employees EPF contribution) and capital taxes. The firms sector pays Manufacturing taxes on products including Sales and Excises, Payroll tax on wages paid to labours groups and also import tax on imported goods. In the Capital taxes sensitivity analysis, the firms sector also pays Capital taxes.

The model description above can be illustrated in a diagram as follow. In diagram 1 below, we have divided the economy into three major parts, namely, the households sector at the top which supplies labour and capital endowments as also imported goods, and demands final goods as well as some services from the input market. At the bottom is the firms sector which produces goods and services and supplies them to the market. They demand intermediate goods from among themselves, some capital and labour services from the input market and also some imported goods from the foreign sector.

Both major sectors demand and supply goods and services in the final goods market as well as in the input or intermediate goods market. Demand always equals supply in all the individual markets as well as the aggregate market.
The Government Treasury comes in between these two major sector and intervenes in the market which is the clearing place in the economy. It imposes ad valorem taxes on transactions between agents in the economy (or transactors). Taxes thus form a wedge between the producer price and the market price.

Tax collections will then be channelled directly to the public households sector which in turn will spend it on public expenditures. Private households' income equal private consumption expenditure (including saving). Foreign income in the form of import values of goods and services will be offset by foreign sector expenditure in the form of export. The difference will determine the balance of payments. Firms' income will equal their total costs leaving them earning only normal or zero profit.
FIGURE 1 : STRUCTURE OF THE GENERAL EQUILIBRIUM MODEL OF THE MALAYSIAN ECONOMY AND TAX SYSTEM

AGENTS

PUBLIC SECTOR
- represent the expenditure side of government
  assumption: Public consmp is endogenous to the model. Ind. pref of publ. g seperable frm prv

PRIVATE HSLDS
- 6 categories base on income
  assumptions: Hlds maximise regular neo-classical utility function subject to a budget constraint

FOREIGN HSLD
- represent the rest of the world
  assumption: Budget constraint is the balance of payment

DEMAND OR SUPPLY

CONSM. GOODS
- demand by: Public sect, Prvt. hlds, Foreign hsl - export

LABOUR SERV
- supplied by Prvt. hlds, demand by: Public sect

CAPITAL SER
- by: Prvt and Foreign hsl, demand by: Firms sect

IMPORTS
- demand by: Foreign sect, supply to: Firms sect

FINAL GOODS
- Firms SS equals Public, Prvt and Foreign sect. DD

MARKET

INPUT MARKET

LABOUR
- CAPITAL
- INTERM.GD.

Hld SS equals Hld SS equals Firms SS equals Firms SS equals Firms DD Hld DD

DEMAND OR SUPPLY

TAXES PAID
- From: *final gd transact *input gd transact

FINAL GOODS
- supplied by the firms sectors into final goods mkt

INPUTS GOOD
- by the firms sectors into input goods mkt

INTERMD.GOOD
- by the firms sector into input goods mkt

AGENTS

GOVERNMENT TREASURY
- Tax collection side of government
  Assumption: Collect Advaloram taxes in the form of tax wedge.

FIRMS SECTOR
- 10 industrial sector
  assumption: Firms faced perfect compet and maximise profit. Faced classical prod function and CES.

Source : the General Equilibrium relationships of the model

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B. DEVELOPMENT OF GENERAL EQUILIBRIUM ANALYSIS

The concept of General equilibrium analysis was developed by Leon Walras (1874)\(^2\). His effort in transforming economics from a micro perspective into a macro-version emphasising the interaction of the innumerable forces, gained him the title of 'the Laplace of economics'\(^3\). Samuelson had, however, added that credit was also due to others\(^4\) for their significant contributions in the development of General Equilibrium analysis theory\(^5\).

Operationalizing Walras has nonetheless been the preoccupation of economists for the last six decades. It began with Barone in the 1930's, to Leontief\(^6\) in the 1960's with the linear and non-linear programming planning models in the 1950's and 1960's. Before 1962, most incidence analysis consisted of a partial equilibrium. An applied general equilibrium model for policy evaluation was pioneered by Harberger (1962),

\(^2\) A nineteenth century French economist in his book 'Elements d’Economie politique'.

\(^3\) Boulding (1955), described Walras as "Laplace of economics" (after the well known astronomer) for his effort in transforming economics from a system in which each value was attached to its own particular cause, to a system in which all values whether of finished goods, intermediate products, or factors of production are mutually determined by the interaction of the innumerable forces of preference upon the innumerable resistances of scarcity.

\(^4\) Like W.S. Jevons of UCL, C. Menger of Austria, A. Marshall of England, J. B. Clark of USA, V. Pareto of Italy, K. Wicksell of Sweden and to a certain extent Adam Smith.

\(^5\) Samuelson (1964) said that all the above authors had made significant contributions at least in terms of the concept.

\(^6\) With his input-output analysis.
developed further by Mieszkowski (1969), Shoven and Whalley (1972) and McLure (1975). On a larger scale, modelling efforts were advanced such as by Piggot and Whalley (1976, 1985) on the U.K, and Ballard, Fullerton, Shoven and Whalley (1985) on the U.S.A. economy.

The Walrasian model had also been applied for other specific modelling efforts, such as by Summers (1981) and Auerbach, Kotlikoff Skinner (1983).

C. WALRASIAN AND KEYNESIAN TUSSLE

Even though scholars like Schumpeter believed that the Walrasian system of General equilibrium is the 'Magna Carta' of economics, he considered that the attempt to operationalise Walras' a 'utopian pipedream'. The reason for this overstatement was the preoccupation of Keynesian ideas in economic theory. Keynesian theory stresses that disequilibrium (at least in the labour market) prevails due to constraints on adjustments associated with inelastic money prices. Walras law, on the other hand, emphasises the concept of equilibrium. The success

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7 In the sense of providing a usable tool for policy makers and planners to evaluate the implications of different courses of action.

8 And also due to the rudimentary computational technology available at the time.

9 Which was normally related to the concept of Underemployment equilibrium (or rather 'Underemployment disequilibrium' as Lipsey (1979) put it). It states that to reduce unemployment, we must expand aggregate demand—either consumption or investment. This could be achieved simply by increasing public expenditure and reducing taxes to stimulate private consumption (Keynes, 1936).

10 Whereby, the value of excess demands at given prices always equals the value of excess supplies; equilibrium in all but one market must imply equilibrium on the remaining market and disequilibrium in any one market must imply disequilibrium in at least one other market.
of modern Keynesian remedies during the depression of the 1930's, occupied the attention of most economists working on this theory.

The post-war Keynesian models insisted that there will always be some constraint adjustment due to rigid prices. Basically, Keynesian economist assumes that the economy is always in disequilibrium in terms of employment and public consumption. These views are in total contrast with the concept of General equilibrium, which assumes that prices are flexible enough to clear all markets instantaneously, while money is disregarded and only relative prices assumed to matter. At present, when unemployment and inflation prevail, it might seem unrealistic to view the world through the eyes of Walras. This was based on the premise that the model could not describe disequilibrium phenomenon like unemployment and deficit budget. The Keynesian model, on the other hand, refers to an assumption of constrained adjustments due to rigid prices. Here disequilibrium prevails due to constraints on adjustments.

market (Gravelle and Rees, 1986).

11 After First World War.

12 The cause of price rigidity is somewhat obscure but sometimes thought to be institutional factors affecting the economic system without being part of it themselves and because money is normally introduced in the Keynesian model as numeraire. Price rigidity here might be interpreted as rigidity in money prices.

13 Deficit or surplus budget.

14 As viewed through the eyes of Walrasian.

15 This could however be rejected as it was shown by Kehoe and Serra-Puche (1983) for example that the effect of tax reform on employment and deficit budget could be analysed using a Walrasian base model which assumed a fixed wages rates.

16 Associated with sticky money prices.
To analyse stabilisation policies, such as the effects of different public policies on employment and output, the Keynesian model would be more useful. However, to analyse the allocational and distributional effects of tax changes, the Keynesian model is less appropriate, as it is difficult to trace changes. Ideally therefore, we ought to integrate both approaches in order to make the model complete and realistic. Indeed, attempts in this direction were made by economists in the past. Asimakopulos and Burbridge (1974) for example, developed a general equilibrium model using a pure Keynesian concept to evaluate tax incidence. A mixed Keynesian-Walrasian model of tax incidence could also be found, for example, in Henderson and Sargent (1973) and Dixit (1976).

Both Keynesian and Walrasian models might be justified by making reference to a particular span of time. In the Keynesian model, emphasis is on temporary or short run phenomena, while the Walrasian model refers to medium or long run movements depending on the assumptions made about the accumulation of stocks. Market clearing is therefore regarded as fundamental in the end. The Walrasian effect could therefore show only the dynamics behind an infinite succession of disequilibrium states.

The choice between models is therefore a matter of objectives and purpose of the analysis. If one is

17 As the model pays little attention to the simultaneous determination of relative prices.

18 Every state where demand does not equal supply must be temporary, since in the long run, prices would shift in such a way that equality between supply and demand would eventually be achieved.
concerned with stabilization policies, a possible choice seems to be the Keynesian model to analyse the effect of different public policies on employment and output. If, on the other hand, the objective is to study the allocational and distributional effect of tax changes as in our case, the best vehicle seems to be the Walrasian model.

Even then, in an exact sense, operationalizing any of the above model would be impossible. The detail and complexity involved in actually making policy decisions rapidly, overwhelms the capacity for capturing all the details. The choice of a particular equilibrium model to use, such as static or dynamic, open to foreign trade or closed, with or without market imperfections, again result in large variation in the results. In the end, subjective judgement on the part of the modeller is what matters.

D. BASIC NATURE OF GENERAL EQUILIBRIUM MODEL

In a traditional general equilibrium model the following equations are derived:

* a number of consumers are identified, each with an initial endowment of commodities and a set of preferences. This subsequently determines market demand when aggregated. Demand here includes demand for current, as well as future, consumption (saving).

\[19\] which yield household demand functions for each commodity.

\[20\] which will be tackled differently depending on the static or dynamic nature of the model. A further discussion on this follows.
* Commodity market demands depend on all prices and are continuous, non-negative, homogenous of degree zero. This demand is made to satisfy Walras' Law\textsuperscript{21}.

* On the production side, technology is described by either constant returns to scale activities or non-increasing returns to scale production functions with producers maximising profits.

* Taxes are normally introduced in \textit{ad valorem} form, either as producer taxes on inputs or consumer taxes on incomes or expenditures\textsuperscript{22}.

* Tax Revenues are normally modelled or assumed to either be redistributed to consumers or used to finance publicly provided goods and services.

In these models, only relative prices are of any significance as demand functions are homogenous of degree zero\textsuperscript{23}. Under constant returns to scale, no activity does any better than break even at equilibrium prices. Equilibrium is therefore achieved when prices and quantities meet the equilibrium conditions\textsuperscript{24}. At this equilibrium, total demand for each output equals production, and producer revenues equal costs. Labour and

\textsuperscript{21} which equates consumers expenditure with consumers incomes.

\textsuperscript{22} Modern tax systems (personal, corporate, sales, excise and other taxes), are usually represented in model equivalent form to investigate the equilibrium behaviour of the model as tax change.

\textsuperscript{23} Equilibrium is characterised by a set of relative prices and levels of production by each industry such that market demand equals supply for all commodities.

\textsuperscript{24} that market demand equal market supply for all inputs and outputs at zero profits in each industry.
capital endowments are fully employed and consumers' factor incomes plus transfers equal consumer expenditures.

Per unit costs in each industry always equal the selling price because of the constant returns to scale and zero profit assumptions. The general analysis is to find the differential in the welfare costs\(^{25}\) of a situation under no tax equilibrium with a tax equilibrium\(^{26}\) or to compare two different tax equilibria.

To make the model more realistic and comprehensive, we normally need to widen the dimension, alter the parameter specification and introduce more complex policy regimes. Other issues that need to be resolved in building a general equilibrium model include the selection of either a traditional fixed-factor static form or dynamic model, decision on the incorporation of substitution in production and demand, parameter values and their estimation, on deciding how trade, investment, government expenditures or other features are to be treated, how the model is to be solved i.e. using a fixed point solution method or linearization, and how the computed equilibria is to be compared.

E. GENERAL EQUILIBRIUM IN PRACTICE

General equilibrium analysis has been used in the past by several noted scholars to perform several analysis relating to taxation.

\(^{25}\) measured by the excess burden created which could be determined either by using equivalent or compensation variations as described earlier.

\(^{26}\) See for example Whalley (1985) for further illustration of this sort of model.
* Analysis of the distortionary effects of the corporation tax, for example, was pioneered by Harberger (1962) and later extended by Shoven and Whalley (1972), Mc Lure (1975), Turnovsky (1982) and Klundert and Peters (1986). Further analysis taking into account long run and specific factors was attempted such as the model that took into account uncertainty by Batra (1975), Ratti and Shome (1977), Bhatia (1986) and Bovenberg (1988).


* Analysis of intertemporal models was carried out by Canto (1981), Ordover and Phelps (1979) and Chamley (1985). A related life cycle model has also been attempted by scholars like Kotlikoff and Summers (1979) and Driffl and Rosen (1983) and Seidman (1984). Chamley (1985) had also endeavored to use the dynamic model to analyse tax efficiency.

* Analysis of the effect of tax policies on investment was attempted by Abel (1982), Bruce (1977), Christensen (1969), Harris, Heady and Mitra (1987) and Kihlstrom and Laffont (1983) on risk taking. Heady and Mitra (1986) also did an analysis to compute the optimal tax policies.
Other related analyses include those on the inflation effect by Ebrill and Possen (1982), on the debt equity ratio impact by Auerbach and King (1983), on international trade by Shoven and Whalley (1984), on discriminatory features of domestic factor tax system by Whalley (1980), on the determination of the level of public expenditures by Egozi (1973), on the size of public sector by Gortz and Hanson (1976), on tax compliance by Reinganum and Wilde (1986) and on Value-Added Tax incidence by Yeh (1979).

3.2. DESCRIPTION OF THE SPECIFIC MODEL USED

The model used in this research basically approach taxes as levies on transactions between units in the economy, namely consumers and suppliers. It is based on Dalton's law (1936)\(^{27}\) which was originally a partial equilibrium in nature.

The model basically attempts to simulate the Malaysian economy by first observing the relationship between agents in the economy namely consumers, producers and the public sector. Consumers are described as the suppliers of services\(^{28}\). In return, they obtain income which they then spend on consumption and saving (investment). Producers produce products\(^{29}\). They utilise intermediate products as factor inputs as well as value

\(^{27}\) Which was very popular until 1962, and states that:

"the burden of a transaction tax will be shared according to the price elasticities of demand and supply, with the buyers share the larger, the less elastic is demand and the more elastic is supply".

\(^{28}\) Namely labour and capital services.

\(^{29}\) Either for final or intermediate consumption.
The public sector basically collects taxes from the household sector\textsuperscript{31} and firms sector\textsuperscript{32}. All tax collection goes to the public sector, which spends on goods and services.

A. BASIC ASSUMPTIONS MADE IN THE MODEL

Several assumptions need to be specified before a further discussion on the model is possible.

i. Perfect competition in the private sector markets exist, which make private goods rival\textsuperscript{33}.

ii. Taxes are classified into two major categories, namely:

* Transaction taxes - which are being imposed on purchases and sales of private goods ($T_{TR}$).
* Lump-sum tax - which is defined as compulsory payments from private households ($T_{LS}$).
* A transfer is a negative lump-sum tax ($F$).
* A subsidy is a negative transaction tax ($S$).

It follows from the definition, that

\[
\text{Tax Revenue} = T_{TR} - S \\
\text{Total transfer} = F - T_{LS}
\]

Revenue from lump sum taxes is not included in the total tax revenue, but as a negative transfer.

\textsuperscript{30} In the form of labour and capital services.
\textsuperscript{31} In the form of income taxes on households income from the rendering of labour services and corporate tax on the income from the rendering of capital services (in the form of dividends, interest and rent).
\textsuperscript{32} From consumption taxes on products sold by them.
\textsuperscript{33} Public goods, however, are assumed as non rival to private goods in consumption.
iii. Each household maximises a regular neo-classical utility function subject to a budget constraint. Utility will depend upon net demands for goods. A budget constraint is determined by the relevant net prices and transfers. Household includes private household sector, public household and foreign household. Public consumption is endogenous to the model. Individual preferences for public goods are assumed to be separable from private goods, while marginal rates of substitution between public goods are identical for all private households.

iv. All firms maximise profits. They operate according to the classical production function. Input comprises of primary factors as well as produced goods. Under perfect competition, firms make normal profit (zero profit). Firms operate under constant returns to scale. Subsidy to firms is excluded.

v. The economic system is assumed to be in equilibrium, before and after the tax reform. Equilibrium is defined as an allocation of goods, a set of net prices and a transfer distribution such that:

* Utility of each household is maximised.
* Profit of each firm is maximised.
* Total tax revenue equal total transfer expenditure, and

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34 Including the supply of factor services.
35 Which may allow for substitution and joint production.
36 Intermediary products.
37 Given their budget.
38 Given their prices and technology.
* Aggregate demand equals aggregate supply\textsuperscript{39}.

vi. The model only describes the marginal effects of tax reform, using a linear approximation of all relationships.

vii. Aggregate stock of capital goods is assumed to be constant\textsuperscript{40}.

viii. Compensating variation is used to measure the tax burden\textsuperscript{41}. Positive compensation corresponds to welfare gains. Aggregate burden will be used to measure the efficiency effect of the tax reform proposals. Individual burden equals the income effect of changes in prices and transfers. Burden comprises of direct burden\textsuperscript{42}, plus indirect burden\textsuperscript{43}.

ix. The model does not explicitly take into account inflation\textsuperscript{44}, unemployment\textsuperscript{45}, uncertainty\textsuperscript{46} and growth\textsuperscript{47}.

\textsuperscript{39} Of course, there must also be equilibrium in each of the individual components market, which means supply must equal demand for each goods and services traded in the market.

\textsuperscript{40} Independent of the flow of savings.

\textsuperscript{41} Defined as the lump sum needed in the new situation in order to restore welfare to its former level.

\textsuperscript{42} Changes in private goods consumed by the household.

\textsuperscript{43} Reflects the change in consumption of public goods.

\textsuperscript{44} By introducing money as one of the goods.

\textsuperscript{45} As its existence is assumed to be voluntary.

\textsuperscript{46} Because of the static nature of the model.

\textsuperscript{47} Because it is not relevant to our static nature of the analysis.
B. MODEL STRUCTURE

I. DIMENSION

There are 8 classes of consumers including the foreign and government sectors, 10 industries in the economy and 18 goods or expenditure categories\(^48\). Units in the economy are divided into three main sectors namely households, firms and the Government treasury. 

(a) HOUSEHOLDS SECTOR

Households are defined as comprising several classes of income earners\(^49\), the public sector and the foreign sector. Households demand goods and services provided by the firms in the economy. Households also supply goods and services\(^50\). Imports are regarded as supply of and exports as demand by the foreign sector. Households earn income from the supply of labor and capital services\(^51\) and spend them on goods and services\(^52\). The assumption here is that all import and export from/to various countries in the world can be aggregated as a single entity\(^53\).

\(^{48}\) Including labours and capital services.

\(^{49}\) Classified according to their level of income.

\(^{50}\) In the form of labour and capital services.

\(^{51}\) to the firms and public sector.

\(^{52}\) Provided by the firms in the economy.

\(^{53}\) This assumption relies heavily on the fact that Malaysia does not export or import goods and services in large quantities to influence prices in the international market.
(b) FIRMS SECTOR

Firms are defined as a collection of business entities classified according to major sectors in the economy. Firms supply goods and services to households including the public and foreign sectors. Firms also purchase intermediate goods; some import and some labour and capital services.

(c) GOVERNMENT, TREASURY AND PUBLIC SECTOR

The Treasury collects taxes from both households (including public sector) and firms on the transactions they conducted in the economy. The tax instruments available in the economy are as follows:

i. A tax on the sale of labours services is imposed on households. This is equivalent to Personal Income tax under the current system in Malaysia.

ii. A tax on the purchase of capital services is actually a pure Corporate tax under our term. A tax on the sale of capital services would amount to Imputation tax imposed on dividend earned by each shareholder. Taxes

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54 The sectors are chosen to match the consumption patterns of households.
55 From among themselves.
56 From the foreign sector.
57 From the household sector.
58 Based on their income obtained from the firms, foreign sector and the public sectors.
59 This can be discriminated by income level by varying the effective tax rate (average tax rate) according to the income classes.
60 Paid by the firms sector.
61 Taxed on the households sector.
on both the firms as well as the households sector capital services\(^{62}\) would amount to the classical system of taxation.

iii. A tax on consumption actually conforms to the concept of Consumption tax under the Malaysian system. A tax imposed on the firms based on their sales value fits the definition of Sales tax on the manufacturers\(^{63}\). A change in the system of consumption tax based on household consumption at the retail level would fit the definition of the envisaged Value-Added Tax. The tax rate could be discriminated between the type of goods\(^{64}\) by varying the rates according to the industry classification.

iv. Excise tax is a special tax on certain sales of petroleum and other products of firms. For this purpose, goods and services will have to be reclassified according to the Excise duty classification\(^{65}\).

v. A tax on the foreign sector's sales\(^{66}\) fits the definition of Import tax under the current system in Malaysia.

vi. A tax on the foreign sectors' purchases\(^{67}\) fits the definition of Export taxes under the current system.

\(^{62}\) On both the firms capital costs and capital income.  
\(^{63}\) As currently practised in Malaysia.  
\(^{64}\) Produced or consumed by firms/households.  
\(^{65}\) Some goods that had been taxed under the excise tax heading were lumped into part of Sales tax, leaving petroleum as the sole product targeted by the tax.  
\(^{66}\) Or goods imported into the country.  
\(^{67}\) Of goods or export from the country.
vii. A tax on the purchases of labor services sector is equivalent to *Payroll tax*.

It is important to mention here that for the purposes of our model, all payments to the government by the household and firms sectors are considered part of the total tax. This includes contributions to *Employee Provident Fund (Payroll tax) and social insurance*. Similarly, all receipts of households from the government will be treated as negative taxes. This includes pensions, refund of the Employees provident funds and all subsidies.

viii. A tax on private households in proportion to their initial net income$^{68}$ fits the definition of *Lump-sum tax*.

In the case of transaction taxes, all collections will be channelled to the public sector who will then spend on goods and services, in the form of transfer. Lump sum tax collection will not be channelled to the Treasury but instead assumed to be returned back to the public household in the form of lump-sum payment.

C. THE CRUCIAL ELEMENTS IN THE MODEL

The strength of the model depends on the relationship between demand and supply which form the market equilibrium. Crucial to this relationship is the behaviour of households and firms in the economy$^{69}$.

$^{68}$ Income figures used in the benchmark data set.

$^{69}$ In relation to their demand and supply of goods and services from and into the economy.
The concept of elasticity is critical in defining household and firms behaviour in the market. This elasticity concept is however only relevant in a marginal analysis, the model is therefore constrained by this factor. The model could only analyse the effect and impact of marginal changes in the tax instruments in the economy.

D. OBJECTIVES OF THE MODEL

The model attempts to evaluate the impact of the 1988 Malaysian Tax Reform in terms of three basic criteria, namely, the efficiency implication\textsuperscript{70}, the distribution of tax burden (equity)\textsuperscript{71} and tax revenue generation\textsuperscript{72}.

For a detailed description of the model used, see Keller (1980). A brief quantitative description of the model is included in appendix D of the thesis.

3.3. OPERATIONAL ISSUES ABOUT THE MODEL

The static nature of the model, the marginal nature of the analysis and the oversimplification made on some of the relationships in the economy could easily expose the model to criticism. The following discussion evaluates each of these weaknesses and defends them, with an aim to refute some of the prejudice that might have occurred in the mind of the reader.

\textsuperscript{70} Measured by the resulting changes in the excess burden or aggregate welfare change.
\textsuperscript{71} Measured by the changes in the real income of all the different classes of households.
\textsuperscript{72} Measured by the changes in the tax revenue generated from the tax instrument changes.
A. THE STATIC NATURE OF THE MODEL

The model is about competitive statics in nature. Thus, the effect of changes in taxes are examined within a static framework by comparing two equilibrium states before and after the tax change. It is therefore assumed that for each specific set of tax instruments, there is only one equilibrium which holds over time. The changes in taxes will induce an instantaneous change of prices and quantities in order to preserve equilibrium. In the real world, this adjustment towards a new equilibrium will be incremental, owing to changes in stocks over time. This result here is not expected to hold for a short period where imperfect adjustments prevail. The result could not also be expected to hold indefinitely as accumulation of stocks which would occur in the long run would change the equilibrium point. The model might therefore be best described as medium-run and static rather than dynamic. The reference period for the result to become valid is more between one to two years.73

Employing a dynamic model would not make the analysis distinctly better. This is because under a dynamic situation, the adjustment arrives at a new equilibrium after the tax change is normally long (up to 50 years). This naturally complicates the analysis.

Furthermore, in order to see the dynamic effect of the static model used, the model could be simulated by running it successively, starting with each result and adjusting the stocks level resulting from the preceding flow equilibrium to arrive at the same result with that of the dynamic model.

73 As estimated by Keller (1980).
The strategy in our analysis was to avoid the difficult problem of dynamic general equilibrium and confining effort to tying macro-phenomena into a general equilibrium framework.

B. SAVINGS AND INVESTMENTS

Related to the issue of a static model is the problem of accounting for savings and investments. In order to make the model realistic, we need to take into account future consumption resulting from saving and investment. This will need a creation of stocks either in the form of money or durables, which will in turn, need an intertemporal reallocation of household purchasing power.

In our model, we had accommodated saving as the purchase of capital goods or durables and investment goods. The act of saving coincides with the act of investment; since each dollar saved is spent on capital goods. Households are therefore simultaneously savers and investors, and firms only rent out the services of capital goods bought by households. A crucial assumption here is that there is no barrier to the use and disposal of capital goods. Depreciation is also assumed to have

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74 As capital goods is defined as goods of which the flow of services it renders continues after the lapse of one period.

75 Even though in reality it is firms and not households that invest in capital goods, they in fact do that as a delegated task. What actually happens is that firms will guarantee competitive interest rates on loans and the highest yield on investment. All this investment in capital goods is therefore actually owned by the household, while its services are used directly by the firms which acquired them.

76 Or capital goods are assumed to be perfectly malleable.
been taken into account for the approximation of the rate of capital services paid by the firms sector.

C. MOBILITY OF FACTORS

In our model, we make an implicit assumption of perfect mobility between factors. The mobility level will depend on the elasticity of substitution between outputs of the sectors. This assumption of perfect mobility of labour and capital goods means that one unit of labour or capital could be shifted instantaneously between sectors, without cost, to achieve equilibrium. If necessary, we could also create a situation of imperfectly mobile factors. In our case, however we felt that the perfect immobility criterion for the factor market is not that crucial.

D. MARGINAL NATURE OF THE ANALYSIS

The model assumed that all relations are linear. This is a direct consequence of the use of differentials. Furthermore, we also measured relative instead of absolute changes. Thus, the results obtained from this model are only exactly valid for finite changes if all relations are linear in the logarithm of the

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77 Where elasticity of substitution between both outputs in the dual-product firm approaches minus infinity, labour is said to be perfectly mobile between both departments of the firm. Where elasticity of substitution between both outputs in the dual product firm is finite, labour is said to be imperfectly mobile.

78 This could be achieved by creating a labour distributing firm and two firms - one to aggregate various capital and the other to distribute capital (like two departments of a bank).

79 And therefore used elasticities rather than propensities as the basic parameters.
relevant variables. The model would therefore produce results which hold for approximately small (but finite) changes, with the approximation holding better the less non-linear the global system is around the initial situation.

There are some indications that the static general equilibrium model such as the one used here is only moderately non-linear as shown by Whalley (1977) and de Melo (1978). Keller (1980), had concluded that for a small changes in taxes, say less than 10 percentage points of change in tax rate, it does not pay to take into account non-linearities, especially if parameters determining the result\textsuperscript{80} cannot be assessed accurately.

A linear model like the one used here could also account for nonlinearities by adopting a procedure of iterative linearization, as shown by Bovenberg and Keller (1984). Their research findings revealed that the margin of errors in linear results compared to the nonlinear results were small, making it less worthwhile to attempt a nonlinear model operation.

E. THE FOREIGN SECTOR

The economy must be related to the rest of the world, which requires the model to be one with an open economy facing international trade. For the model to be realistic, we should have a sector called international trade.

This was accommodated in the model indirectly by creating a household called foreign sector, aggregating

\textsuperscript{80} Such as the elasticities of substitution in our case.
all the foreign sector's trade by making an assumption of a small-open-economy. The various assumptions made here are

* Domestic and foreign goods are considered to be imperfect substitutes.
* Import and exports are made to correspond to supply and demand of foreign households.
* Changes in foreign prices will be interpreted in terms of changes in exchange rates (since world prices are fixed relative to each other).
* We assumed a balanced budget for foreign household, implying that the balance of payments is in equilibrium.
* The exchange rate is assumed to be floating.

F. TAX FUNCTIONS IN THE MODEL

In the model described above, each tax is modeled as a proportion of prices in the form of *ad valorem* taxes. This not only simplifies the formulation, but also allows the tax rate to be zero in the simulation. In the case of income taxes, this model does not provide a satisfactory relationship. We therefore need to construct a progressive taxation\(^1\) in the model. The progressive nature of income taxes could be built into the model by having a proportional *ad valorem* tax at a rate equal to the marginal tax rate for each group of taxpayers or tax bracket. We have to assume a constant marginal rate locally, reflecting piece-wise linear functions with wide brackets of constant marginal tax rates.

\(^1\) Defined as a situation when the average tax rate on good \(n\), is an increasing function of the corresponding gross income.
In conclusion, progressive taxes can be fitted into our model by using linear approximations to these taxes to make the net prices correspond to marginal prices and differences between marginal and average prices be compensated using additional lump-sum taxes. In our research however, instead of modelling the income tax as a progressive tax, we break down the tax into six separate taxes on each of the household groups. Income taxes in our model is therefore the combination of all these six taxes on the household group.

G. PERFECT COMPETITION IN THE MARKET AND NORMAL PROFIT

The model makes an assumption of perfect competition and assumes each firm in the economy makes zero excess profit. An oligopolistic industry with quantity setting firms can be fitted into the model by showing that the behaviour of these firms corresponds to that of perfectly competitive firms except for a mark-up on the cost price of the output. Mark-up will depend on the price elasticity of the industry demand curve and the number of firms in the industry. We can represent these mark-ups as a special tax, the revenue of which is returned to the owners of the firm.

Decreasing returns to scale can also be implemented by the inclusion of an additional factor in order to make sure constant returns to scale holds with respect to all inputs. Normalization will result in expenditure on these factors being identified with excess profits resulting from decreasing returns to scale.

For purposes of our analysis however, we felt that perfect competition and the constant returns to scale assumption is tolerable enough in meeting our objectives
of the tax reform evaluation. We therefore kept this assumption.

E. RELATIVE VS ABSOLUTE PRICES

In our model, only relative price changes matter. This was actually in line with the traditional view on tax incidence analysis as expressed by Musgrave (1959).

The use of relative prices is based on the assumption that the individual burden of a change in the average price level is zero if all money is in the form of transaction money. This implies that all assets and liabilities are fixed in real instead of money terms.\(^{82}\)

It was also felt that the inclusion of absolute price level would imply for dynamic considerations, since changes in the average price level (inflation) cannot be dealt with adequately within a static context.

Furthermore, in cases where only real prices matter, the concept of tax shifting is of limited use only. This is because households will not be able to escape the tax burden.\(^ {83}\) In our model, we would be more interested in analysing the impact of a tax burden, rather than tax shifting.

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\(^{82}\) Which is equivalent to the assumption that demand and supply functions are homogeneous of degree zero.

\(^{83}\) For example, even if the increase in income tax is fully shifted forward and does not affect the wage rates of a household, the household would ultimately have to bear the tax in the form of price increases in the goods consumed.
3.4. CONCLUSION

Most models used in modern public economics are static and involve the assumption of competitive equilibrium which ensures market clearing. A great advantage of this type of model is that it forces the analyst to take general equilibrium responses into account. It has been frequently criticised for its failure to capture dynamic issues.

A purely static model like ours could however be interpreted as an intertemporal model. With the strong assumption of rational expectations, competitive behaviour and no market failure, we could assume that the economy is on an efficient growth path and government intervention would then be associated with efficient revenue raising and redistribution rather than the direct concern over the rate of growth. Market failure which is the main element under the dynamic model could never be captured in a static model like ours. But, market failure and an inefficient growth path are thought to be better addressed directly rather than attempting to change the rate of growth by some other policy (Newbery and Stern, 1987).

It is often said that a model which assumes perfect competition conditions like ours would be more appropriate for a market economy with a few uncorrected market failures in the long-run equilibrium at full employment. This model would therefore seem to be quite inappropriate to be used for a developing economy, where the problems are quite different. (see for example Newbery, 1987). It had however been shown by Mirlees (1971) and Little and Mirlees (1974), that the same basic techniques can be usefully applied to the analysis of tax reform in developing countries.
The discussion on the limitation of marginal analysis and the linear relationship assumption has given the impression that this type of model is quite weak in analysing the impact of tax reform. On the contrary, Ahmad and Stern (1984, 1987) had asserted that the marginal approach could be very effective in analysing marginal tax reform. Their studies on the marginal tax reform in India using this marginal approach were very well regarded in the tax literature. They had to qualify the strength of the marginal analysis for its inability to analyse the effect of substantial changes.

Newbery and Stern (1987) stressed that the greater data requirements and the stronger assumptions that need to be used in the nonmarginal analysis would normally make it less robust compared to the marginal analysis.

The program for our model was written in Pascal language and is available in diskettes for use with a personal computer. It requires a hard disk to operate as it utilises a large memory. The running time is about 5 minutes. The program must run once to determine the economic equilibrium first (for about 180 seconds) before running again to determine the effect of the tax instruments changes.
CHAPTER 4

MODEL CALIBRATION AND THE CONSTRUCTION OF
THE BENCHMARK EQUILIBRIUM DATA SET

4.1. INTRODUCTION

This chapter outlines the benchmark equilibrium data sets used in the model. It describes the process of constructing the data set\textsuperscript{1}, to finally arrive at both benchmark equilibrium data sets for the firms as well as the households sectors. The source of these original data will also emerge as the discussion goes on. To check if the benchmark data set would balance, comparison will be made between the benchmark data sets of households, firms and the Treasury. Finally, there is a discussion of the parameters used in the model, particularly the elasticities.

The size of the general equilibrium model and its integrated structure makes it impossible to simultaneously estimate all parameter values\textsuperscript{2}. It is not possible to use extensive excluded variables as identifying restrictions because of the interdependence in the model. Single equation estimation will not be acceptable\textsuperscript{3}. To achieve equilibrium, parameter values for equations will be calculated from observed data after adjustments are made using the equilibrium conditions of the model.

\textsuperscript{1} each step will be illustrated, including data manipulation and adjustments
\textsuperscript{2} using conventional simultaneous equation econometric techniques.
\textsuperscript{3} as parameter estimates will not necessarily generate an equilibrium, parameter values for equations will be calculated from observed data
Obtaining a detailed data set\(^4\) consistent with the equilibrium solution concept of the model involves a substantial extension and reorganization of Malaysian economic statistics. Raw data in its disaggregated form pose difficulties in the collection process. The absence of integrated detailed microeconomic data on consistent classification is also a major difficulty. For example, the data classification used in the Input-Output Tables is not consistent with the format of the National Accounts which report gross and net national income. Taxation and subsidies, neglected in the statistics\(^5\), had to be fitted into the main statistics data set.

4.2. AN OVERVIEW OF THE BASIC VARIANT MODEL

This is a static model for ten Malaysian industries and a similar number of commodities. There are two primary factors; namely capital, six categories of labour services and eight households sectors\(^6\). The foreign sector is treated just as another private household\(^7\). All capital and labour services are owned by the six private households and the foreign sector (in the case of capital services) which receive income from their rental. Industry's production possibilities are represented by substitutable production functions describing requirements of primary factors, and by fixed intermediate production coefficients.

\(^4\) containing production decision of firms (industry), consumption decisions of households and taxes paid on transactions

\(^5\) Retrieved from various reports published by each individual tax authority

\(^6\) i.e. six private sectors, a public sector and a foreign sector.

\(^7\) Supplying goods and services in the form of imports to the economy and consuming goods in the form of export.
The Malaysian tax system has been incorporated into the model by representing each legal tax in model equivalent form. Corporate tax is treated as a differential tax on income earned by households, specific excise and customs duties as *ad valorem* taxes on both the final and intermediate use of products, general sales taxes on manufacturers as a tax on producer cost. Income taxes are treated as charges on household income imposed at an *ad valorem* rate\(^8\).

Private households consume goods and services produced by industries. In the model, it is assumed that the household sectors can not import directly but can only obtain imported goods and services from the Firm sector. The excess of income over expenditures will be saved through government saving institutions\(^9\) or in the form of government bonds.

The public sector is only the consuming part of the treasury\(^10\). The public sector also pays for capital services, makes fixed loans repayment and imports capital in the form of long term loans. The Treasury collects taxes to finance public sector expenditures. The deficit in expenditures of the public sector is financed by government saving institutions, government bonds and foreign loans.

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\(^8\) Which is the average effective tax rate for each catagories of taxpayers ( tax brackets ).

\(^9\) Such as Employees provident funds, Post office Saving bank and the National Trust fund

\(^10\) Who consume goods and services on behalf of the government.
A. SIMPLE ILLUSTRATION OF THE BENCHMARK EQUILIBRIUM DATA SET

To give a basic understanding of the equilibrium concept, we attempt an illustration of the relationship between the sectors in the economy in a diagramatic form as shown on Figure 2.

The economy basically consists of the firms sectors and the households sectors. The firms sectors consist of ten industries representing the total production unit in the economy. The private sector consist of six classes of households groups representing the total households in the economy. The public households sector represents the expenditure wing of the government. The foreign household sector represents the rest of the world. All sectors (except the public sector) supply goods and services into the market. It is in this market that the tax wedge comes into the picture. Taxes are imposed either on consumption (on the buyer) or on the supply (sales) of goods and services. All sectors in the economy thus have to pay taxes in one way or another.

THE FIRMS SECTOR

The firms or production sector produces goods and services for the economy in the form of intermediate goods for their own use and final goods for final consumers. In order to do this, they have to purchase raw materials from among themselves and might also have to import some of the inputs. Besides, they also rely on some labour and capital services supplied by the household sectors. Some of the capital services are also

\[^{11}\] Which includes private households, public as well as foreign households.
supplied by the foreign household\textsuperscript{12}. With M$ 195,479 million worth of production output created in 1988, a total of M$ 68,833 million has been used by the firms sector as intermediate goods\textsuperscript{13}. The value added by the sector amounted to M$ 81,128 million\textsuperscript{14} and imports to M$ 44,958, making the total goods supplied to the final consumers worth about M$ 133,792\textsuperscript{15}.

THE HOUSEHOLDS SECTOR

The households sector (which is also the final consumer) earned income from selling their services\textsuperscript{16}. Goods worth M$ 65,574 million were supplied to private households in 1988. Private households earned income from the supply of labour worth M$ 35,112 million which bear income taxes amounting to M$ 3,866 million\textsuperscript{17}. They also earned a capital income of M$ 34,070 million, which bear corporate taxes worth M$ 3,992.5 million.

\textsuperscript{12} This, for tax purposes, had been treated as capital services supplied by the households sector.

\textsuperscript{13} Excluding M$ 26,444 millions of own sectors input.

\textsuperscript{14} Including M$ 11,946 millions supplied by the foreign sector ( but exclude tax elements ).

\textsuperscript{15} Including consumption of private and public household and foreigners in the form of export ( but exclude tax element ).

\textsuperscript{16} Labour and capital and also from goods imported into the country in the case of the foreign sector.

\textsuperscript{17} Including employees' contribution to the provident funds.
THE PUBLIC SECTOR AND THE TREASURY

The public sector received income from the Treasury who in turn earned income from tax revenue. The Treasury collected taxes from final goods transactions and taxes on the income of households. Taxes were collected in the form of Manufacturers Sales tax worth about M$ 6,009 million, import tax worth M$ 2,9496 million, export tax worth M$ 1,215 million, Corporate tax worth M$ 5,618 million, Income taxes on labourers worth M$ 3,866 million and Employers provident funds contribution worth M$ 3,356 million. They spent M$ 11,314 million on goods and services, M$ 6,626 million on labour services and M$ 6,315 million in the form of capital services. The public sector also imports goods and services worth approximately M$ 2,300 million.

THE FOREIGN SECTOR

The Foreign sector earned income in the form of imports to Malaysia and also some capital income. They import and export goods and services into and out of Malaysia, the difference between these two accounts determining the deficit or surplus in the Balance of Payments for Malaysia. The Foreign sector earned income

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18 Between firms and households, including foreign households who import and export

19 From labour and capital services, assuming that income from labour and capital services only accrue to the households sectors.

20 Indirectly in the form of foreign loans

21 From the supply of capital services to the industry and public sector.
from imports\textsuperscript{22} worth M$ 44,958 million, which bear import taxes worth M$ 2,949 million. They also earned income from capital services worth M$ 11,946 million which bear corporate tax amounting to M$ 1,626 million. They spent\textsuperscript{23} M$ 56,904 million on goods and services in the form of export which bear export taxes worth M$ 1,626 million.

\textsuperscript{22} Or exports by foreign countries into Malaysia

\textsuperscript{23} Which form the exports of Malaysia to foreign countries
FIGURE 2
A SIMPLE ILLUSTRATION OF THE BENCHMARK EQUILIBRIUM DATA SET

PRIVATE SECTORS

<table>
<thead>
<tr>
<th></th>
<th>INCOME</th>
<th>CONSP</th>
<th>TAXES</th>
</tr>
</thead>
<tbody>
<tr>
<td>LABOUR</td>
<td>35,112</td>
<td>-</td>
<td>3,866</td>
</tr>
<tr>
<td>CAPITAL</td>
<td>34,070</td>
<td>-</td>
<td>3,992</td>
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<td>FINAL GD</td>
<td>-</td>
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<td>-</td>
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<tr>
<td>TOTAL</td>
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FIRMS SECTORS

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FOREIGN SECTORS

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<td>CAPITAL</td>
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PUBLIC SECTOR

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<td>-</td>
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<td>-</td>
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<tr>
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</table>

Source: Constructed from the benchmark data sets used.
4.3. THE CONSTRUCTION OF A BENCHMARK EQUILIBRIUM DATA SET

A. THE BASIC STEPS

The basic format and structure of the benchmark equilibrium data set is based on the Input-Output Table for Malaysia. However as the latest Table available was only for 1983, we had to rely on other sources as well in order to update, complement and counter-check the data. This made the data source varied and in some cases necessitated some further adjustment especially to balance the accounts.

I. PRODUCTION SIDE DATA

To construct the firms equilibrium data set, we basically source the following references:

a. INTERMEDIATE GOODS TRANSACTION OF FIRMS

The 1983 Input-Output Table was reclassified into ten industries sector. It was then updated using the 1988 row and column totals based on the National Accounts obtained from the 1988 year book of Statistics using RAS procedures. Figures for investment goods consumption were partly obtained from the last column of the Input-Output Table which was allocated horizontally based on the capital goods consumption of each of the firms.

b. VALUE ADDED BY INDUSTRIES

Figures for labour and capital costs of the firms sector were obtained from the combination of Input-Output Table, National Accounts, Households Income Survey and special statistics from the Prime Minister’s Department. Some reclassification, allocation and adjustment had to be made on the data to balance the accounts.
c. FINISHED GOODS AND INDUSTRIES OUTPUT

Industries’ output represents the total output of each firm which includes imported goods. Industries’ output figures were obtained by taking into account own sector consumption, intermediate goods, imported goods and value-added. Besides the Input-output Table, figures from the National Accounts and other related statistics were referred to and used for comparison and reconciliation. Total industries output in selling prices always need to equal total costs.

II. HOUSEHOLDS OR DEMAND SIDE DATA

Households demand for goods and services account for all consumption in the market. Except for the public household sector, all other households consumed only final consumers goods. Public households consume labour and capital services as well as importing goods direct from overseas.

a. HOUSEHOLDS DEMAND FOR GOODS AND SERVICES

The firms’ production figures were used as the basis of households’ consumption based on the assumption that the total supply of the industry always equals households’ consumption expenditures.

b. HOUSEHOLD EXPENDITURE MATRIX

Private households consumption expenditures were determined from the expenditure survey for West Malaysia and East Malaysia for 1980 and 1982 respectively. The figures were updated based on the 1988 total consumption expenditures which are based, in turn, on the figures obtained in the Yearbook of Statistics 1988. In the
updating, the Engel curve effect was taken into account while determining the consumption pattern of the private households. The public households sector's consumption were obtained from actual public sector expenditures statistics of 1988, accounting for both operating and development expenditures. Foreign sector expenditures were determined from the export figures of Malaysia obtained in the 1988 Yearbook of Statistics.

c. HOUSEHOLDS DISPOSABLE INCOME

Private households obtained income from capital services as well as wages. The total wages and capital costs figures of the industry were used as the basic source. Households income survey 1984 and 1987 were used to determine the income structure of households. This was used as the basis of allocating the wages and capital costs among different classes of private households, based on the assumption that total income should equal total value-added of industries. In the case of Foreign households, the actual figures of capital income were used. Public sector consumption of labour and capital services were based on actual statistics obtained from the Prime Minister's Department.

III. THE TREASURY AND TAXATION

The Treasury collected taxes from the Firms as well as the Households sectors. Taxation is defined as the wedge or difference between Firms output value and Households income.

a. TAXES ON THE FIRMS SECTOR

Figures for Manufacturing Sales taxes, Import taxes, Excise duties and primary commodities taxes were
obtained directly from the Royal Customs and Excise Department Annual Report and the 1988 Yearbook statistics. Some adjustment had been made to make sure that the firms accounts and the households accounts balanced horizontally. Figures for Payroll tax (which is actually an EPF contribution) were calculated directly based on wages bills and households gross wages (11% in the case of the former and 9% in the latter).

b. TAXES ON THE HOUSEHOLDS SECTORS

Incomes taxes on households were obtained from the Inland Revenue Department Report for 1987 and were updated taking into accounts the average rate of growth in the economy in 1988 as well as the 1988 Yearbook Statistics figures for total direct taxes. Corporate tax portion were obtained from the actual tax bills reported in the 1988 Yearbook of Statistics and allocated to each individual household based on the income level of each group. Corporate tax on the foreign sector takes up the balance of the corporate taxes.

B. RATIONALE FOR THE SELECTION OF DATA SOURCES

We regard the 1988 Yearbook of Statistics and the National Accounts as the most crucial sources of data as it is the most up-to-date and reliable. We however need to use the 1983 Input-Output Table as the base of our benchmark data construction as it provides the most reliable structure and also dictates the relationship between agents in the economy.

We resort to the Households Income and Households Expenditure Surveys to obtain the details of the classification of incomes and expenditures of households
which were not available in the other statistics. The data however need extensive manipulation and readjustment to balance accounts. The Inland Revenue Department Annual report and the Royal Customs and Excise Department Annual Report were used to obtain data for the direct and indirect taxes as they are comprehensive and allow us to obtain the most detailed classification. It however requires some updating using the 1988 statistical figures on total taxes.

C. BACKGROUND OF THE BENCHMARKS DATA CONSTRUCTION WORKS

The basic assumption made in the benchmark data construction is that the economy is in equilibrium. This implies that model equilibrium conditions must be satisfied by any data used to determine parameter values. In a benchmark equilibrium data set, all equilibrium conditions are satisfied as follows:

* In the firm sectors\(^{24}\), total income of each firm (sector) in the economy equals its expenditures (total production costs).
* In the household sectors\(^{25}\), total expenditures of each household always equals its income.
* Total supply by the firms (industry) always equals demand by household and the firms themselves.
* Total endowment of households must also always equal demand of labour services by the firms.
* Taxation will come into the market as an interference.

---

\(^{24}\) With the assumption of perfect competition and normal profit.

\(^{25}\) With the assumption of utility maximisation behaviour.
It accounts for the difference between:
* Price paid by the household and the income received by the firms; and
* Income received by the households from the supply of labour services and expenses paid by the firms in obtaining those services.

**D. PROBLEMS IN THE BENCHMARK DATA CONSTRUCTION WORKS**

In order for these equilibrium conditions to be satisfied in our benchmark data set, various adjustments are necessary. The blocks of data used were available separately in the National Accounts and related sources and had not been arranged on any synchronized form. These data sets need to be modified so as to become mutually consistent with each other. In certain cases, prior changes had to be made on that basic data clearly at variances with the model before mutual consistency adjustments to data blocks could be undertaken.

The most critical adjustments involved reclassifying inconsistent data classifications occurring in the data source. These difficulties arose because government economic statistics of economy-wide activity were constructed primarily with macroeconomic and not microeconomic policies in mind. The full documentation of the sources and resulting manipulation of data is discussed in the following section.

One crucial problem related to the nature of the model used which is static in nature is the absence of capital accumulation. Capital stock had been assumed to be fixed. Saving had to be assumed to have taken place in the form of the purchase of investment goods or capital goods. This is contrary to the actual observation in the Malaysian economy.
D. BASIC DATA SOURCE IN THE BENCHMARK DATA CONSTRUCTION WORKS

Data for the construction of the benchmark equilibrium data sets for Malaysia were obtained from various sources as follows:
- Input-Output Tables 1983.
- Mid-term Review, of the Fifth Malaysia Plan.
- Public sector employment data obtained from the Economic Planning Unit.

---

26 All the above references are the publication of the Statistics Department of Malaysia.
27 published by the Treasury department.
28 published by the Inland Revenue Department.
29 published by the Customs and Excise department.
30 published by the Economic Planning Units of the Prime Minister Department.
31 published by the Malaysian Central Bank.
Data for the benchmark equilibrium were constructed individually for each of the sector in the economy and fitted into the format.

4.4. BENCHMARK EQUILIBRIUM DATA SET FOR THE FIRMS (INDUSTRY) SECTOR.

After consolidating intermediate goods, imports, capital costs and wages bills, we obtained the industries total output, which enabled us to construct the final benchmark equilibrium data for the firms' sector.

There were 68 items on the row list and 73 items on the column list of the 1983 Input-Output Table. These items were regrouped to fit into the 18 catagories on the benchmark equilibrium data set. The reclassification was made by combining industry catagories as shown in Appendix B. The detailed contents of goods and services in each individual catagory of sector used in the benchmark data set is shown on Appendix C.

Taxes paid by the firms sector do not enter the picture here but will be presented separately as the wedge between the producers output values and the households consumptions.

Table 4.1 below presents the firms sector's accounts which forms the industries side of the benchmark data set.
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<th>Hsld</th>
<th>Inv</th>
<th>Oth</th>
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<th>Oth</th>
<th>Prim</th>
<th>Comm</th>
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Source: Intergrated from various table described in the text.
4.5. BENCHMARK EQUILIBRIUM DATA SET FOR THE HOUSEHOLDS SECTORS

The households sector consists of six categories of private, public, and foreign households. Each private category of household earned income from selling their endowment in the form of labour and capital services\(^{32}\). Private households were assumed to have spent all their income\(^{33}\). The foreign household earned income from their imports into Malaysia. They, in turn, spent their income on goods exported from the firms sector. The foreign sector also earned some capital income. The difference between import (which includes capital services) and export is treated as deficit or surplus in the balance of payments. The public sector also earned income from the treasury\(^{34}\), and, in turn, spent it on goods and services supplied by the firms' sectors.

The private, the public, and the foreign sectors' expenditures were integrated into total consumption in the economy. This was adjusted to exactly match total industries output.

The private and the foreign sectors' income figures were consolidated and adjusted to balance with the households consumptions and the total value added of the industries sectors.

---

\(^{32}\) Provided to the firms and the other household sectors.

\(^{33}\) On expenditures which includes investment goods (savings).

\(^{34}\) Which collect taxes from the firms in the form of commodities taxes, from private household in the form of income tax and corporate taxes.
After consolidating all these sets of figures, we obtained a final benchmark data set for the household sectors, which forms a part of the households portion of the economy as shown in the following table.

### TABLE 4.2

**BENCHMARK EQUILIBRIUM DATA SET FOR THE HOUSEHOLD SECTOR**  
( IN M$ MILLIONS )

<table>
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<tr>
<th>purchased by</th>
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<th>Med Incm</th>
<th>High Incm</th>
<th>Top brkt</th>
<th>Entrepr</th>
<th>Foreign</th>
<th>Total</th>
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Source: Integrated from various tables described above.
4.6. THE BENCHMARK EQUILIBRIUM DATA SET FOR THE TREASURY

The Treasury receives income from taxes paid by consumers and households. Taxes were determined from actual figures of direct and indirect taxes obtained from the Inland Revenue Department Annual Report, Customs and Excise Department Annual Report and the 1988 Year Book Statistics published by the Statistics Department.

The taxes collected from the households are consolidated into a Table as follows. These taxes account for the difference between the households' income and the wages and capital services bills of the industries. In the case of the foreign households, the taxes are related to the export transaction and the corporate tax on capital income. The public sector only pays taxes in the form of Payroll tax (EPF).
## TABLE 4.3

EXPENDITURES ON TAXES OF HOUSEHOLDS IN 1988
(in M$ MILLION)

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<th>High Incm</th>
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<td>0</td>
</tr>
<tr>
<td>Othgoods</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Petroleum</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1148</td>
<td>1148</td>
<td></td>
</tr>
<tr>
<td>Othserv</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Prcommodt</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>67</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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</tr>
<tr>
<td>Unskld lab</td>
<td>375.1</td>
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<td>1052.1</td>
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<td>802.9</td>
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<tr>
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<td>807.7</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>901</td>
</tr>
<tr>
<td>Topmgmt</td>
<td>3.5</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>716.2</td>
<td>0</td>
<td>0</td>
<td>720</td>
</tr>
<tr>
<td>Ownerent</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>487.4</td>
<td>0</td>
<td>487</td>
</tr>
<tr>
<td>Capservs</td>
<td>0</td>
<td>407.3</td>
<td>97.04</td>
<td>534.8</td>
<td>1571</td>
<td>489.9</td>
<td>892.2</td>
<td>1626</td>
<td>5618</td>
</tr>
<tr>
<td>Imports</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>729</td>
<td>407</td>
<td>1149</td>
<td>1338</td>
<td>2379</td>
<td>1206</td>
<td>1380</td>
<td>2841</td>
<td>11428</td>
</tr>
</tbody>
</table>

Source: Integrated from various sources described above.
Taxes collected from the firms sector are consolidated into the following Table. These comprise taxes on the manufactured goods and services, the Payroll tax on wages bills and taxes on imported goods.

Again, these taxes account for the difference between capital costs and the capital income (after taking into account corporate taxation). In the case of Import taxes, it accounts for the difference between the import value and the import income of foreigners after taking into account the balance of payments. In the case of output taxes, it takes into account the difference between the households’ consumption and the firms’ output value.
## TABLE 4.4

**EXPENDITURES ON TAXES BY FIRMS IN 1988**

( in M$ MILLION )

<table>
<thead>
<tr>
<th>purchased by</th>
<th>Food</th>
<th>Bev</th>
<th>Clot</th>
<th>Mfg</th>
<th>Hsld</th>
<th>Inv</th>
<th>Oth</th>
<th>Petr</th>
<th>Oth</th>
<th>Prim</th>
<th>Tot.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food</td>
<td>147.1</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>BevTobco</td>
<td>0</td>
<td>1130.7</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Clotwear</td>
<td>0</td>
<td>0</td>
<td>160.0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>MfgDurable</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>931.6</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Hsldserv</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>105.13</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Invsgood</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Othgoods</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Petroleum</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Othserv</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Prcommot</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Unskld</td>
<td>137.9</td>
<td>14.3</td>
<td>29.0</td>
<td>150.7</td>
<td>70.5</td>
<td>42.2</td>
<td>230</td>
<td>16.2</td>
<td>198</td>
<td>174</td>
<td></td>
</tr>
<tr>
<td>Semiskld</td>
<td>61.9</td>
<td>6.4</td>
<td>13.0</td>
<td>67.7</td>
<td>31.6</td>
<td>18.9</td>
<td>103</td>
<td>7.3</td>
<td>89</td>
<td>78.3</td>
<td></td>
</tr>
<tr>
<td>Skldlab</td>
<td>47.9</td>
<td>5.0</td>
<td>10.1</td>
<td>52.4</td>
<td>24.5</td>
<td>14.7</td>
<td>80</td>
<td>5.6</td>
<td>68.9</td>
<td>60.6</td>
<td></td>
</tr>
<tr>
<td>Topmgnt</td>
<td>37.4</td>
<td>3.9</td>
<td>7.9</td>
<td>40.9</td>
<td>19.1</td>
<td>11.4</td>
<td>63</td>
<td>4.4</td>
<td>53.8</td>
<td>47.4</td>
<td></td>
</tr>
<tr>
<td>Ownerent</td>
<td>55.97</td>
<td>5.8</td>
<td>11.78</td>
<td>61.2</td>
<td>28.6</td>
<td>17.1</td>
<td>94</td>
<td>6.6</td>
<td>80.4</td>
<td>70.8</td>
<td></td>
</tr>
<tr>
<td>Capserv</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Imports</td>
<td>128.7</td>
<td>360.4</td>
<td>103.3</td>
<td>354.4</td>
<td>27.6</td>
<td>0</td>
<td>1389</td>
<td>586</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>616.9</td>
<td>1526.5</td>
<td>335.1</td>
<td>1659</td>
<td>307</td>
<td>104</td>
<td>4592</td>
<td>676</td>
<td>490</td>
<td>696.4</td>
<td></td>
</tr>
</tbody>
</table>

Source: Integrated from various sources described above.
4.7. COMPARISON BETWEEN THE ROWS TOTAL OF HOUSEHOLDS WITH THE FIRMS SECTOR ACCOUNTS

The firms' row total on the upper part of Table 4.19 indicates total final goods supplied by the firms to the households sector. The row totals on the lower part, on the other hand, indicate total wages and capital expenses paid to the households sector.

The household sector rows total on the upper part of the Table indicates total consumption of goods and services\textsuperscript{35}. The lower part indicates total income derived from the sales of endowment.

The difference between the household rows total and the firms rows total should be exactly equal to the taxes imposed on the transactions made between the households and the firms. Table 4.5. shows this.

\textsuperscript{35} Supplied by the firms
## TABLE 4.5

**COMPARISON BETWEEN ROWS TOTALS OF HOUSEHOLDS AND FIRMS SECTORS**

( in M$ MILLION )

<table>
<thead>
<tr>
<th></th>
<th>Net income of firms</th>
<th>Net income of household</th>
<th>taxes paid to treasury</th>
<th>Tax rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food</td>
<td>-17900</td>
<td>18047</td>
<td>147</td>
<td>0.8212</td>
</tr>
<tr>
<td>Bev &amp; Tobacco</td>
<td>-1941</td>
<td>3072</td>
<td>1131</td>
<td>38.4563</td>
</tr>
<tr>
<td>Clo &amp; Ft. wears</td>
<td>-4174</td>
<td>4334</td>
<td>160</td>
<td>3.8333</td>
</tr>
<tr>
<td>Mfg Durables</td>
<td>-25847</td>
<td>26778</td>
<td>932</td>
<td>3.6058</td>
</tr>
<tr>
<td>Held services</td>
<td>-2933</td>
<td>3038</td>
<td>105</td>
<td>3.5800</td>
</tr>
<tr>
<td>Invest. goods</td>
<td>-17904</td>
<td>17904</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Other goods</td>
<td>-7438</td>
<td>10071</td>
<td>2633</td>
<td>35.3993</td>
</tr>
<tr>
<td>Petroleum</td>
<td>-6467</td>
<td>8251</td>
<td>1784</td>
<td>27.5862</td>
</tr>
<tr>
<td>Other services</td>
<td>-14776</td>
<td>14776</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Prim. commdt.</td>
<td>-27258</td>
<td>27523</td>
<td>265</td>
<td>0.9722</td>
</tr>
<tr>
<td>Inf. labours</td>
<td>11785</td>
<td>-11785</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Unsk. labours</td>
<td>9672</td>
<td>-7181</td>
<td>2491</td>
<td>25.7648</td>
</tr>
<tr>
<td>Sm. sk. labours</td>
<td>4341</td>
<td>-2805</td>
<td>1536</td>
<td>35.3836</td>
</tr>
<tr>
<td>Skill labours</td>
<td>3360</td>
<td>-2090</td>
<td>1271</td>
<td>37.8274</td>
</tr>
<tr>
<td>High mgmt.</td>
<td>2627</td>
<td>-1618</td>
<td>1009</td>
<td>38.4088</td>
</tr>
<tr>
<td>Entrepreneurs</td>
<td>3925</td>
<td>-3006</td>
<td>919</td>
<td>23.4140</td>
</tr>
<tr>
<td>Capital service</td>
<td>45319</td>
<td>-39701</td>
<td>5618</td>
<td>12.3966</td>
</tr>
</tbody>
</table>

Source: Integrated from various tables described above.

The above exercise enables us to make sure that the benchmark data set satisfies the condition for equilibrium which is a crucial requirement before the data is fitted into the model.
4.8. BASIC PARAMETERS USED IN THE MODEL

In an analysis which focuses on the marginal analysis, the role of elasticities in determining the result of the calculations is crucial. It is thought necessary, therefore, to describe these elasticities, their meaning and justification for being used.

A. INCOME ELASTICITIES OF HOUSEHOLDS

Income elasticities prescribe the projected responses of each class of households on changes in their income. Particularly, in the case of our tax reform analysis, income elasticities will dictate the household reaction in view of some small drop in their income that is caused by some small increase in each of the tax instruments.

Most of the elasticities used for the six categories of private households, were derived from actual findings of the expenditures surveys analysis conducted by Kwok at the Malaysian Statistical Department (1986). Almost no adjustment was made on the income elasticities in relation to the demand for goods and services. Some adjustment had, however, been made on the income elasticities in relation to demand on labour, capital services and also imports. This had to be done to make sure that the row sum of the income elasticities

---

1 Namely food, beverage and tobacco, clothing and footwear, manufacturing durable, household services, investment goods, other goods, other services and primary commodities.

2 All the six categories of labour services (informal labours, unskilled, semi-skilled, skilled labours, top management, owner entrepreneurs and capital services.)
of each of the household groups would add to one\(^3\). The elasticities figures assigned for the public sector and foreign household were based on the set used by Keller on a similar analysis (1980).

Income elasticities used in the model are shown in Table 4.6.

\[^3\text{Notice that the row sum of the income elasticities for each of the households groups in Table 4.20 does not add to one. This is because the income elasticities in relation to the demand for labour services was not shown in the Table.}\]
### TABLE 4.6

MODIFIED INCOME ELASTICITIES OF HOUSEHOLDS IN 1988

<table>
<thead>
<tr>
<th>HOUSEHOLDS</th>
<th>Public</th>
<th>Lab Low</th>
<th>Med Incm</th>
<th>High Incm</th>
<th>Top brkt</th>
<th>Entre pren</th>
<th>Foreign</th>
</tr>
</thead>
<tbody>
<tr>
<td>purchased by</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food</td>
<td>1.0</td>
<td>0.286</td>
<td>0.453</td>
<td>0.470</td>
<td>0.487</td>
<td>0.648</td>
<td>0.636</td>
</tr>
<tr>
<td>Bev&amp;Tobco</td>
<td>1.0</td>
<td>0.586</td>
<td>0.615</td>
<td>0.397</td>
<td>0.534</td>
<td>0.310</td>
<td>0.568</td>
</tr>
<tr>
<td>Clot&amp;Fwr</td>
<td>1.0</td>
<td>1.180</td>
<td>1.206</td>
<td>1.423</td>
<td>1.178</td>
<td>1.342</td>
<td>1.217</td>
</tr>
<tr>
<td>MfgDurble</td>
<td>1.0</td>
<td>1.740</td>
<td>1.348</td>
<td>1.618</td>
<td>1.708</td>
<td>1.502</td>
<td>1.363</td>
</tr>
<tr>
<td>HsIdserv</td>
<td>1.0</td>
<td>0.938</td>
<td>0.993</td>
<td>0.934</td>
<td>1.046</td>
<td>0.648</td>
<td>1.123</td>
</tr>
<tr>
<td>Investgds</td>
<td>1.0</td>
<td>0.938</td>
<td>0.993</td>
<td>1.414</td>
<td>0.555</td>
<td>0.594</td>
<td>1.090</td>
</tr>
<tr>
<td>Othgoods</td>
<td>1.0</td>
<td>1.213</td>
<td>1.313</td>
<td>1.323</td>
<td>1.192</td>
<td>0.930</td>
<td>0.920</td>
</tr>
<tr>
<td>Petroleum</td>
<td>1.0</td>
<td>1.203</td>
<td>1.270</td>
<td>1.410</td>
<td>1.030</td>
<td>1.314</td>
<td>1.209</td>
</tr>
<tr>
<td>Othserv</td>
<td>1.0</td>
<td>1.280</td>
<td>0.707</td>
<td>0.487</td>
<td>1.259</td>
<td>1.353</td>
<td>0.755</td>
</tr>
<tr>
<td>Prcommodt</td>
<td>1.0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>


*Income Elasticities on Food Items*

Food is the most inelastic good in the market. As income level rises, food becomes more elastic, reflecting the decrease in significant foods expenditures to each income group. In the case of a public household, however, income elasticity is assumed to be unity implying that increases in the public budget are being spent in proportion to initial expenditures. In the case of a foreign household, a very small figure is assumed to show fixed food consumption food by foreigners.
* INCOME ELASTICITIES OF BEVERAGE AND TOBACCO

Beverage and tobacco are comparably inelastic even though they are slightly more elastic than food. The same assumption applies here about the public sector and foreign income elasticities.

* INCOME ELASTICITIES OF CLOTHING AND FOOTWEAR

Clothing and footwear are relatively elastic even though they were less elastic than manufacturing durables. The same comment again applies to public and foreign households.

* INCOME ELASTICITIES OF MANUFACTURING DURABLES

Manufacturing durables are the most elastic goods in the market. They are, however, relatively inelastic to the low income group and the entrepreneurs when compared to other groups. As for the public sector and the foreign households, the same assumptions again applies.

* INCOME ELASTICITIES OF THE HOUSEHOLD SERVICES

Overall, household services is unitarily elastic to income pertubations of all group of taxpayers, except the top bracket, which shows a lower elasticity. Household services are most elastic to the entrepreneurs.

* INCOME ELASTICITIES OF THE INVESTMENT GOODS

Investment goods are also almost unitarily elastic for most household groups, except for the high income and the top brackets groups. Investment goods are relatively inelastic to the top brackets and the high income groups, showing inflexibility in investment spending. This could be explained by the mortgage payment behavior of these groups which is unavoidable and normally acts as some sort of forced saving or investment.
* INCOME ELASTICITIES OF OTHER GOODS

Other goods are considered elastic to all households groups except for the entrepreneurs which showed nearly unitary elasticity on these goods. It is difficult to interpret the behavior toward other goods, as it is comprised of some extreme goods from furniture & fixtures to metal and rubber products.

* INCOME ELASTICITIES OF PETROLEUM PRODUCTS

Petroleum products are considered elastic in relation to income changes as far as the private households are concerned. It is, however, unitarily elastic to the public household. Petroleum products are also set to be inelastic in the case of foreign household implying that demand for petroleum is not dependant on the income of foreign household.

* INCOME ELASTICITIES OF OTHER SERVICES

Other services are relatively elastic in the case of informal labour, high income and the top bracket groups. They are least elastic to the medium income group, while also inelastic for the low income and entrepreneurs group. Other services here include basic utilities, business services, personal, health and public services.

* INCOME ELASTICITIES OF PRIMARY COMMODITIES

This elasticity is only significant to the foreign household as most primary commodities are exported. The low elasticity here reflect that demand of primary commodities by the foreign household does not depend on their income.
B. SUBSTITUTION ELASTICITIES

As elasticities of substitution figures are only estimated, it would be helpful to minimize their role in the model. We therefore group goods and services and use the concept of 'nested-constant elasticity of substitution' (NES) for each group of goods.

I. ELASTICITIES OF SUBSTITUTION AND UTILITY STRUCTURES OF THE HOUSEHOLDS SECTOR.

Household goods are grouped under three levels in the case of private households\textsuperscript{4}. They are arranged as follows:

+ Level 1 - Show the relationships between investment goods and other goods in relation to the total households consumption.
+ Level 2 - Show the relationships between aggregate consumption and leisure (negative labor supplies) for unskilled, semi-skilled, skilled, top management and entrepreneurial services.
+ Level 3 - Show the relationships between the consumption of various consumables goods and services\textsuperscript{5}.

The public sector is assumed to face only a single level of utility structure, reflecting the constant elasticities of substitution between all goods.

\textsuperscript{4} i.e. excluding public and foreign households.

\textsuperscript{5} Namely food, tobacco, clothing and footwear, manufacturing durables, other goods, petroleum products, primary commodities, household services and other services.
The substitution elasticities used for the households sector areas are shown in Table 4.7.

### TABLE 4.7

**SUBSTITUTION ELASTICITIES OF THE HOUSEHOLD SECTORS**

<table>
<thead>
<tr>
<th></th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public sector</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Informal labour</td>
<td>1.0</td>
<td>0.1</td>
<td>0.5</td>
</tr>
<tr>
<td>Low income group</td>
<td>1.0</td>
<td>0.1</td>
<td>0.5</td>
</tr>
<tr>
<td>Medium income</td>
<td>1.0</td>
<td>0.1</td>
<td>0.5</td>
</tr>
<tr>
<td>High income</td>
<td>1.0</td>
<td>0.1</td>
<td>0.5</td>
</tr>
<tr>
<td>Top bracket</td>
<td>1.0</td>
<td>0.1</td>
<td>0.5</td>
</tr>
<tr>
<td>Entrepreneurs</td>
<td>1.0</td>
<td>0.1</td>
<td>0.5</td>
</tr>
<tr>
<td>Foreign sector</td>
<td>3.0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

Source: Modified from Keller (1980).

*SUBSTITUTION ELASTICITIES AT LEVEL 1.*

Except for the public household which has zero substitution elasticity, and the foreign household which has an elasticity of substitution of 3, the rest of the households had unitary elasticities of substitution. The zero elasticities in the case of the public sector implies that consumption is price inelastic. The unitary elasticities between investment goods and other goods\(^6\) implies a fixed marginal propensity to save. The outstandingly high elasticities for the foreign

---

\(^6\) i.e. food, durables etc., capital and labour services for the private households.
households implies that there is an ease of substitution between competing foreign and domestic goods in foreign sector consumption\textsuperscript{7}.

\* ELASTICITIES OF SUBSTITUTION AT LEVEL 2

Except for the public and foreign households, the other households face very small elasticities of substitution reflecting the near complementarity between aggregate consumption and leisure\textsuperscript{8}. As public and foreign household do not supply labour services, this elasticity is not relevant.

\* ELASTICITIES OF SUBSTITUTION AT LEVEL 3

The partial elasticity of substitution between consumption goods\textsuperscript{9} reflects moderate substitution in the consumer demand system. Again, in the case of the foreign household, the high elasticity of substitution adopted reflects the assumed ease of substitution between competing foreign and domestic goods in foreign consumption\textsuperscript{10}. As a result of the high elasticity figure used here, all cross-price elasticities between domestic goods virtually vanish for the foreign sector\textsuperscript{11}.

\textsuperscript{7} Note that the actual elasticity used for the calculation was 3 X 100 - to reflect the proportional ratio of the total to observed consumption of the foreign household.

\textsuperscript{8} Or negative supply of labour services.

\textsuperscript{9} Food, beverage and tobacco, clothing and footwear, manufacturing durables, other goods, petroleum products, primary commodities, household services and other services.

\textsuperscript{10} As had been proven by Goldstien and Khan (1978).

\textsuperscript{11} See Keller (1980) for further discussion.
II. SUBSTITUTION ELASTICITIES AND PRODUCTION STRUCTURES OF FIRMS.

Input structure of firms are grouped into six levels in the case of food, beverage and tobacco, clothing and footwear, other goods, petroleum products and primary commodities. The levels are as follows:

+ Level 1 - shows the relationship between composite goods and services in the input structures.
+ Level 2 - shows the relationship between imported and domestically produced input in the input structures.
+ Level 3 - shows the relationship between factor input and value added.
+ Level 4 - shows the relationship between labour services and capital services.
+ Level 5 - shows the relationship between investment goods (capital goods) and capital services.
+ Level 6 - shows the relationship between labours services.

Food, beverage and tobacco, clothing and footwear, manufacturing durables, other goods, petroleum products and primary commodities are all facing the same level of production structures as above. Household services and other services faced adifferent level of production structure. Their production structures are as follows:

12 i.e. food, beverage and tobacco, clothing and footwear, other goods, petroleum products and primary commodities.
13 Various labours and capital services.
14 Informal, unskilled, semi-skilled, skilled, top management and entrepreneurial.
15 namely informal labour, unskilled, semi-skilled, skilled, top management and entrepreneurs.
+ Level 1 - shows the relationship between imported and domestically produced input.
+ Level 2 - shows the relationship between intermediate input\(^{16}\) and value-added input.
+ Level 3 - shows the relationship between labours and the capital services.
+ Level 4 - shows the relationship between investment goods and capital services in the input structures.
+ Level 5 - shows the relationship between labour services in the input structures.
+ Level 6 - shows the relationship between intermediate goods input in the input structures of the services industries.

Investment goods also face a different input structure. It is structured as follows:

+ Level 1 - shows the relationship between services and composite goods input in the industry.
+ Level 2 - shows the relationship between various type of intermediate goods in the production structures\(^{17}\) and value added\(^{18}\).
+ Level 3 - shows the relationship between capital services and other input used by the industry.

\(^{16}\) i.e. food, beverage and tobacco, clothing and footwear, other goods, petroleum products and primary commodities.

\(^{17}\) i.e. food, beverage and tobacco, clothing and footwear, other goods, petroleum products and primary commodities, manufacturing durables, household services and other services.

\(^{18}\) i.e. labours and capital services.
Level 4 shows the relationship between various types of labours and the capital services.

Substitution elasticities for the firms sectors are shown in Table 4.8.

**TABLE 4.8**

**SUBSTITUTION ELASTICITIES OF THE FIRMS SECTOR**

<table>
<thead>
<tr>
<th></th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
<th>Level 5</th>
<th>Level 6</th>
</tr>
</thead>
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<td>2.0</td>
<td>0</td>
<td>1.0</td>
<td>0</td>
<td>1.0</td>
</tr>
<tr>
<td>Bevtobcco</td>
<td>1.0</td>
<td>2.0</td>
<td>0</td>
<td>1.0</td>
<td>0</td>
<td>1.0</td>
</tr>
<tr>
<td>Clotfwear</td>
<td>1.0</td>
<td>2.0</td>
<td>0</td>
<td>1.0</td>
<td>0</td>
<td>1.0</td>
</tr>
<tr>
<td>Mfgdurable</td>
<td>1.0</td>
<td>2.0</td>
<td>0</td>
<td>1.0</td>
<td>0</td>
<td>1.0</td>
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<tr>
<td>Hsldserv</td>
<td>2.0</td>
<td>0</td>
<td>1.0</td>
<td>0</td>
<td>1.0</td>
<td>0</td>
</tr>
<tr>
<td>Invsgood</td>
<td>2.0</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Othgoods</td>
<td>1.0</td>
<td>2.0</td>
<td>0</td>
<td>1.0</td>
<td>0</td>
<td>1.0</td>
</tr>
<tr>
<td>Othservs</td>
<td>2.0</td>
<td>0</td>
<td>1.0</td>
<td>0</td>
<td>1.0</td>
<td>0</td>
</tr>
<tr>
<td>Pricommodt</td>
<td>1.0</td>
<td>2.0</td>
<td>0</td>
<td>1.0</td>
<td>0</td>
<td>1.0</td>
</tr>
</tbody>
</table>

Source: Modified from Keller (1980).

*ELASTICITIES OF SUBSTITUTION AT THE LEVEL 1*

Except for investment goods, household and other services, the other goods showed unitary elasticities implying Cobb-Douglas aggregation or fixed cost shares between total input goods and services. In these three

---

19 i.e. informal, unskilled, semi-skilled, skilled, top management and entrepreneurs.
cases, a relatively high elasticity indicates that consumption goods were substitutable for services and investment.

* ELASTICITIES OF SUBSTITUTION AT LEVEL 2

Except for the two services, all other goods show a relatively high elasticity of substitution, implying that competing domestic and foreign products are highly substitutable. Services, however, have a zero elasticity, implying that they are not substitutable to foreign services. The unitary elasticities of substitution for investment goods reflects a fixed proportion in the utilisation between services and consumption.

* ELASTICITIES OF SUBSTITUTION AT LEVEL 3

Except for the two services, all other goods have zero elasticities, implying the complementary nature of these goods. It shows that there are fixed proportions in their intermediate inputs. The unitary elasticities for the two services implied that there are fixed cost shares in the use of labors and capital services in the production of these two services. In the case of investment goods, the unitary elasticities reflect the fixed proportion between the utilisation of labour and capital services.

* ELASTICITIES OF SUBSTITUTION AT LEVEL 4

The unitary elasticities for the intermediate input goods implies a Cobb-Douglas aggregation or fixed cost shares between labour and capital services in the production of these goods. The zero elasticities for the two services and investment goods implied that there are fixed proportions between the volume of capital services and capital consumption, i.e., a Leontief function. This
assumed the complementary nature of capital services and capital goods. In the case of investment goods, a unitary elasticity reflects a fixed proportion in the utilisation of the various types of labour services.

* ELASTICITIES OF SUBSTITUTION AT LEVEL 5

The zero elasticities shown on the various input goods implied that capital goods and capital services are complementary. This means that a Leontief function existed and there is a fixed proportions between the volume of capital services and capital consumption. The unitary elasticities for the two services implied fixed cost shares between the labour services.

* ELASTICITIES OF SUBSTITUTION AT LEVEL 6

The unitary elasticities on various input goods implied that there are fixed cost shares between labors services in the production of these goods. The zero elasticities for the two services implies fixed proportions in the use of aggregate intermediate inputs goods.

Based on the income and substitution elasticities determined above, the price elasticities of the firms can be determined\(^\text{20}\) as well as the price elasticities of the

---

\(^{20}\) Which is defined at a constant output level. Price elasticities are defined as:

\[ \eta_{nm} = \beta_m \sigma_{nm} \]

- \( \eta_{nm} \) - elasticity of good \( n \) with respect to price \( m \).
- \( \beta_m \) - cost share of good \( m \) in initial situation.
- \( \sigma_{nm} \) - elasticity of substitution.
C. MARGINAL REVENUE SHARE OF HOUSEHOLDS SECTORS

Marginal revenue share is the shares of the household sectors in the distribution of the additional revenue from all transaction taxes. These shares must add up to one. This figure could be calculated based on the net income of households or it could also be specified. In our model, all marginal revenue shares are assumed to have passed to the public sector as shown in Table 4.9.

\[ \eta_{nm} = \beta_m (\eta_n \eta_m \sigma^+_{nm} - \eta_n) \]

\( \eta_{nm} \) - elasticity of good n with respect to price m.
\( \beta_m \) - income share of good n.
\( \eta_m \) - income elasticity of good m.
\( \eta_n \) - income elasticity of good n.
\( \sigma^+_{nm} \) - supernumerary elasticity of substitution.

\[^{21}\] The formula used is:
### TABLE 4.9

<table>
<thead>
<tr>
<th>MARGINAL REVENUE OF HOUSEHOLDS ASSUMPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public sector</td>
</tr>
<tr>
<td>Informal labour</td>
</tr>
<tr>
<td>Low income group</td>
</tr>
<tr>
<td>Median income group</td>
</tr>
<tr>
<td>High income group</td>
</tr>
<tr>
<td>Top bracket group</td>
</tr>
<tr>
<td>Entrepreneurs</td>
</tr>
<tr>
<td>Foreign sector</td>
</tr>
</tbody>
</table>

Source: extracted from the input of the program.

**D. MARGINAL TAX SHARES OF HOUSEHOLDS SECTOR**

Marginal tax shares are the shares of the household sectors in the distribution of Lump-sum tax. These shares must add up to zero. Similarly, this figure must be calculated beforehand. In our model, we assumed that Lump-sum tax was collected from private households in proportion to their total income in 1988. The procedure is in line with the basic method of collecting Lump-sum tax on the basis of total annual income of each of the household groups. Table 4.10 shows marginal tax shares figures used in the model. It must be pointed out that Lump-sum tax is not a real tax instrument in the economy. It has been introduced only for comparison purposes.

22 And would be counter checked by the program.
TABLE 4.10

MARGINAL TAX SHARES OF HOUSEHOLDS ASSUMPTION

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Public sector</td>
<td>1.0000</td>
</tr>
<tr>
<td>Informal labour</td>
<td>-0.0171</td>
</tr>
<tr>
<td>Low income group</td>
<td>-0.0372</td>
</tr>
<tr>
<td>median income group</td>
<td>-0.0557</td>
</tr>
<tr>
<td>High income group</td>
<td>-0.0789</td>
</tr>
<tr>
<td>Top bracket group</td>
<td>-0.2105</td>
</tr>
<tr>
<td>Entrepreneurs</td>
<td>-0.6006</td>
</tr>
<tr>
<td>Foreign sector</td>
<td>-</td>
</tr>
</tbody>
</table>

Source: Extracted from the input of the program.

E PRICE INDEX WEIGHT OF TRANSFERS

Price index weights represent the weight of goods in the price-index. The index determines the way existing transfers are compensated for price changes. These weights must add up to one. This index has been fixed by actual weightage of the public sectors consumption on each of these goods and services. This is based on the fact that all Lump-sum tax is being distributed back to the public household which is being compensated for price changes based on the price index above. The index used is as shown in Table 4.11.
### TABLE 4.11

<table>
<thead>
<tr>
<th>PRICE INDEX WEIGHT ASSUMPTION</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Food</td>
<td>0.0249</td>
</tr>
<tr>
<td>Beverage and Tobacco</td>
<td>0.0014</td>
</tr>
<tr>
<td>Clothing and Footwear</td>
<td>0.0040</td>
</tr>
<tr>
<td>Manufacturing durable</td>
<td>0.2486</td>
</tr>
<tr>
<td>Household services</td>
<td>0.0558</td>
</tr>
<tr>
<td>Investment goods</td>
<td>0.4532</td>
</tr>
<tr>
<td>Other goods</td>
<td>0.1283</td>
</tr>
<tr>
<td>Petroleum products</td>
<td>0.0196</td>
</tr>
<tr>
<td>Other services</td>
<td>0.0636</td>
</tr>
<tr>
<td>Primary commodities</td>
<td>0.0005</td>
</tr>
</tbody>
</table>

Source: Calculated base on public sector's consumption figures for 1988.

### 4.9. FINAL REMARKS

The benchmark equilibrium data and the parameters above were fitted into the computer program as inputs for the general equilibrium model. The input files were divided into two parts, namely the 'economic variables' and the 'tax variables'. The 'economic variables' showed data of each firms' income, expenditures on goods, taxes paid, elasticities of substitution, knot places and product shares. It also had data of each households income, expenditures on goods, taxes paid, marginal shares, substitution elasticities and knot places. It then plotted the tax variables for each of the tax instruments available in the economy, the tax flexibilities, marginal revenue shares, marginal tax shares, price index weight and tax weight. The format of the input file is illustrated in Appendix E.
CHAPTER 5

PRELIMINARY FINDINGS OF THE RESEARCH

5.1. INTRODUCTION

This chapter analyses and explores the initial findings of the research, particularly the output of the General equilibrium model employed in the research. The analysis begins by observing the impact on prices of the 1% increases in each of the tax instruments. This is a practical attempt to trace tax shifting and initial incidence phenomenon. The basic task here is to observe the consistency in the market behaviour as a result of the tax instrument change. This is the starting point for future data interpretation efforts. The analysis is then repeated on the data obtained after normalising the result.¹

The observations on tax revenue changes are being used as the basis of evaluating the tax revenue generation impact. Changes in real income, including real national income are being used to evaluate the efficiency impact. Finally, changes on the tax burden distribution are being used as the basis of evaluating the equity or income distribution impact of each tax instrument change.

A large change in demand/supply, output level of firms and prices changes in the economy will be of major concern in the initial observation about the finding of the exercise that follows. It will relate to the

¹ i.e. after neutralising the impact of a tax change on the public sectors income.
parameters used in the model and the benchmarks data set. It should be kept in mind that the general equilibrium result presented here may only be considered realistic for presenting the impact of tax changes after a lapse of time. The effect of tax change here is assumed to occur two to three years after the particular changes in the tax instrument.

5.2. ANALYSIS OF THE ABSOLUTE IMPACT OF TAX INSTRUMENTS CHANGES

Absolute impact here represents the actual change resulted from the 1% increased in the tax rate. Bear in mind that all changes are being measured in terms of real prices. Households' burden is being measured in terms of real income changes. Tax revenue change is also being measured in terms of tax revenue changes in real terms. In an analysis like this, where only real prices matter, the concept of tax shifting is only of limited use, because ultimately the final burden will fall on the households sectors regardless of where shifting occurs initially. Price burden is confined to the burden on prices and not individuals\(^2\). In the case of taxes on firms, a 1% tax rate increase means a 1% decrease in the prices they received. In the case of households, a 1% increase in the consumption tax rate means a 1% increase in the market prices that they have to pay.

\(^2\) i.e. we only observed the changes in prices of particular goods and all other goods as a result of the 1% change in a particular tax.
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A. CORRESPONDING CHANGES IN MKT PRICES</td>
<td>- 0.965</td>
<td>- 0.00</td>
<td>- 0.01</td>
<td>- 0.27</td>
<td>- 0.07</td>
<td>- 0.44</td>
<td>- 0.012</td>
<td>- 0.04</td>
<td>- 0.16</td>
<td>- 0.16</td>
</tr>
<tr>
<td>BEV. &amp; TOBACCO</td>
<td>- 0.038</td>
<td>0.999</td>
<td>- 0.00</td>
<td>- 0.26</td>
<td>- 0.07</td>
<td>- 0.42</td>
<td>- 0.19</td>
<td>- 0.09</td>
<td>- 0.24</td>
<td>- 0.22</td>
</tr>
<tr>
<td>CLOTH. &amp; FUR</td>
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<td>- 0.00</td>
<td>0.991</td>
<td>- 0.27</td>
<td>- 0.06</td>
<td>- 0.44</td>
<td>0.122</td>
<td>- 0.03</td>
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<td>MFG. DURABLES</td>
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<td>0.197</td>
<td>- 0.03</td>
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<td>HSLED. SERVICE</td>
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<td>- 0.006</td>
<td>0.009</td>
<td>- 0.23</td>
<td>0.890</td>
<td>- 0.46</td>
<td>- 0.28</td>
<td>0.019</td>
<td>- 0.32</td>
<td>- 0.29</td>
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<td>INVT. GOODS</td>
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<td>- 0.01</td>
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<td>- 0.04</td>
<td>0.260</td>
<td>- 0.04</td>
<td>0.002</td>
<td>- 0.05</td>
<td>- 0.06</td>
</tr>
<tr>
<td>OTHER GOODS</td>
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<td>- 0.00</td>
<td>- 0.01</td>
<td>- 0.26</td>
<td>- 0.05</td>
<td>0.510</td>
<td>- 0.019</td>
<td>- 0.03</td>
<td>0.009</td>
<td>0.002</td>
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<td>- 0.00</td>
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<td>- 0.09</td>
<td>- 0.25</td>
<td>- 0.04</td>
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<td>- 0.01</td>
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<td>- 0.09</td>
<td>- 0.48</td>
<td>0.493</td>
<td>- 0.02</td>
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<td>- 0.43</td>
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<tr>
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<td>- 0.05</td>
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<td>- 0.28</td>
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<td>UNSKILD LABOR</td>
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<td>0.001</td>
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<td>- 0.04</td>
<td>- 0.32</td>
<td>0.435</td>
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<td>0.041</td>
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<td>0.007</td>
<td>- 0.02</td>
<td>- 0.38</td>
<td>- 0.11</td>
<td>- 0.53</td>
<td>0.081</td>
<td>- 0.08</td>
<td>0.140</td>
<td>- 0.16</td>
</tr>
<tr>
<td>TOP MGMT.</td>
<td>- 0.19</td>
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<td>- 0.07</td>
<td>- 0.66</td>
<td>- 0.22</td>
<td>- 0.84</td>
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<td>- 0.15</td>
<td>- 0.49</td>
</tr>
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<td>OWNERENTREPR.</td>
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<td>- 0.07</td>
<td>- 0.72</td>
<td>- 0.23</td>
<td>- 0.90</td>
<td>- 0.34</td>
<td>- 0.14</td>
<td>- 0.16</td>
<td>- 0.52</td>
</tr>
<tr>
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<td>0.002</td>
<td>- 0.20</td>
<td>- 0.14</td>
<td>- 0.58</td>
<td>- 0.41</td>
<td>- 0.24</td>
<td>- 0.52</td>
<td>- 0.43</td>
</tr>
<tr>
<td>IMPORTS</td>
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<td>- 0.01</td>
<td>- 0.01</td>
<td>- 0.27</td>
<td>- 0.09</td>
<td>- 0.48</td>
<td>0.459</td>
<td>- 0.02</td>
<td>0.541</td>
<td>- 0.45</td>
</tr>
</tbody>
</table>

B. CORRESPONDING CHANGES IN TOTAL TAX REVENUE IN % OF NAT. INCOME

| TAX ON: | 0.128 | 0.018 | 0.029 | 0.143 | 0.056 | 0.142 | 0.253 | 0.030 | 0.186 | 0.179 |

C. CORRESPONDING HOUSEHOLDS BURDEN IN % OF NET INCOME.

<table>
<thead>
<tr>
<th>TAX ON:</th>
<th>0.687</th>
<th>0.098</th>
<th>0.158</th>
<th>0.927</th>
<th>0.359</th>
<th>1.04</th>
<th>1.36</th>
<th>0.226</th>
<th>1.00</th>
<th>1.11</th>
</tr>
</thead>
<tbody>
<tr>
<td>INFORMAL LABS</td>
<td>- 0.54</td>
<td>- 0.08</td>
<td>- 0.04</td>
<td>- 0.26</td>
<td>- 0.21</td>
<td>- 0.58</td>
<td>- 1.9</td>
<td>0.111</td>
<td>- 1.4</td>
<td>- 0.84</td>
</tr>
<tr>
<td>LOW INCOME</td>
<td>- 0.15</td>
<td>- 0.04</td>
<td>- 0.00</td>
<td>- 0.15</td>
<td>- 0.03</td>
<td>- 0.12</td>
<td>0.414</td>
<td>0.020</td>
<td>0.530</td>
<td>0.174</td>
</tr>
<tr>
<td>MEDIUM INCOME</td>
<td>- 0.07</td>
<td>- 0.03</td>
<td>- 0.019</td>
<td>- 0.02</td>
<td>- 0.03</td>
<td>- 0.10</td>
<td>0.194</td>
<td>- 0.07</td>
<td>0.177</td>
<td>0.064</td>
</tr>
<tr>
<td>HIGH INCOME</td>
<td>- 0.14</td>
<td>- 0.03</td>
<td>- 0.00</td>
<td>- 0.13</td>
<td>- 0.13</td>
<td>- 0.38</td>
<td>- 0.28</td>
<td>- 0.19</td>
<td>- 0.30</td>
<td>- 0.27</td>
</tr>
<tr>
<td>TOP BRACKETS</td>
<td>- 0.19</td>
<td>- 0.04</td>
<td>- 0.02</td>
<td>- 0.21</td>
<td>- 0.15</td>
<td>- 0.47</td>
<td>- 0.36</td>
<td>- 0.20</td>
<td>- 0.35</td>
<td>- 0.35</td>
</tr>
<tr>
<td>ENTREPRENEUR</td>
<td>- 0.28</td>
<td>- 0.05</td>
<td>- 0.05</td>
<td>- 0.66</td>
<td>- 0.32</td>
<td>- 1.1</td>
<td>- 0.68</td>
<td>- 0.36</td>
<td>- 0.62</td>
<td>- 0.77</td>
</tr>
<tr>
<td>FOREIGN</td>
<td>- 0.05</td>
<td>- 0.00</td>
<td>- 0.07</td>
<td>- 0.26</td>
<td>- 0.02</td>
<td>- 0.09</td>
<td>- 0.00</td>
<td>- 0.15</td>
<td>- 0.12</td>
<td>- 0.31</td>
</tr>
</tbody>
</table>

NATIONAL BURD

| 0.019 | 0.032 | 0.030 | 0.187 | 0.005 | 0.0235 | 0.011 | 0.0485 | 0.0342 | 0.0612 |
### TABLE 5.1. (CONTINUED)

<table>
<thead>
<tr>
<th>TAX ON:</th>
<th>INCM TAX UNSKL LAB</th>
<th>INCM TAX SKLD LAB</th>
<th>INCM TAX TOP MGMT</th>
<th>CORP INC TAX</th>
<th>PAYRL TAX</th>
<th>LUMP SUM TAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. CORRESPONDING CHANGES IN MKT PRICES - % OF INITIAL PRICES</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FOOD</td>
<td>.0000</td>
<td>-0.000</td>
<td>-0.000</td>
<td>-0.000</td>
<td>-0.001</td>
<td>-0.000</td>
</tr>
<tr>
<td>BEV. &amp; TOBUCO.</td>
<td>.0053</td>
<td>.0024</td>
<td>.0005</td>
<td>.0003</td>
<td>.0243</td>
<td>.0094</td>
</tr>
<tr>
<td>CLOTH. &amp; FWEAR.</td>
<td>-.002</td>
<td>-.001</td>
<td>-.000</td>
<td>-.001</td>
<td>-.016</td>
<td>-.005</td>
</tr>
<tr>
<td>MFG. DURABLES</td>
<td>-.003</td>
<td>-.002</td>
<td>-.001</td>
<td>-.001</td>
<td>-.028</td>
<td>-.007</td>
</tr>
<tr>
<td>HSLD. SERVICES</td>
<td>.0089</td>
<td>.0037</td>
<td>.0004</td>
<td>.0003</td>
<td>.0341</td>
<td>.0147</td>
</tr>
<tr>
<td>INVST. GOODS</td>
<td>-.001</td>
<td>.0002</td>
<td>.0005</td>
<td>.0002</td>
<td>.0067</td>
<td>.0002</td>
</tr>
<tr>
<td>OTHER GOODS</td>
<td>-.002</td>
<td>-.000</td>
<td>.0002</td>
<td>.0001</td>
<td>-.001</td>
<td>-.002</td>
</tr>
<tr>
<td>PETROLEUM</td>
<td>.0086</td>
<td>.0017</td>
<td>-.001</td>
<td>-.001</td>
<td>-.000</td>
<td>.0088</td>
</tr>
<tr>
<td>OTHER SERVICES</td>
<td>.0093</td>
<td>.0037</td>
<td>.0003</td>
<td>.0002</td>
<td>.0338</td>
<td>.0151</td>
</tr>
<tr>
<td>PRIM. COMMODITY</td>
<td>-.002</td>
<td>-.004</td>
<td>-.003</td>
<td>-.002</td>
<td>-.064</td>
<td>-.013</td>
</tr>
<tr>
<td>INFORMAL LABS.</td>
<td>-.063</td>
<td>-.048</td>
<td>-.025</td>
<td>-.013</td>
<td>-.630</td>
<td>-.171</td>
</tr>
<tr>
<td>UNSKLD. LABORS</td>
<td>-.152</td>
<td>.0642</td>
<td>.0349</td>
<td>.0205</td>
<td>.6135</td>
<td>-.995</td>
</tr>
<tr>
<td>SEMISKLD LABORS</td>
<td>.2450</td>
<td>-.050</td>
<td>.0567</td>
<td>.0328</td>
<td>.8026</td>
<td>.655</td>
</tr>
<tr>
<td>SKILLED LABORS</td>
<td>.0828</td>
<td>.0291</td>
<td>-.007</td>
<td>.0087</td>
<td>.0601</td>
<td>-.869</td>
</tr>
<tr>
<td>TOP MANAGEMENT</td>
<td>-.033</td>
<td>-.026</td>
<td>-.016</td>
<td>-.047</td>
<td>-.414</td>
<td>-.113</td>
</tr>
<tr>
<td>ENTREPRENEUR</td>
<td>-.042</td>
<td>-.031</td>
<td>-.019</td>
<td>-.010</td>
<td>-.411</td>
<td>-.122</td>
</tr>
<tr>
<td>CAPITAL SERVICE</td>
<td>.0282</td>
<td>.0077</td>
<td>-.002</td>
<td>-.001</td>
<td>.0389</td>
<td>.0352</td>
</tr>
<tr>
<td>IMPORTS</td>
<td>-.002</td>
<td>-.004</td>
<td>-.003</td>
<td>-.002</td>
<td>-.067</td>
<td>-.013</td>
</tr>
</tbody>
</table>

| B. CORRESPONDING CHANGES IN TOTAL TAX REVENUE IN % OF NAT. INC. |
| .0716                 | .0340              | .0198             | .0113             | .0204        | .3178     | .1572       |

| C. CORRESPONDING HOUSEHOLDS BURDEN IN % OF NET INCOME. |
| PUBLIC              | .3908              | .1848             | .1028             | .0578        | .1036     | 1.629       |
| INFORMAL LABORS     | -.042              | -.035             | -.019             | -.010        | -.016     | .692        |
| LOW INCOME          | -1.07              | .0594             | .0322             | .0190        | .0349     | .4924       |
| MEDIUM INCOME       | .1386              | -.542             | .0283             | .0166        | .0323     | -.051       |
| HIGH INCOME         | .0354              | .0106             | -.175             | .0007        | .0049     | .791        |
| TOP BRACKETS        | .0131              | -.000             | -.006             | -.241        | -.001     | -.877       |
| ENTREPRENEUR        | .0006              | -.014             | -.016             | -.008        | -.801     | -.143       |
| FOREIGN             | .0051              | .0007             | -.001             | -.001        | -.217     | .0044       |
| % OF NAT. INCOME    | .0008              | .0011             | .0006             | .0001        | .0004     | .0047       |
| NATIONAL BURD.      | .0030              | .0232             | .0008             | .0001        | .0004     | .0047       |

Source: Extracted from the General equilibrium model results.
5.3. ANALYSIS OF TAX REVENUE CHANGE AS A RESULT OF THE TAX INSTRUMENT CHANGE

We are interested in measuring the volume of tax revenue increase as a result of the 1% increase in each of the tax instruments.

A. METHODOLOGY OF ANALYSIS

The analysis produced an output showing the % increase in the total tax revenue for each of the tax instruments, as a result of the 1% increase in the rate respectively. The figures are shown as a percentage of national income. The percentage figures are then converted into M$ by multiplying them with a national income figure of M$ 95,737 millions.

Next, assuming that the 1% increase would increase tax revenue exactly by 1% of the tax base, we determined the figure of expected tax revenue increase by taking 1% of the tax base for each tax instrument. This is based on the benchmarks data set described in Chapter Two and Four.

To determine the tax productivity of each tax instrument, we applied a measure of actual tax revenue increase over the expected tax revenue increase, taken in percentage. We then ranked the tax instruments according to these percentage measures to determine which

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3 Received by the Treasury and subsequently, the public sector.
4 Based on the assumption of perfect response by the economy i.e. perfect marginal tax elasticity.
5 As calculated by the general equilibrium model.
6 As calculated manually by taking 1% of the tax base of each tax instrument described above.
instrument was the most productive. The higher the ratio of actual to expected tax revenue increased, the more productive the tax instrument.\(^7\)

The assumption made in the determination of expected tax revenue increase was that for each tax instrument, the tax base is constant so that each instrument would yield the full expected tax revenue increase\(^8\). Changes in the total tax revenue are important for predicting the productivity of a tax reform measure and to check whether the reform conformed to the revenue need of the Treasury. Tax revenue changes are a function of total volume of tax base and the marginal behavior of the tax agents.

\(^7\) As it shows that the tax instrument is less distorted in its effort to collect tax revenue.

\(^8\) In reality of course, the tax rate increase would alter the tax base because of the change in demand or supply depending on the price elasticities of demand or supply of the households and firms.
### TABLE 5.2.

<table>
<thead>
<tr>
<th>EXPECTED REVENUE CHANGES</th>
<th>TAX INSTRUMENTS</th>
<th>ACTUAL REVENUE CHANGES</th>
<th>ACTUAL REVENUE in $'000</th>
<th>% OF ACTUAL in $'000</th>
<th>% OF ACTUAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>M$'000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>191,738</td>
<td>Sales tax on food</td>
<td>0.1276 %</td>
<td>122,160</td>
<td>63.7</td>
<td>8</td>
</tr>
<tr>
<td>20,377</td>
<td>Sales tax on Bev.&amp; Tob.</td>
<td>0.0184 %</td>
<td>17,616</td>
<td>86.5</td>
<td>1</td>
</tr>
<tr>
<td>47,065</td>
<td>Sales tax on Cloth.&amp; Fwr.</td>
<td>0.0287 %</td>
<td>27,477</td>
<td>58.4</td>
<td>10</td>
</tr>
<tr>
<td>295,099</td>
<td>Sales tax on Mfg.Durable</td>
<td>0.1427 %</td>
<td>136,617</td>
<td>46.3</td>
<td>13</td>
</tr>
<tr>
<td>102,785</td>
<td>Service tax on Hsld.serv.</td>
<td>0.0556 %</td>
<td>53,230</td>
<td>51.8</td>
<td>12</td>
</tr>
<tr>
<td>328,555</td>
<td>Sales tax on other goods.</td>
<td>0.1418 %</td>
<td>135,755</td>
<td>41.3</td>
<td>14</td>
</tr>
<tr>
<td>120,280</td>
<td>Excise tax on Petroleum</td>
<td>0.0300 %</td>
<td>28,721</td>
<td>23.9</td>
<td>17</td>
</tr>
<tr>
<td>353,079</td>
<td>Prod.tax on Prim.comm.</td>
<td>0.2526 %</td>
<td>241,832</td>
<td>68.5</td>
<td>2</td>
</tr>
<tr>
<td>325,558</td>
<td>Export taxes on Pr.comm.</td>
<td>0.1864 %</td>
<td>178,454</td>
<td>54.8</td>
<td>11</td>
</tr>
<tr>
<td>105,909</td>
<td>Income tax - unskld.lab.</td>
<td>0.0716 %</td>
<td>68,548</td>
<td>64.7</td>
<td>6</td>
</tr>
<tr>
<td>51,407</td>
<td>Income tax - semiskld.lab</td>
<td>0.0340 %</td>
<td>32,551</td>
<td>63.3</td>
<td>9</td>
</tr>
<tr>
<td>29,378</td>
<td>Income tax - skld.lab.</td>
<td>0.0198 %</td>
<td>18,960</td>
<td>64.5</td>
<td>7</td>
</tr>
<tr>
<td>16,501</td>
<td>Income tax - top mgmt.</td>
<td>0.0113 %</td>
<td>10,818</td>
<td>65.6</td>
<td>4</td>
</tr>
<tr>
<td>30,056</td>
<td>Income tax - Entrepreneur</td>
<td>0.0204 %</td>
<td>19,530</td>
<td>65.0</td>
<td>5</td>
</tr>
<tr>
<td>460,160</td>
<td>Corporate tax</td>
<td>0.3178 %</td>
<td>304,252</td>
<td>66.1</td>
<td>3</td>
</tr>
<tr>
<td>456,072</td>
<td>Import tax</td>
<td>0.1791 %</td>
<td>171,465</td>
<td>37.6</td>
<td>15</td>
</tr>
<tr>
<td>423,360</td>
<td>Payroll tax</td>
<td>0.1572 %</td>
<td>150,499</td>
<td>35.6</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>Lumpsum tax</td>
<td>0.0147 %</td>
<td>14,073</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

Source: Extracted and manipulated from the result of G.E.analysis

### B. FINDINGS FROM THE ANALYSIS

Several observations should be noted from the analysis. First, we observed the ratio of actual to
expected and attempted to interpret them. Secondly, we analysed the ranking to compare between the tax instruments.

It is noticeable that, in some cases, such as the tax on petroleum, payroll tax, import tax, Sales tax on other goods and on manufacturing durables, the actual tax revenue increase was less than half the expected revenue. This indicates the seriousness of the direct and indirect reaction of the market\(^9\). In the case of beverage and tobacco however, tax productivity was relatively high (more than 86\%), presumably because of the inelastic nature of the tax base. Overall, the more elastic the demand and supply of goods and services, the less productive the particular tax instrument.

Income taxes were relatively productive\(^10\). Income taxes on the top management and entrepreneurs and also Corporate tax were the most productive for direct taxes. Payroll tax was the least productive in the class, notably because of the elastic nature of the demand for labour services by the firms, who pay the payroll tax bills\(^11\). Generally, the more elastic the income of the household groups, the more elastic the tax base becomes, and the tax instrument is less productive.

Based on the last column of Table 5.2, we could observe the ranking given on each of the tax instruments.

\(^9\) Both the final goods as well as the factor market (as a result of the firms and households reaction).

\(^10\) With each collecting more than 60\% of the expected tax revenue.

\(^11\) However, it must be borne in mind that this is not a real tax instrument. It is actually a force saving device for workers through their employers who contribute to the Employees provident funds on behalf of them.
Sales tax on beverage and tobacco was rated as the most productive tax instrument, whilst Payroll tax and Excise taxes are the least productive. Productivity is basically determined by the demand elasticity of the goods and services concerned. Based on the basic assumption in the model, the households income as the tax base for direct taxes were relatively more inelastic. This resulted in higher tax productivity of these taxes. Indirect taxes imposed on manufacturers who are more elastic in their supply resulted in a more elastic tax base. Tax productivity is therefore expected to be less here.

Overall, therefore, the Sales tax on the Beverage and tobacco was regarded as the most productive tax instrument in the economy, followed by the Producers tax on primary commodities, Corporate tax, and the income tax on the top management and entrepreneurs.

On the other extreme, the least productive tax instruments were the Excise tax on Petroleum, followed by Payroll tax, Import tax and the Sales taxes on other goods and manufacturing durables.

5.4. ANALYSIS OF EFFICIENCY IMPACT OF THE TAX INSTRUMENTS CHANGE

Minimisation of distortion is now regarded as a more important criterion in a tax system\textsuperscript{12}. Tax distortion criterion are normally measured negatively by expressing taxes in terms of efficiency.

\textsuperscript{12} Compared to tax revenue generation and income distribution criterion.
A. METHODOLOGY OF ANALYSIS

Similar to the tax burden analysis, efficiency is measured in terms of real income changes determined by using the compensation variation measure described earlier. A positive real income change signifies efficiency improvement\(^\text{13}\), while negative real income change signifies efficiency decline.

The general equilibrium model utilised here generated figures for real income changes of each of the household groups as well as the real national income change, as a result of the 1% increase in each of the tax instruments. We could observe the efficiency impact of the tax instruments change by observing the results presented in Table 5.4 below. We determined the net efficiency impact on the private households by adding up the real income changes of all private households as a result of the tax instruments changes\(^\text{14}\).

\(^{13}\) Or minimum distortion - actually in this case positive distortion.

\(^{14}\) i.e. informal labours, low income, medium income, high income, top brackets and entrepreneurs rows in Table 5.1, presented earlier.
B. FINDINGS FROM THE ANALYSIS

Table 5.3 shows the impact of tax instrument changes on each class of households, namely the private households, and public\textsuperscript{15}. It also shows the net national burden changes resulted from the tax instrument change.

Observations of the impact on the private households showed that, in all cases of tax instrument changes, they resulted in some welfare loss or negative real income change. The biggest impacts were created by the Corporate tax, Primary commodities tax, export tax, Sales tax on Other goods, foods and manufacturing durables. Lump sum tax was shown to have produced an exceptionally heavy burden on the private households. Income taxes on the skilled and top management groups as well as the sales tax on clothing and footwears have produced the least welfare impact on the private households groups.

\textsuperscript{15}In the case of private households, the figures were converted into M$, to allow aggregation, as the original result is provided in terms of net income of each group of households.
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>+ 22.41</td>
<td>Sales tax on food</td>
<td>-167.0</td>
<td>+182.0</td>
<td>+15.0</td>
</tr>
<tr>
<td>-57.54</td>
<td>Sales tax on Bev.&amp; Tob.</td>
<td>-31.6</td>
<td>+26.0</td>
<td>-5.6</td>
</tr>
<tr>
<td>-199.40</td>
<td>Sales tax on Cloth.&amp; Fwr.</td>
<td>-10.5</td>
<td>+42.1</td>
<td>+31.6</td>
</tr>
<tr>
<td>+103.60</td>
<td>Sales tax on Mfg.Durable</td>
<td>-150.0</td>
<td>+246.0</td>
<td>+96.0</td>
</tr>
<tr>
<td>-5.49</td>
<td>Service tax on Hsld.serv.</td>
<td>-97.4</td>
<td>+95.0</td>
<td>-2.1</td>
</tr>
<tr>
<td>-24.15</td>
<td>Sales tax on other goods</td>
<td>-302.0</td>
<td>+276.0</td>
<td>-26.0</td>
</tr>
<tr>
<td>+47.10</td>
<td>Excise tax on Petroleum</td>
<td>-63.1</td>
<td>+59.9</td>
<td>-3.2</td>
</tr>
<tr>
<td>-0.14</td>
<td>Prod.tax on Prim.comm.</td>
<td>-361.0</td>
<td>+361.0</td>
<td>0.0</td>
</tr>
<tr>
<td>-1.79</td>
<td>Export taxes on Pr.comm.</td>
<td>-267.0</td>
<td>+266.0</td>
<td>-1.0</td>
</tr>
<tr>
<td>-9.76</td>
<td>Income tax - unskld.lab.</td>
<td>-107.0</td>
<td>+104.0</td>
<td>-3.0</td>
</tr>
<tr>
<td>-18.91</td>
<td>Income tax - semiskld.lab</td>
<td>-52.0</td>
<td>+49.0</td>
<td>-3.0</td>
</tr>
<tr>
<td>-8.05</td>
<td>Income tax - skld.lab.</td>
<td>-28.2</td>
<td>+27.0</td>
<td>+25.8</td>
</tr>
<tr>
<td>-13.85</td>
<td>Income tax - top mgmt.</td>
<td>-16.0</td>
<td>+15.0</td>
<td>-1.0</td>
</tr>
<tr>
<td>-295.27</td>
<td>Income tax - Entrepreneur</td>
<td>-59.0</td>
<td>+28.0</td>
<td>-31.0</td>
</tr>
<tr>
<td>+38.88</td>
<td>Corporate tax</td>
<td>-364.0</td>
<td>+433.0</td>
<td>+69.0</td>
</tr>
<tr>
<td>+52.71</td>
<td>Import tax</td>
<td>-237.0</td>
<td>+295.0</td>
<td>+58.0</td>
</tr>
<tr>
<td>-45.78</td>
<td>Payroll tax</td>
<td>-262.0</td>
<td>+223.0</td>
<td>-39.0</td>
</tr>
<tr>
<td>-41.40</td>
<td>Lumpsum tax</td>
<td>-1,619.0</td>
<td>+1,400.0</td>
<td>-219.0</td>
</tr>
</tbody>
</table>

Source: Extracted and manipulated from the result of G.E. analysis

The observations above have only taken into account the welfare loss suffered by the economy. In all cases of tax instrument changes, the public sector experienced...
some welfare gains. This is simply because the 1% tax rate increase had increased the Treasury income and hence public sector spending. A more accurate analysis would compare the welfare loss of the private sector to the welfare gains of the public sector. The net welfare gains resulting from an instrument change means the particular tax is relatively efficient.

The last column of Table 5.3 shows the net impact of each of the tax instruments. The Lump-sum Tax, Payroll tax and income tax on entrepreneur are the worst tax instruments, each generating substantial net welfare loss to the household sectors even after taking into accounts the increase in public sector welfare\(^{16}\). Sales tax on manufacturing durables, clothing and footwear, import tax, corporate tax and income tax on the skilled labours groups were quite efficient tax instruments\(^{17}\).

Finally, the first column of Table 5.3 explores the efficiency impact of the tax instruments in terms of constant tax revenue generation\(^{18}\). This is just to affirm the initial observation based on the effect of absolute tax changes described above. Based on the uniform tax revenue assumption, taxes on clothing and footwear and manufacturing durables are the best tax instrument. Income taxes do not fair very well. Beverage and tobacco

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\(^{16}\) It roughly indicates that the extra tax revenue generated was not even enough to cover the welfare loss of the private households who suffered the extra taxes. It means that the tax is not efficient in its effort to generate extra revenue for the treasury.

\(^{17}\) and generated quite substantial welfare gains net of the private households welfare loss.

\(^{18}\) by normalising the tax change to make each tax instruments uniform in terms of its tax revenue generation capacity (this will be described in more detail in the next section).
and Payroll tax on the other hand, are among the most inferior tax instruments in the economy in terms of this efficiency criterion.

5.5. ANALYSIS OF TAX BURDEN CHANGES AS A RESULT OF TAX INSTRUMENT CHANGE.

We need to observe the tax burden distribution resulting from an imposition of a tax on a particular good or services. This is to determine the progressivity or regressivity of a particular tax instrument in terms of income distribution.

A. METHODOLOGY OF ANALYSIS

The program used in the model here produces a set of data showing the direct tax burden distribution to all household groups. Direct tax burden is shown as a percentage of individual net income in the case of households. Tax burden was determined by the compensating variation measure\(^ {19} \). A positive compensation value corresponds to a welfare gains, while a negative compensation indicates a welfare loss for the households involved. Even though what is shown here is the absolute change in the tax burden, it could assist in identifying the most sensitive tax in terms of its effect on income distribution.

Tax burden analysis would be focused on the comparison of a tax burden between taxpayers groups which would highlight the distributional impact of the tax reform. To make the analysis more meaningful, we have

\(^ {19} \) Defined as the amount of transfer necessary following the 1% increased in taxes to maintain the households utility at its initial level.
converted the real income changes of household\textsuperscript{20} into actual value expressed in M\$ millions. This will make it possible to compare the actual dollars of a tax burden between groups of taxpayers.

B. FINDING FROM THE ANALYSIS

Table 5.4 shows the tax burden distribution results of the tax rates increased in each of the tax instruments.

In all cases of tax instrument changes, the public sector experienced welfare gains\textsuperscript{21}, with the highest gains resulted from the Lump-sum Tax change. The gains from the change in Producers tax on primary commodities and Corporate tax were quite substantial as well.

The Lump sum tax, Payroll tax, Sales tax on food, beverage and tobacco, manufacturing durables, other goods and services taxes rates had increased, and had resulted in all categories of private households experiencing some welfare loss. The tax increase also resulted in a serious regressive income distribution. All these indicate the seriousness of the income distribution effect from the imposition of the tax.

\textsuperscript{20} Which was in percentage of net income.

\textsuperscript{21} Basically from the increase in the tax revenue earned by the public sector.
### TABLE 5.4.

**HOUSEHOLDS TAX BURDEN DISTRIBUTION**  
( IN M$ MILLION )

<table>
<thead>
<tr>
<th>Tax on:</th>
<th>Sale tax Food</th>
<th>Sale tax B &amp; T</th>
<th>Sale tax C &amp; F</th>
<th>Sale tax M.Dur</th>
<th>Serv. tax H.ser</th>
<th>Sale tax O.gds</th>
<th>Excise tax Petr.</th>
<th>Prod. tax P.com</th>
<th>Exp. tax P.cm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public</td>
<td>+182</td>
<td>+26.0</td>
<td>+42.1</td>
<td>+246.0</td>
<td>+95.3</td>
<td>+276.0</td>
<td>+59.9</td>
<td>+361.0</td>
<td>+266.0</td>
</tr>
<tr>
<td>Informal la</td>
<td>-83.6</td>
<td>-12.9</td>
<td>-5.9</td>
<td>-40.3</td>
<td>-32.5</td>
<td>-88.4</td>
<td>+17.0</td>
<td>-299.0</td>
<td>-220.0</td>
</tr>
<tr>
<td>Low income</td>
<td>-16.8</td>
<td>-4.7</td>
<td>-0.4</td>
<td>-17.4</td>
<td>-3.4</td>
<td>-14.0</td>
<td>+2.3</td>
<td>+47.4</td>
<td>+61.0</td>
</tr>
<tr>
<td>Medium inc.</td>
<td>-6.6</td>
<td>-2.6</td>
<td>+1.9</td>
<td>-1.8</td>
<td>-3.0</td>
<td>-9.8</td>
<td>-6.9</td>
<td>+19.2</td>
<td>+18.0</td>
</tr>
<tr>
<td>High income</td>
<td>-23.9</td>
<td>-5.1</td>
<td>-0.8</td>
<td>-22.6</td>
<td>-21.5</td>
<td>-64.5</td>
<td>-31.9</td>
<td>-47.8</td>
<td>-51.0</td>
</tr>
<tr>
<td>Top bracket</td>
<td>-13.8</td>
<td>-2.7</td>
<td>-1.2</td>
<td>-16.0</td>
<td>-11.5</td>
<td>-34.8</td>
<td>-15.0</td>
<td>-26.7</td>
<td>-26.0</td>
</tr>
<tr>
<td>Entrepreneur</td>
<td>-22.3</td>
<td>-3.6</td>
<td>-4.1</td>
<td>-52.0</td>
<td>-25.5</td>
<td>-90.0</td>
<td>-28.6</td>
<td>-54.3</td>
<td>-49.0</td>
</tr>
<tr>
<td>Foreign</td>
<td>-26.9</td>
<td>0.5</td>
<td>-37.9</td>
<td>-148.0</td>
<td>-8.8</td>
<td>-51.3</td>
<td>-83.5</td>
<td>-1.8</td>
<td>-68.0</td>
</tr>
<tr>
<td>Total prvt tax burden</td>
<td>-167.0</td>
<td>-31.6</td>
<td>-10.5</td>
<td>-150.0</td>
<td>-97.4</td>
<td>-302.0</td>
<td>-63.1</td>
<td>-361.0</td>
<td>-267.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Public</td>
<td>+104</td>
<td>+49.0</td>
<td>+27.0</td>
<td>+15.0</td>
<td>+28.0</td>
<td>+433.0</td>
<td>+295.0</td>
<td>+223.0</td>
</tr>
<tr>
<td>Informal la</td>
<td>-6.4</td>
<td>-5.3</td>
<td>-3.0</td>
<td>-1.5</td>
<td>-2.5</td>
<td>-106.0</td>
<td>-129.0</td>
<td>-19.0</td>
</tr>
<tr>
<td>Low income</td>
<td>-122</td>
<td>+6.8</td>
<td>+3.7</td>
<td>+2.2</td>
<td>+4.0</td>
<td>+56.0</td>
<td>+20.0</td>
<td>-105.0</td>
</tr>
<tr>
<td>Medium inc.</td>
<td>+14.0</td>
<td>-54.0</td>
<td>+2.8</td>
<td>+1.6</td>
<td>+3.2</td>
<td>-5.1</td>
<td>+6.4</td>
<td>-32.0</td>
</tr>
<tr>
<td>High income</td>
<td>+6.1</td>
<td>+1.8</td>
<td>-30.0</td>
<td>+0.1</td>
<td>+0.8</td>
<td>-135.0</td>
<td>-47.0</td>
<td>-21.0</td>
</tr>
<tr>
<td>Top bracket</td>
<td>+1.0</td>
<td>-0.3</td>
<td>-43.0</td>
<td>-18.0</td>
<td>-0.9</td>
<td>-65.0</td>
<td>-26.0</td>
<td>-18.0</td>
</tr>
<tr>
<td>Entrepreneur</td>
<td>+0.05</td>
<td>-1.1</td>
<td>-1.3</td>
<td>-64.0</td>
<td>-64.0</td>
<td>-114.0</td>
<td>-61.0</td>
<td>-67.0</td>
</tr>
<tr>
<td>Foreign</td>
<td>+2.9</td>
<td>+40.0</td>
<td>-63.0</td>
<td>-28.0</td>
<td>+0.6</td>
<td>-123.0</td>
<td>-14.0</td>
<td>+2.5</td>
</tr>
<tr>
<td>Total prvt tax burden</td>
<td>-107.0</td>
<td>-52.0</td>
<td>-28.0</td>
<td>-16.0</td>
<td>-59.0</td>
<td>-364.0</td>
<td>-237.0</td>
<td>-262.0</td>
</tr>
</tbody>
</table>

Source: Extracted and manipulated from the result of General Equilibrium model analysis.
In the case of income taxes, the low income, medium income and the high income groups each experienced some overall welfare gains each. The distributional impact of income tax on unskilled labours were different from the rest of income tax impacts. This is because the informal and unskilled labours experienced substantial welfare losses while the other groups experienced welfare gains. In the case of skilled labour tax, the high income taxpayers experienced substantial welfare losses, while the low and medium income groups experienced welfare gains. The same applied to the income taxes for the top management and entrepreneurs groups. Producers tax, export tax on primary commodities, import taxes and corporate tax had caused the informal labours group to experience some substantial welfare losses compared with the other households groups.

From these observations, it could be concluded that each tax instrument 'attacked' taxpayers groups differently, except for the income taxes which resulted in almost the same distributional impact. The low income and the medium income groups were the two privileged groups, especially under income taxes, as they experienced significant welfare gains in most cases. Informal labours, top management and entrepreneurs were the worst affected by the majority of tax instruments.

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22 Indicating some regressive effect of the instruments.

23 This reflected a more progressive distribution result.

24 This would result in regressive distribution impacts, especially if we used a Rawlsian basis of equity.

25 reflecting the certainty of the progressive distribution impact.

26 With a heavy tax burden experienced except in the case of Sales tax on clothing and footwear and Income tax on the unskilled labour group.
The overall impact on the tax burden distribution was most regressive in the case of Producers tax, export tax and import taxes and least regressive in the case of Corporate tax, excise tax on petroleum and income tax on semi-skilled labours group.

Comparing this result with the distribution of the tax burden in 1973 (described earlier), we could make some interesting points. In all cases of Sales tax, the burden distribution does not change much. The informal labour groups were still the worst affected by all these taxes. The impact of taxes on primary commodities looked much worse in 1988 than in 1973. The significant difference, perhaps, was the impact of tax instrument changes on the low income and the medium income groups. Our results showed that these groups had experienced some substantial welfare gains as a result of primary commodities taxes compared to their welfare position in 1973. This at least showed some improvement in the distributional impact. The same comment applies to import taxes.

On direct taxes however, except for the impact on payroll taxes, impact of tax instruments changes were quite different. Under the current tax instrument changes, the two classes of taxpayers namely the medium and high income groups experienced a substantial welfare gain compared to the heavy tax burden they suffered in 1973. The current payroll tax changes impact was, however, almost, identical in 1973.

The difference in the tax distribution result here could have been caused by the different assumptions made in the earlier study. It did not take into account the
tax effect on public sector expenditures\textsuperscript{27}, which influenced the final tax burden distribution.

A more thorough analysis, quantitatively measuring the impact of tax change on income distribution using the Atkinson's inequality aversion index, will be attempted in the normalised changes analysis discussed next.

\textbf{5.6. ANALYSIS OF THE IMPACT OF NORMALISED CHANGES IN THE TAX INSTRUMENTS}

In order to make an appropriate comparison between tax instruments and to enable analysis of each of the tax instruments being made, we normalised all tax instruments\textsuperscript{28}. As a result, the impact of tax changes on each of the tax instrument was expressed in relation to a common value namely "the value that is sufficient to compensate the utility loss of the public sector" caused by the tax rates increase.

Normalisation means that the volume of public consumption (measured by compensating variation) increased by 1\% in all cases. The result is then manipulated by using the 1\% public burden as the benchmark. The net effect of this normalisation actually took back the element of taxes on the public sector, leaving it free from experiencing any tax changes subjected to the economy\textsuperscript{29}.

\textsuperscript{27} Which had been shown by our model to have caused a significant impact on the households' real income, because a large proportion of labour services are being utilised by the public sector.

\textsuperscript{28} by requiring each tax change to provide enough tax revenue in order to compensate the losses in the public sector utility as the result of each tax rate increased.

\textsuperscript{29} which means compensating them from the actual tax that had been imposed on them.
Table 5.5 shows the tax rate changes necessary to fully compensate the public burden experienced by the public sector as a result of tax changes. At these rates, the public sector real income changes would be "+1", i.e. exactly correlated to the initial 1% tax rates increase. As the tax base and tax elasticity of each tax instrument was different, we observed that tax rates needed to achieve normalisation were also different for each of the tax instruments. The smaller the tax rates required to achieve normalisation, the more productive the tax. Lump-sum Tax is the productive tax in the economy\(^{30}\). Corporate taxes, Producers tax on primary commodities and import taxes were amongst the more productive taxes in the economy. Income taxes were amongst the least productive taxes in the economy with the tax on top management groups being the worst\(^{31}\). Sales taxes on beverage and tobacco, clothing and footwear and also Excise tax on petroleum were relatively less productive in the economy.

A. OBSERVATION OF THE NET PRICES CHANGES UNDER NORMALISED ASSUMPTION.

Table 5.6 repeats the format of Table 5.1 showing impacts on market prices, tax revenue and households' tax burden changes but showing these figures after normalization of each of the tax instrument changes.

\(^{30}\) simply because the Lump-sum Tax changes was at 1% of the national income rather than 1% of the tax base as in other cases.

\(^{31}\) This is because the tax base for these taxes was relatively small.
## TABLE 5.5.

<table>
<thead>
<tr>
<th>CHANGES IN THE TAX INSTRUMENT NEEDED FOR NORMALISATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>( in percentage )</td>
</tr>
<tr>
<td>Sales tax on food</td>
</tr>
<tr>
<td>Sales tax on bev.&amp; tob.</td>
</tr>
<tr>
<td>Sales tax on Clot.&amp; Fwr.</td>
</tr>
<tr>
<td>Sales tax on mfg. Durable</td>
</tr>
<tr>
<td>Service tax on Hsld. serv.</td>
</tr>
<tr>
<td>Sales tax on other goods</td>
</tr>
<tr>
<td>Excise tax - Petroleum product</td>
</tr>
<tr>
<td>Producers tax - Prim. commdt.</td>
</tr>
<tr>
<td>Export taxes - Pr. comm. and Petr.</td>
</tr>
<tr>
<td>Income tax - Unskilled labour</td>
</tr>
<tr>
<td>Income tax - Semiskilled labour</td>
</tr>
<tr>
<td>Income tax - Skilled labour</td>
</tr>
<tr>
<td>Income tax - Top mgmt.</td>
</tr>
<tr>
<td>Income tax - Entrpr.</td>
</tr>
<tr>
<td>Corporate tax</td>
</tr>
<tr>
<td>Import tax</td>
</tr>
<tr>
<td>Payroll tax</td>
</tr>
<tr>
<td>Lumpsum tax</td>
</tr>
</tbody>
</table>

Source: Extracted from the G.E. analysis results.
TABLE 5.6.

EFFECT OF NORMALISED CHANGES IN THE TAX INSTRUMENTS

<table>
<thead>
<tr>
<th>TAX ON:</th>
<th>SALE TAX FOOD</th>
<th>SALE TAX B&amp;B</th>
<th>SALE TAX C&amp;FW</th>
<th>SALE TAX M.DR</th>
<th>SALE TAX H.SR</th>
<th>SALE TAX O.GD</th>
<th>PROD TAX P.CM</th>
<th>ESCS TAX PETR</th>
<th>EXPT TAX P.CM</th>
<th>IMPT TAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. CHANGES IN TAX INSTR. IN % FOR 1% CHANGE IN PUBLIC CONSMPT.</td>
<td>1.46</td>
<td>10.2</td>
<td>6.31</td>
<td>1.08</td>
<td>2.79</td>
<td>.961</td>
<td>.736</td>
<td>4.44</td>
<td>.998</td>
<td>.901</td>
</tr>
</tbody>
</table>

| B. CORRESPONDING CHANGES IN MKT. PRICES - % OF INITIAL PRICES |
|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|-----------|
| FOOD | 1.40 | -.02 | -.04 | -.29 | -.20 | -.42 | .009 | -.20 | -.16 | -.14 |
| BEV. & TOBacco | .055 | 10.2 | -.03 | -.28 | -.20 | -.41 | -.14 | -.42 | -.24 | -.20 |
| CLOTH. & FWR. | -.04 | -.03 | 6.26 | -.30 | -.17 | -.43 | .090 | -.11 | .152 | .138 |
| MFG. DURABLES | -.06 | -.04 | -.03 | .778 | -.23 | -.43 | .145 | -.15 | .268 | .244 |
| MSLD. SERVICE | .048 | .063 | .056 | -.25 | 2.48 | -.44 | -.20 | .083 | -.32 | -.26 |
| INVS. GOODS | -.03 | -.02 | -.03 | -.26 | -.11 | .250 | -.03 | .011 | -.05 | -.05 |
| OTHER GOODS | -.04 | -.02 | -.03 | -.28 | -.14 | .490 | .014 | -.14 | .009 | .002 |
| PETROLEUM | -.03 | -.01 | -.03 | -.26 | -.25 | -.24 | -.03 | 3.97 | -.14 | -.10 |
| OTHER SERVICE | -.01 | .014 | .005 | -.20 | -.01 | -.44 | -.21 | -.43 | -.30 | -.27 |
| PRIM. COMM. DR. | -.09 | -.06 | -.06 | -.29 | -.26 | -.46 | .363 | -.11 | -.43 | -.39 |
| INFORMAL LABS | -.46 | -.41 | -.30 | -.53 | -.78 | -.84 | -.19 | .826 | -1.9 | -1.0 |
| UNSKL. LABORS | .129 | .140 | .005 | -.30 | -.12 | -.31 | .320 | .040 | .490 | .091 |
| SEMISKL. LABS | .365 | .383 | .260 | -.06 | .084 | -.08 | .490 | .129 | .606 | .276 |
| SKILLED LABOR | .021 | .067 | -.11 | -.41 | -.32 | -.51 | .060 | -.34 | .140 | -.14 |
| TOP MGMT. | -.28 | -.23 | -.41 | -.72 | -.62 | -.81 | -.23 | -.63 | -.15 | -.44 |
| OWNER ENTRPR. | -.28 | -.21 | -.45 | -.78 | -.65 | -.86 | -.25 | -.64 | -.16 | -.47 |
| CAPITAL SERV. | .001 | .031 | .013 | -.22 | -.38 | -.55 | -.30 | -.11 | -.52 | -.38 |
| IMPORTS | -.08 | -.05 | -.06 | -.29 | -.26 | -.46 | .338 | -.07 | .540 | .40 |

C. CORRESPONDING CHANGES IN TOTAL TAX REVENUE IN % OF NAT. INC.
| .186 | .188 | .181 | .154 | .155 | .136 | .186 | .133 | .186 | .161 |

D. CORRESPONDING CHANGES IN HOUSEHOLDS BURDEN IN % OF NET INCOME

| PUBLIC | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| INFORMAL LABS | -.79 | -.86 | -.24 | -.28 | -.59 | -.55 | -.14 | .491 | -1.4 | -.75 |
| LOW INCOME | -.21 | -.42 | -.02 | -.16 | -.08 | -.12 | .305 | .088 | .529 | .156 |
| MEDIUM INCOME | -.10 | -.27 | .121 | -.02 | -.08 | -.10 | .143 | -.31 | .176 | .058 |
| HIGH INCOME | -.20 | -.31 | -.03 | -.14 | -.35 | -.36 | -.21 | -.83 | -.30 | -.25 |
| TOP BRACKETS | -.27 | -.37 | -.10 | -.23 | -.43 | -.45 | -.26 | -.89 | -.35 | -.31 |
| ENTREPRENEUR | -.41 | -.46 | -.33 | -.71 | -.90 | -.11 | -.50 | -.16 | -.62 | -.70 |
| FOREIGN | -.07 | -.01 | -.42 | -.28 | -.04 | -.09 | -.00 | -.65 | -.12 | -.28 |

| % OF NAT. INC. | .0027 | .0324 | .0191 | .0201 | .0015 | .0226 | .0082 | .2150 | .0341 | .0551 |

NATIONAL HURD.
<table>
<thead>
<tr>
<th></th>
<th>INC.T</th>
<th>INC.T</th>
<th>INC.T</th>
<th>INC.T</th>
<th>INC.T</th>
<th>CORP.</th>
<th>INC.T</th>
<th>PAYR.</th>
<th>LUMP SUM TAX</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TABLE 5.6.</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CONTINUED</td>
</tr>
</tbody>
</table>

**A. CHANGE IN TAX INSTR. IN % FOR 1% CHANGE IN THE PUBLIC CONSUMPTION**  
\[ \text{1.191 } \frac{\%}{\text{TOTAL TAX}} \]

**B. CORRESPONDING CHANGES IN MARKET PRICES - % OF INITIAL PRICES**

<table>
<thead>
<tr>
<th>Department</th>
<th>Change</th>
<th>Change</th>
<th>Change</th>
<th>Change</th>
<th>Change</th>
<th>Change</th>
<th>Change</th>
<th>Change</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food</td>
<td>0.001</td>
<td>-0.00</td>
<td>-0.00</td>
<td>-0.00</td>
<td>-0.00</td>
<td>-0.00</td>
<td>-0.00</td>
<td>-0.00</td>
<td>-0.00</td>
</tr>
<tr>
<td>Beverages &amp; Tobacco</td>
<td>0.0135</td>
<td>0.0129</td>
<td>0.0044</td>
<td>0.0045</td>
<td>0.0096</td>
<td>0.0149</td>
<td>0.0111</td>
<td>0.0169</td>
<td></td>
</tr>
<tr>
<td>Clothing &amp; F. Wear.</td>
<td>-0.006</td>
<td>-0.007</td>
<td>-0.05</td>
<td>-0.05</td>
<td>-0.06</td>
<td>-0.01</td>
<td>-0.006</td>
<td>-0.010</td>
<td></td>
</tr>
<tr>
<td>Manufacturable</td>
<td>-0.007</td>
<td>-0.011</td>
<td>-0.01</td>
<td>-0.009</td>
<td>-0.009</td>
<td>-0.017</td>
<td>-0.008</td>
<td>-0.015</td>
<td></td>
</tr>
<tr>
<td>Services</td>
<td>0.0229</td>
<td>0.0198</td>
<td>0.0038</td>
<td>0.0044</td>
<td>0.0143</td>
<td>0.0209</td>
<td>0.0175</td>
<td>0.0257</td>
<td></td>
</tr>
<tr>
<td>Invest. Goods</td>
<td>-0.002</td>
<td>0.0011</td>
<td>0.0048</td>
<td>0.0040</td>
<td>0.0014</td>
<td>0.0041</td>
<td>0.0002</td>
<td>0.0019</td>
<td></td>
</tr>
<tr>
<td>Other Goods</td>
<td>-0.005</td>
<td>-0.002</td>
<td>0.0022</td>
<td>0.0016</td>
<td>-0.001</td>
<td>-0.001</td>
<td>-0.003</td>
<td>-0.003</td>
<td></td>
</tr>
<tr>
<td>Petroleum</td>
<td>0.0221</td>
<td>0.0091</td>
<td>-0.014</td>
<td>-0.010</td>
<td>0.0046</td>
<td>-0.000</td>
<td>0.0105</td>
<td>0.0100</td>
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</tr>
<tr>
<td>Other Services</td>
<td>0.0239</td>
<td>0.0201</td>
<td>0.0031</td>
<td>0.0039</td>
<td>0.0144</td>
<td>0.0207</td>
<td>0.0180</td>
<td>0.0261</td>
<td></td>
</tr>
<tr>
<td>Prim. Commodity</td>
<td>-0.006</td>
<td>-0.022</td>
<td>-0.032</td>
<td>-0.028</td>
<td>-0.020</td>
<td>-0.039</td>
<td>-0.016</td>
<td>-0.034</td>
<td></td>
</tr>
<tr>
<td>Informal Labs.</td>
<td>-0.161</td>
<td>-0.261</td>
<td>-0.245</td>
<td>-0.218</td>
<td>-0.216</td>
<td>-0.387</td>
<td>-0.204</td>
<td>-0.373</td>
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<tr>
<td>Unskilled Labs.</td>
<td>-0.389</td>
<td>0.3457</td>
<td>-0.3395</td>
<td>0.3550</td>
<td>0.3644</td>
<td>0.3765</td>
<td>-0.118</td>
<td>0.3058</td>
<td></td>
</tr>
<tr>
<td>Semiskilled Labs.</td>
<td>-0.6270</td>
<td>-0.269</td>
<td>-0.5518</td>
<td>0.5665</td>
<td>0.5812</td>
<td>0.4926</td>
<td>-0.780</td>
<td>0.4472</td>
<td></td>
</tr>
<tr>
<td>Skilled Labs.</td>
<td>0.2120</td>
<td>0.1576</td>
<td>-0.072</td>
<td>-0.1503</td>
<td>0.1672</td>
<td>0.0369</td>
<td>-0.104</td>
<td>0.0681</td>
<td></td>
</tr>
<tr>
<td>Top Management</td>
<td>-0.084</td>
<td>-0.139</td>
<td>-0.159</td>
<td>-0.809</td>
<td>-0.129</td>
<td>-0.254</td>
<td>-0.135</td>
<td>-0.232</td>
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<tr>
<td>Entrepreneur</td>
<td>-0.108</td>
<td>-0.165</td>
<td>-0.184</td>
<td>-0.170</td>
<td>-0.115</td>
<td>-0.252</td>
<td>-0.145</td>
<td>-0.262</td>
<td></td>
</tr>
<tr>
<td>Capital Service</td>
<td>0.0721</td>
<td>0.0417</td>
<td>-0.024</td>
<td>-0.016</td>
<td>0.0260</td>
<td>0.0239</td>
<td>0.0419</td>
<td>0.0505</td>
<td></td>
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<tr>
<td>Imports</td>
<td>-0.005</td>
<td>-0.022</td>
<td>-0.031</td>
<td>-0.027</td>
<td>-0.020</td>
<td>-0.041</td>
<td>-0.015</td>
<td>-0.032</td>
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</tr>
</tbody>
</table>

**C. CORRESPONDING CHANGES IN TOTAL TAX REVENUE IN % OF NAT. INC.**

<table>
<thead>
<tr>
<th>Department</th>
<th>Change</th>
<th>Change</th>
<th>Change</th>
<th>Change</th>
<th>Change</th>
<th>Change</th>
<th>Change</th>
<th>Change</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
</tr>
<tr>
<td>Informal Labs.</td>
<td>-0.107</td>
<td>-0.188</td>
<td>-0.188</td>
<td>-0.166</td>
<td>-0.157</td>
<td>-0.425</td>
<td>-0.145</td>
<td>-0.668</td>
<td></td>
</tr>
<tr>
<td>Low Income</td>
<td>-2.73</td>
<td>0.3214</td>
<td>0.3132</td>
<td>0.3278</td>
<td>0.3371</td>
<td>0.3022</td>
<td>-0.110</td>
<td>-0.196</td>
<td></td>
</tr>
<tr>
<td>Medium Income</td>
<td>0.3547</td>
<td>-0.293</td>
<td>-0.2755</td>
<td>-0.2863</td>
<td>-0.3115</td>
<td>-0.032</td>
<td>-0.388</td>
<td>-0.157</td>
<td></td>
</tr>
<tr>
<td>High Income</td>
<td>0.0906</td>
<td>0.0576</td>
<td>-0.170</td>
<td>0.0125</td>
<td>0.0476</td>
<td>-0.486</td>
<td>-0.147</td>
<td>-0.360</td>
<td></td>
</tr>
<tr>
<td>Top Brackets</td>
<td>0.0335</td>
<td>0.002</td>
<td>-0.055</td>
<td>-0.417</td>
<td>-0.011</td>
<td>-0.538</td>
<td>-0.280</td>
<td>-0.441</td>
<td></td>
</tr>
<tr>
<td>Entrepreneur</td>
<td>0.0016</td>
<td>-0.074</td>
<td>-0.160</td>
<td>-0.141</td>
<td>-0.74</td>
<td>-0.880</td>
<td>-0.999</td>
<td>-0.908</td>
<td></td>
</tr>
<tr>
<td>Foreign</td>
<td>0.0131</td>
<td>0.0036</td>
<td>-0.011</td>
<td>-0.008</td>
<td>0.0013</td>
<td>-0.133</td>
<td>0.0052</td>
<td>0.0042</td>
<td></td>
</tr>
<tr>
<td>% of Nat. Inc.</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>National Burden</td>
<td>0.020</td>
<td>0.061</td>
<td>0.059</td>
<td>0.019</td>
<td>0.035</td>
<td>0.029</td>
<td>0.035</td>
<td>0.044</td>
<td></td>
</tr>
</tbody>
</table>

Source: Extracted from the SE analysis results.
Notice that the trend shown is almost identical to that in Table 5.1. The set of figures in Table 5.6 is actually the same set of figures as in Table 5.1 but was inflated by the rate of change in the tax instrument needed for normalisation. The figures would therefore look highly inflated in some cases\(^{32}\) because of the higher increased tax rates required to achieve normalisation of the public sector.

Analysis based on the normalised changes would be more meaningful, especially when we attempt to compare performances between tax instruments. We would therefore be more interested in employing this set of figures in our subsequent analysis, especially in evaluating tax reform proposals. To avoid duplication in effort, the tax shifting and incidence studies on these normalised figures was omitted.

A. TAX SHIFTING AND INCIDENCE ANALYSIS

Table 5.6 presents the results of increasing the tax rates by a rate that normalised the tax increased so as to compensate the public sectors' welfare losses. To make the observation meaningful, we will use the Lump-Sum Tax as the standard of yardstick. We therefore compare the incidence phenomenon, in terms of net effect of the Lump-Sum tax changes.

The observations here will be related to basic assumptions made in the model and the price elasticities

\(^{32}\) especially the Sales taxes on beverage and tobacco, clothing and footwear, excise tax on petroleum products, income taxes on semi-skilled, skilled, top management and entrepreneurial groups.
of supply and demand. The perfect competition assumption would imply that, in the medium term, household's demand will be inelastic and there will be some significant forward shifting occurring in the market. The constant return to scale assumption, which leads to constant cost or constant long run average costs, will mean that supply of factor input will be elastic. Indeed, we strengthened this result by explicitly delineating the perfect mobility assumption for factor labours and capital supply. This means that there will be very little backward shifting expected on the factors market. Most tax shifting would therefore be expected to occur in the final goods market.

Most crucial to the observation is the significant influence of public expenditure increase on the change in the demand and prices of goods and services in the economy. In most cases, including the labour market, increased tax revenue caused public expenditure to also increase. Hence, demand and prices of goods and services significantly consumed by the public sector rose significantly. This influenced the indirect incidence of the taxes.

Indirect taxes here are imposed on the producers or firms sectors. A forward shifting means taxes will be passed to the consumers. This is reflected in the price of final goods. A backward shifting means taxes will be passed to the factor input's suppliers and reflected in the input factor's prices.

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33 As determined by the model using income elasticities, substitution elasticities and cost shares of the firms.
Incidence of taxes could be traced back to the price elasticities in the case of households and factor intensities in the case of the firms. Below are the factor intensities of the firms presented for reference purposes.

| TABLE 5.7. |
| FACTOR INTENSITIES OF THE FIRMS (in percentage) |

<table>
<thead>
<tr>
<th></th>
<th>Inf work</th>
<th>Unsk lab</th>
<th>Semi skld</th>
<th>Skld lab</th>
<th>Top mgmt</th>
<th>Own ent</th>
<th>Cap serv</th>
<th>Import</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food</td>
<td>7.75</td>
<td>10.62</td>
<td>4.77</td>
<td>3.69</td>
<td>2.88</td>
<td>4.31</td>
<td>33.58</td>
<td>32.40</td>
</tr>
<tr>
<td>Bev&amp;Tob</td>
<td>7.03</td>
<td>9.63</td>
<td>4.32</td>
<td>3.35</td>
<td>2.62</td>
<td>3.91</td>
<td>53.76</td>
<td>15.38</td>
</tr>
<tr>
<td>Clot&amp;Fw</td>
<td>5.07</td>
<td>6.95</td>
<td>3.12</td>
<td>2.41</td>
<td>1.89</td>
<td>2.82</td>
<td>12.79</td>
<td>64.96</td>
</tr>
<tr>
<td>MfgDura</td>
<td>3.77</td>
<td>5.17</td>
<td>2.32</td>
<td>1.79</td>
<td>1.40</td>
<td>2.10</td>
<td>9.75</td>
<td>73.68</td>
</tr>
<tr>
<td>Hsldserv</td>
<td>7.07</td>
<td>9.70</td>
<td>4.35</td>
<td>3.37</td>
<td>2.63</td>
<td>3.93</td>
<td>68.94</td>
<td>0.00</td>
</tr>
<tr>
<td>Invstgd</td>
<td>13.14</td>
<td>18.01</td>
<td>8.08</td>
<td>6.26</td>
<td>4.90</td>
<td>7.31</td>
<td>42.33</td>
<td>0.00</td>
</tr>
<tr>
<td>Othgoods</td>
<td>7.28</td>
<td>9.98</td>
<td>4.72</td>
<td>3.47</td>
<td>2.71</td>
<td>4.05</td>
<td>11.35</td>
<td>56.68</td>
</tr>
<tr>
<td>Petroleum</td>
<td>1.41</td>
<td>1.94</td>
<td>0.87</td>
<td>0.67</td>
<td>0.53</td>
<td>0.79</td>
<td>61.30</td>
<td>32.48</td>
</tr>
<tr>
<td>Oth.serv.</td>
<td>6.18</td>
<td>8.47</td>
<td>3.80</td>
<td>2.94</td>
<td>2.30</td>
<td>3.43</td>
<td>68.53</td>
<td>4.33</td>
</tr>
<tr>
<td>Prim.comm</td>
<td>23.57</td>
<td>6.35</td>
<td>2.85</td>
<td>2.21</td>
<td>1.72</td>
<td>2.58</td>
<td>43.10</td>
<td>17.62</td>
</tr>
</tbody>
</table>

Source: Calculated from the benchmark equilibrium data set.

On the whole, the larger the proportion of a particular input in the factor intensities of a product, the higher the degree of backward shifting that would occur into the factor market. This, however, also depends heavily on the supply elasticity of the firms. The less elastic they are, the more likely tax will be shifted backward.
All changes in the market price of foreign goods, except the effect on import tax, equals changes in the net prices of foreign goods, with prices measured in Malaysian currency. With the assumption that world prices for foreign goods are fixed, changes in the net price for foreign goods experienced by the foreign sector equals the change in the foreign exchange rate. Capital service costs reflect the profitability ratio of the firms sector\textsuperscript{34}.

We will evaluate the incidence phenomenon on some specific tax instruments that will be evaluated further in the tax reform analysis that follows. To start with, let's observe the price impact of Lump-Sum tax. The instrument's impact on market prices of firms products were relatively mild, especially on the price of food items. Cases of prices declined were more serious than prices increased. This price declined could be explained by overall dropped in the demand for goods and services, and the subsequent dropped in the supply of these goods. Investment goods had however increased in demand and supply due to the increased in the public consumption, as tax revenue collection increased.

The Lump-Sum tax had also caused wages rates to rise quite substantially, except for the informal labours, top management and entrepreneurs which also dropped in the demand. Demand for the unskilled, semi-skilled and skilled labour services had increased as a result of the public sector expenditure increased.

\textsuperscript{34} Changes in the capital service price as a result of the tax rate increase would reflect the impact of the change on the profitability ratio of the firm.
Capital services or profitability rate of the firm rose mildly, reflecting some positive impact of the tax rate increased on the firms sector. This was caused by the substantial increased in the demand for capital services. Import prices had declined and the foreign exchange rate dropped in relation to Malaysian dollars, even though import volume rose marginally.

I. INCIDENCE OF THE SALES TAX ON FOOD ITEMS

Foodstuffs are the most inelastic goods in the economy. It is however relatively more elastic to the higher income group. At a substitution elasticity of 0.5, food demand is relatively inelastic. Production of food is quite substantial, amounting to 9% of trade volume in the economy but the current effective tax rate is very low comparatively (0.767%). The Sales tax on food imposed on manufacturers thus has been more than fully forward shifted into the market. Prices have gone up by more than 1.4%. Prices of other goods and services had however declined quite mildly (less than 0.1% each) compared to the impact of the Lump-Sum tax. Overall some backward shifting of tax has occurred, even though the rate is very minimal. The tax rate increase has thus caused the demand for food to reduce quite substantially.

The wage rate has declined as a result of the tax rate increase (particularly for informal labour, top management and entreprenuers). The rest of the labour groups nevertheless experienced some wage rate increase. The profitability rate of the firms rose marginally, even though demand for capital services had dropped in relation to the changes in the Lump-Sum tax. The tax on food has also lowered the foreign exchange rate and increased import prices marginally.
II. INCIDENCE OF THE SALES TAX ON BEVERAGE AND TOBACCO

This is another set of inelastic goods, though the demand is rather inelastic as income became higher. The low elasticity of substitution also contributes to the overall inelastic demand for beverage and tobacco in the market. The tax base is very small, accounting only to about 1% of the trade volume in the economy, even though the effective tax rate is extremely high at 55%.

The tax imposed on the producers who faced a relatively inelastic demand has enabled producers to shift tax into the market excessively (more than 10% compared to the small increase in the tax rate). Prices of other goods and services have however dropped marginally, just as in the case of Sales tax on food. The tax rate increase has caused the output of the beverage and tobacco industry to decline substantially.

The impact on value added prices, namely labour and capital services were similar to that in the case of the food tax, except milder. The decline in the profitability rates were caused by the substantial decline in the demand for beverage and tobacco (more than 3%). The foreign exchange rate however had declined marginally, caused by the decline in the demand for imported goods.

III. INCIDENCE OF THE SALES TAX ON CLOTHING AND FOOTWEARS

The demand for clothing and footwear is relatively elastic for most household groups and especially the middle income group, with a relatively moderate elasticity of substitution. The tax base is quite small, with a relatively small effective tax rate (3.399%).
The tax rate increase has caused prices of clothing and footwear to rise by about 6%, again indicating an extremely excessive forward shifting of tax into the market. Prices of other goods and services had on the other hand dropped marginally indicating some phenomenon of backward shifting of tax.

Wages rates of most labour groups had dropped marginally compared to the impact of the Lump-Sum tax, except for the informal labour group, who experienced a small wages increase. Capital services had also fallen marginally, reflecting the mild backward shifting of tax again. Further, imports increased quite substantially as a result of the tax rate increase.

IV. INCIDENCE OF THE MANUFACTURING SALES TAX ON MANUFACTURING DURABLES

Manufacturing durables are regarded as the most elastic goods in the market. They have a large tax base and a relatively high effective tax rate, which has contributed a large part of government tax revenue.

The tax rate increase has caused the price of manufacturing durables to rise by 0.76%. This is relatively quite mild in relation to the effect of the Lump-Sum tax. Prices of other goods and services fell marginally as a result of the manufacturing durables tax indicating some backward shifting of taxes. Output of the manufacturing industries sector dropped by more than 2.4%.

Wages rates of labour groups dropped by about 0.4%. The impact was quite severe compared to that of the three tax instruments described earlier. The capital services
rate also fell marginally, even though the rate was higher than in the case of the three earlier instruments. The foreign exchange rate dropped quite substantially as a result of the tax rate increase, while imports increased by about 1%.

V. INCIDENCE OF THE SALES TAX ON OTHER GOODS

The Other Goods category actually comprised of diverse groups of goods ranging from furniture and fixtures to metal and rubber products. It is estimated that most of these goods are consumed as inputs to firms. These goods are relatively elastic in the market and had the largest tax base compared to the other tax instruments.

The tax rate increase caused prices of other goods to increase by about 0.5%, compared to the effect of a similar change in the Lump-Sum tax. Demand, on the other hand, dropped marginally. The other goods tax had caused prices of other goods and services in the market to fall marginally (except for investment goods which had increased in price).

The wage rates of all labour groups had fallen compared to the effect of similar changes in the Lump-Sum tax, again at a rate higher than in the case of the other tax instruments discussed earlier. Capital services also declined at a relatively bigger rates. The tax rate increase had also caused the price of imported goods to decline more substantially, with marginal increases in volume.
VI. INCIDENCE OF THE PRIMARY COMMODITIES TAX

This is a tax on producers which includes small scale farmers and sole proprietors who were mostly in the informal labour group. The final consumers in this case are the foreign households. Primary commodities are very elastic in demand whose producers are price takers rather than price setters. The tax base herein is quite broad, with an effective tax rate which is rather low.

The tax rate increase caused prices of primary commodities to rise by about 0.3%, compared to a similar effect due to a Lump-Sum tax. This indicates some degree of forward shifting into the market. Prices of other goods also increased marginally as a result of the primary commodities tax increase, indicating that the tax is relatively less distortionary in its effect on the market. The tax rate increase caused the demand for primary commodities to drop by more than 1.1%.

The effect on the wage rates was however quite extreme. Informal labour wage rates dropped by more than 1.4%, indicating some backward shifting. In the case of other labour groups, however, the tax increase caused wage rates to rise marginally. Further, the profitability rate of firms had fallen at a rate higher than in the case of the other tax instruments described earlier. And imports declined at a mild rate compared to the effect of the Lump-Sum tax.
VII. INCIDENCE OF THE EXPORT TAX ON PRIMARY COMMODITIES

The tax has the same base as the Producer's tax above, but is targeted at consumers, here, foreign buyers. Some Public Finance practitioners believe that this is one of the most effective taxes in the economy as it transfers the tax burden to foreigners and so avoids welfare losses in the economy. The assumption is of course that importers will absorb most of the tax and will not shift the tax backward. The tax base is quite broad with an effective tax rate of about 0.19%.

The elastic nature of these goods is evidenced by the drop in the market price of primary commodities by about 0.4% (compared to 0.3% in the case of the producers tax). This indicates the more sensitive nature of the export tax compared to the producers tax. The effect on the prices of other goods and services was however similar to that in the case of the producers tax. As a result of the tax rate increase, the demand for primary commodities dropped by about 1.3%.

The effect on wage rates was also more substantial here compared to the impact of the Producers tax. The wage rate of informal labour especially, dropped at a much higher rate.

VIII. INCIDENCE OF THE IMPORT TAX

In the model, all imports were assumed to have been undertaken only by the firms sectors. The tax has therefore been targeted at the firms sector only. Most goods have a relatively high elasticity of substitution to imported goods (except for services which have zero elasticities). Locally produced goods are therefore close
substitutes to imported goods. The tax base herein amounts to about 20% of the total trade in the economy, with a relatively high effective tax rate at 6.5%.

The tax rate increase caused the import price to drop by about 0.37%, causing the Malaysian dollar to appreciate in value. The inability of foreign households to shift all the tax forward to consumers indicates the strength of the tax instrument. Prices of other goods and services also fell as a result of the tax rate increase (except for clothing, footwear and manufacturing durables). The demand for imported goods dropped by about 1.3% as a result of the tax rate increase.

The tax rate increase caused wage rates of all labour groups to fall, with the informal labour being the worst effected. In relation to the effect of the Lump-Sum tax, the two top income earners gained some wages. Firms' profitability rate dropped by about 0.33%, which could be inferred by the drop in the prices of some goods and services as well as the drop in the output of some industries.

IX. INCIDENCE OF THE CORPORATE TAXATION

Capital services have a unitary elasticity of substitution with labour services, implying fixed cost shares between these factors. In our model the tax is imposed on households as both shareholders and capital owners. The tax is imposed at a uniform rate on all households groups. Further, the tax base is relatively large, with a high effective tax rates.

The tax rate increase caused the profitability rate to increase by 0.02%, but the effect on the prices of
other goods and services was very mild. It is expected that most of the tax will be absorbed directly by the households groups, and hence no shifting backward or forward will occur.

The wage rate effect has also been mild. Unskilled labour experienced the highest wage rate increase particularly because of the increased demand of their services by the public sector. Informal labour, top management and entrepreneurs on the other hand experienced some decline in wages. Import prices became slightly cheaper and the foreign exchange rate fell as a result of the tax rate increase.

X. INCIDENCE OF PAYROLL TAX

A payroll tax actually exists in the form of the Employees Provident Fund (EPF), or forced saving by the labour force in the economy. Even though there are two portions of EPF, namely the employers contribution (11% of gross pay) and employees contribution (9% of gross pay), for purposes of our evaluation, only the former portion can be regarded as Payroll tax. The latter portion is lumped together with the Income taxes.

In our model, we had assumed that Payroll tax is truly a tax on wage payment, and would therefore not be expected to affect the investment behaviour of wage earners. In actual fact, the EPF was created as a consumption-smoothing device rather than as a method of raising finance for public good. Changes in the Payroll tax rate would therefore be expected to change the consumption behaviour of the wages earners. In our model however, we are narrowing the impact of the Payroll tax change on the behaviour of firms and the public sector.
This tax has a large base and, as it is targeted at the employers whose demand for labour services are quite elastic, some phenomenon of backward shifting is expected. The payroll tax rate increase caused wage rates to drop by more than 1% each (except in the case of the informal labour group which experienced some marginal tax increase). But it must be borne in mind that the Payroll tax cannot cover the informal labour group for practical reasons.

The prices of other goods and services have not changed very much in relation to the effect on the Lump-Sum tax. In fact the effect on other goods and services were considered the mildest in relation to the other tax instrument discussed earlier.

The effect on the profitability rate of the firm was also very mild. This could be explained by the full backward shifting of tax to the labour groups in the form of a wage rate drop. The foreign exchange rate as well as the import volume rose marginally as a result of the tax rate increase.

CONCLUSION ON THE TAX SHIFTING AND INCIDENCE OBSERVATION

In the case of indirect taxes, most tax increases were shifted forward to the final goods market. An exception is notable in the case of taxes on other goods and primary commodities. In the case of direct taxes, on the other hand, most tax increases were absorbed by the household groups themselves. Here however, escalating tax revenue resulted in more public expenditure, including labour services. This meant the wage rate also increased.
TAX PRODUCTIVITY ANALYSIS

As the set of figures after normalisation adjustment was basically the same as that used in the tax productivity analysis based on the absolute tax change, an analysis using the normalised figures would not have resulted differently. We therefore omitted the tax productivity analysis also. Analysis would however be attempted in the course of evaluating each of the tax reform proposals.

B. ANALYSIS OF TAX EFFICIENCY BASED ON THE EFFECT OF NORMALISED CHANGES IN THE TAX INSTRUMENTS

We attempted another analysis of tax efficiency, to strengthen the findings made earlier in the absolute analysis using a slightly different methodology.

I. METHODOLOGY OF ANALYSIS

Two measures were chosen for purposes of this efficiency analysis. The first measure is similar to the one used in the absolute analysis. However, instead of presenting the net welfare change\(^{35}\), the ratio of public sector welfare gains to the private sector welfare losses was presented. This ratio indicates the net welfare gains per M$ of welfare losses\(^{36}\). Bear in mind that, for a public utility increase, the figure would exactly amount to 1% of the public expenditure after the normalisation process. The figure would be consistent for all tax instruments as all of them were normalised. The second

\(^{35}\) Difference between public sector’s welfare gains and the private sectors’ welfare losses.

\(^{36}\) Assuming that we are only interested in the private households or local households welfare.
measure looked at the additional tax revenue generated from the tax instrument change as the basis for measuring benefit from the tax rate increase. These figures were divided by the welfare loss figure suffered by the private households. This ratio indicates the additional tax revenue per M$ of welfare loss. Two ranking were made based on the two measures as shown in Table 5.8 below.

II. FINDINGS OF THE ANALYSIS

To review the comparison made between the results of the analysis based on the absolute tax change with that of the first measure in the normalised changes analysis, in Table 5.3., we found that in most cases, the ranking results were quite consistent. There were however three cases where the ranking significantly differed. Tax efficiency analysis using two other different measures as shown in Table 5.8. also reveal a parallel result. The divergence in ranking could be traced to the high percentage normalisation imposed on these taxes.

Comparison between the two measures under the normalised analysis also showed high consistency in the ranking made. Significant differences between these two measures were on the sales tax on households services and excise tax on petroleum. These differences could be traced to the difference in the proportion of tax revenue to the public sector welfare increase.

---

37 As suffered by the private households.
38 i.e. Excise tax on petroleum, income tax on skilled labour and on top management.
Overall, the tax on the Clothing and Footwear was regarded as the most efficient tax instrument in the economy. This was followed by the tax on manufacturing durables, Corporate tax, Import tax and the Sales tax on foods.

At the other extreme, Payroll tax was regarded as the least efficient tax instrument, followed by the Sales tax on other goods, beverage and tobacco and the income tax on entrepreneurs and semi-skilled labour.
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>T.Tax revenue</td>
<td>Publ.util.</td>
<td>%</td>
</tr>
<tr>
<td>Sales tax on food</td>
<td>243.190</td>
<td>177.784</td>
<td>265.6</td>
</tr>
<tr>
<td>Sales tax on B &amp; T</td>
<td>323.139</td>
<td>180.273</td>
<td>265.6</td>
</tr>
<tr>
<td>Sales tax on Clot&amp;Fw</td>
<td>66.200</td>
<td>173.571</td>
<td>265.6</td>
</tr>
<tr>
<td>Sales tax on Mfg.D.</td>
<td>161.986</td>
<td>147.531</td>
<td>265.6</td>
</tr>
<tr>
<td>Sales tax on Hsld.S.</td>
<td>271.089</td>
<td>148.201</td>
<td>265.6</td>
</tr>
<tr>
<td>Sales tax - Oth.gds.</td>
<td>289.745</td>
<td>130.490</td>
<td>265.6</td>
</tr>
<tr>
<td>Prod.tax - P.Comm.</td>
<td>265.738</td>
<td>177.879</td>
<td>265.6</td>
</tr>
<tr>
<td>Excise tax - Petrl.</td>
<td>280.608</td>
<td>127.234</td>
<td>265.6</td>
</tr>
<tr>
<td>Export tax - P.Comm</td>
<td>267.390</td>
<td>178.071</td>
<td>265.6</td>
</tr>
<tr>
<td>Import tax</td>
<td>212.887</td>
<td>154.328</td>
<td>265.6</td>
</tr>
<tr>
<td>Inc.tax - Unskl.lab.</td>
<td>275.363</td>
<td>175.486</td>
<td>265.6</td>
</tr>
<tr>
<td>Inc.tax - Smskl.lab.</td>
<td>284.509</td>
<td>176.348</td>
<td>265.6</td>
</tr>
<tr>
<td>Inc.tax - Skld.lab.</td>
<td>273.648</td>
<td>184.485</td>
<td>265.6</td>
</tr>
<tr>
<td>Inc.tax - Top mgmt.</td>
<td>279.448</td>
<td>186.496</td>
<td>265.6</td>
</tr>
<tr>
<td>Inc.tax - Entrp.</td>
<td>560.870</td>
<td>188.985</td>
<td>265.6</td>
</tr>
<tr>
<td>Corporate tax</td>
<td>226.720</td>
<td>186.783</td>
<td>265.6</td>
</tr>
<tr>
<td>Payroll tax</td>
<td>311.377</td>
<td>179.220</td>
<td>265.6</td>
</tr>
<tr>
<td>Lump sum tax</td>
<td>306.998</td>
<td>-</td>
<td>265.6</td>
</tr>
</tbody>
</table>

Source: Compiled from the result of the G.E. model.
C. ANALYSIS OF THE DISTRIBUTION IMPACT BASED ON THE NET EFFECT OF THE LUMP SUM TAX CHANGE

To make the comparison between various tax instruments more realistic, the analysis figures took the net of Lump-sum Tax as the base.

I. METHODOLOGY OF ANALYSIS

Taking the lump sum tax effect as the base, the net welfare change figures\(^{39}\) for each of the tax instruments based on the normalised effect are estimated. Atkinson's inequality aversion index is also applied on these figures using the index of 1, 2 and 3. The Lump-sum Tax net welfare change figures are then subtracted from the net welfare changes of each of the tax instruments\(^{40}\). The summarised result of the income distribution analysis performed is presented in a comparative form in Table 5.9. Next, we attempted to rank each of the tax instrument in terms of these comparative figures above to gauge the equity performances of each of the tax instruments.

II. FINDINGS OF THE ANALYSIS

The first row of Table 5.9 shows the distributional effect of the lump sum tax changes, which was used as the basis of comparison. As expected, the distributional impact was regressive because the tax was not designed to achieve an equity distribution, but rather to achieve

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\(^{39}\) Defined as the sum of the welfare changes of all private households.

\(^{40}\) All the four sets of figures were subtracted and presented.
greater efficiency\textsuperscript{41}.

When we observed the equity distributional impact based in Table 5.9, it was clear that apart from the tax on clothing and footwear, all other indirect taxes were regressive. The worst was the export tax and the producers tax on primary commodities.

Direct taxes, apart from the payroll tax, were, however, found to be quite progressive. This seems logical considering the direct nature of the taxes. In the case of payroll tax however, the regressive impact was caused by the backward shifting of tax liabilities by the producers to the labour groups which affects private households directly. The regressiveness of the tax had however been made milder by the positive impact on the Informal labour group who are not subjected to the tax.

Bear in mind that figures shown in Table 5.9 are that net of the Lump-sum Tax changes. Lump sum tax changes resulted in welfare losses experienced by each of the private households group. The severe welfare losses suffered by these private households made most of the other tax instruments look progressive. To avoid reaching this type of conclusion, analysis must focus on the ranking of tax instruments that follows.

\textsuperscript{41} It must be remembered that the tax is imposed in an economy which is not optimal, hence not producing the desired result.
### Table 5.9.

PRIVATE HOUSEHOLDS NET WELFARE CHANGES  
(in relation to the effect of change in the Lump sum tax)  
at various level of inequality aversion  
(IN M$ MILLION)

<table>
<thead>
<tr>
<th>Original total chg. in net welfare</th>
<th>Net welfare changes at various welfare Av. Fact.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Lump sum tax</td>
<td>-306.998</td>
</tr>
<tr>
<td>Sales tax on food</td>
<td>+63.808</td>
</tr>
<tr>
<td>Sales tax on bev.&amp; Tobb.</td>
<td>-16.141</td>
</tr>
<tr>
<td>Sales tax on Clot.&amp; Fw.</td>
<td>+240.798</td>
</tr>
<tr>
<td>Sales tax on Mfg.Dur.</td>
<td>+128.203</td>
</tr>
<tr>
<td>Service tax on Hsld.ser.</td>
<td>+34.832</td>
</tr>
<tr>
<td>Sales tax on Oth.goods</td>
<td>+60.854</td>
</tr>
<tr>
<td>Producers Prim.comm. tax</td>
<td>-24.523</td>
</tr>
<tr>
<td>Excise tax - Petroleum.</td>
<td>+54.808</td>
</tr>
<tr>
<td>Import tax</td>
<td>+94.112</td>
</tr>
<tr>
<td>Export taxes</td>
<td>-15.047</td>
</tr>
<tr>
<td>Inc.tax - Unskld.lab.</td>
<td>-69.783</td>
</tr>
<tr>
<td>Inc.tax - Semiskld.lab.</td>
<td>+22.489</td>
</tr>
<tr>
<td>Inc.tax - Skilled lab.</td>
<td>+33.350</td>
</tr>
<tr>
<td>Inc.tax - Top mgmt.</td>
<td>+27.549</td>
</tr>
<tr>
<td>Inc.tax - Entrepreneurs</td>
<td>+253.872</td>
</tr>
<tr>
<td>Corporate tax</td>
<td>+80.278</td>
</tr>
<tr>
<td>Payroll tax</td>
<td>-4.379</td>
</tr>
</tbody>
</table>

Source: Compiled from the result of the G.E. analysis.

To provide a clearer picture of income distribution, an attempt was made to rank tax instruments in terms of income distribution in relation to each...
inequality aversion index used. The result is shown in Table 5.10. For example, based on the first column, where we are indifferent about inequality aversion, income tax on the entrepreneurs group, Sales tax on Clothing and footwear and the tax on manufacturing durables emerged as amongst the best tax instruments.

When we began to provide some concern for inequality by giving a higher weight to the income of the poorest group in the economy\textsuperscript{42}, we found that income taxes outshined most of the tax instruments\textsuperscript{43}. As we increased the concern for inequality, the superiority of income taxes in this distributional role became distinct.

\textsuperscript{42} By giving higher weight to the informal labour groups in determining the net welfare changes of the households groups.

\textsuperscript{43} Except for the tax on clothing and footwear.
### TABLE 5.10.

**TAX BURDEN DISTRIBUTION RANKING OF TAX INSTRUMENTS**  
Based on the weighted average rate of net welfare change at various levels of inequality aversion

| Tax Instrument                        | At origin, net welf. changes | At an ineq. aver. index of
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Sales tax on food</td>
<td>7</td>
<td>13</td>
</tr>
<tr>
<td>Sales tax on bev.&amp; Tobb.</td>
<td>16</td>
<td>14</td>
</tr>
<tr>
<td>Sales tax on Clot.&amp; Fw.</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Sales tax on Mfg.Dur.</td>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td>Service tax on Hsld.ser.</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Sales tax on Oth.goods</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Producers Prim.comm. tax</td>
<td>17</td>
<td>17</td>
</tr>
<tr>
<td>Excise tax - petroleum.</td>
<td>9</td>
<td>7</td>
</tr>
<tr>
<td>Export tax</td>
<td>15</td>
<td>16</td>
</tr>
<tr>
<td>Import tax</td>
<td>4</td>
<td>11</td>
</tr>
<tr>
<td>Payroll tax</td>
<td>14</td>
<td>9</td>
</tr>
<tr>
<td>Inc.tax.-Unskld.lab.</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>Inc.tax.-Semiskld.lab.</td>
<td>13</td>
<td>8</td>
</tr>
<tr>
<td>Inc.tax.-Skilled lab.</td>
<td>11</td>
<td>4</td>
</tr>
<tr>
<td>Inc.tax.-Top. mgmt.</td>
<td>12</td>
<td>2</td>
</tr>
<tr>
<td>Inc.tax.-Entrepreneurs</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Corporate tax</td>
<td>5</td>
<td>17</td>
</tr>
</tbody>
</table>

Source: Compiled from the result of the G.E. analysis.

Overall, in terms of distribution, the most progressive tax instruments are the income tax on entrepreneurs, followed by taxes on the top management and skilled labour. The Payroll tax and the Sales tax on
Clothing and Footwear were also found to be quite progressive.

At the other extreme, the export tax on primary commodities was regarded as the most regressive tax instrument, followed by the export tax on the same products, and Sales taxes on manufacturing durables, beverage and tobacco and foods items.

5.7. PRELIMINARY CONCLUSION

The first part of the discussion herein examined the initial results of the general equilibrium model employed in the research by analysing the general effect of tax changes on market prices of goods and services, wages rates and the foreign exchange rate. Discussion then was expanded to include the effects of tax instrument changes on the tax revenue generation, efficiency and tax burden distribution. A measure of tax productivity was created. Ranking was imposed on the tax instruments based on this criterion. This was then followed by the observation of the efficiency criterion based on the net real income change in the economy. To expand the analysis further, two measures were introduced, i.e. the ratio of welfare gains of the public sector to the welfare losses of the private households and the ratio of marginal tax revenue to welfare losses of the private sector. After the rankings were scaled, a general comparison of tax instruments in terms of these criterion was made.

44 by determining the expected marginal tax revenue, defined as the product of % tax increased and the original tax base (assuming that the market behaviour is citeras peribus). This was then compared with the actual marginal tax revenue determined by the general equilibrium model result.
Next, a measure was created to gauge the equity distribution impact of each of the tax instruments. Different inequality aversion level were used to show effects of a tax burden distribution from each of the tax instrument changes. This allowed us to rank taxes in terms of equity distribution objectives.

It should be emphasized that the analysis in the first part above was based on the absolute tax changes assumption. This was altered in the second part by normalizing each of the tax instrument using the Public sector utility level as the starting point. All tax instruments changed their rates so as to generate tax revenue sufficient to compensate the public sector utility losses as the result of the individual tax instrument change. In the analysis, Lump-sum Tax was taken as the standard of yardstick. Figures used in the analysis were therefore net of changes in the Lump-sum Tax.

From the analysis, we were able to identify the strengths and weaknesses of each of the tax instruments. This not only enabled us to classify tax instruments standing and their role in the total tax system but also to identify their potential role in guiding the direction of future tax reforms.

Most importantly, this analysis will form the basis of the actual evaluation of the 1988 tax reform, which will be attempted in the next part. The tax reform evaluation will utilise the appropriate tax instrument results that are relevant in the reform to be further extrapolated.
5.8. EVALUATION OF SOME OF THE MINOR REFORM PROPOSALS

To start with the actual tax reform evaluation effort, we will evaluate the minor reform proposals made by the tax reform group. Two main proposals were advanced much more thoroughly and are outlined in the two following chapters.

A. EVALUATION OF THE SALES TAXES REFORM

As a short term measure before the Value-Added Tax system could be introduced into the economy, several reform proposals were made to improve the present Sales tax system.

I. METHODOLOGY OF ANALYSIS

Instead of attempting a separate evaluation of each proposals, we had use an indirect approach by reviewing each of the tax instruments under the Sales tax and evaluate some of the proposals at the same time. A counter proposal will then be made on the whole Sales tax system. Discussion on the background of the Sales tax system and some of the reform proposals precede the Sales tax analysis.

II. FINDINGS OF THE ANALYSIS

The 1988 tax reforms proposal recommended that the Sales tax statutory rates be doubled (from the present 5% to 10%) to increase tax revenue and compensate for the

---

1 As described quite exhaustively in chapter 2.

2 In terms of the three tax reforms objectives of tax revenue generation, economic efficiency and tax burden distribution.
revenue loss\textsuperscript{47} as a short term measure.

The present Sales taxes contributed to approximately 21\% of the total tax revenue or almost 50\% of the Indirect taxes (which is worth about M$ 5,107.4 million). Except for the beverage and tobacco tax rate (which is at 55\%), and the tax on other goods (at 8\%), the effective tax rate on most goods was relatively low (i.e. at less than 3.5\% each). Sales taxes were found to be quite unproductive in generating tax revenue (except for the beverage and tobacco tax).

Some of the tax instruments in the Sales tax\textsuperscript{48} were quite efficient in the economy. But overall, tax instruments were extremely regressive in terms of their tax burden distribution impact (except for the tax on clothing and footwears). These are shown in Table 5.11 below.

\textsuperscript{47} As a result of reducing corporate tax rates.
\textsuperscript{48} Particularly taxes on manufacturing durables, clothing and footwears and food items.
<table>
<thead>
<tr>
<th>SALES TAXES EFFECTS</th>
<th>FOOD &amp; TOBB.</th>
<th>CLOTH. &amp; F.W.</th>
<th>MFG. DURB.</th>
<th>OTHER GOODS</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. TAX REVENUE</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% OF NAT. INCOME</td>
<td>0.1276</td>
<td>0.0184</td>
<td>0.0287</td>
<td>0.1427</td>
</tr>
<tr>
<td>IN M$ MILLIONS</td>
<td>122.16</td>
<td>17.62</td>
<td>27.48</td>
<td>136.62</td>
</tr>
<tr>
<td>TAX REV./PRVT. WLF.</td>
<td>M$0.731</td>
<td>M$0.557</td>
<td>M$2.620</td>
<td>M$0.910</td>
</tr>
<tr>
<td>B. EFFICIENCY</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>REAL NAT. INCOME CHG.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IN M$ MILLIONS</td>
<td>-1.819</td>
<td>-3.064</td>
<td>-2.872</td>
<td>-17.903</td>
</tr>
<tr>
<td>PUB. UTILITY. INCREASED</td>
<td>+182.39</td>
<td>+25.972</td>
<td>+42.064</td>
<td>+246.04</td>
</tr>
<tr>
<td>T.WLF./$ TAX REV.</td>
<td>$+.1228</td>
<td>$-.3178</td>
<td>$+1.150</td>
<td>$+.7027</td>
</tr>
<tr>
<td>PRT. WLF./$ TAX REV.</td>
<td>M$-1.37</td>
<td>M$-1.79</td>
<td>M$-0.38</td>
<td>M$-1.10</td>
</tr>
<tr>
<td>PRT. WLF./PUBL. UTILITY</td>
<td>M$-.92</td>
<td>M$-1.22</td>
<td>M$-.249</td>
<td>M$-.610</td>
</tr>
<tr>
<td>C. INC. DISTRIBUTION</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Informal labors</td>
<td>$-83.60</td>
<td>$-12.933</td>
<td>$-5.914</td>
<td>$-40.274</td>
</tr>
<tr>
<td>Unskilled labor</td>
<td>$-16.77</td>
<td>$-4.710</td>
<td>$-0.354</td>
<td>$-17.447</td>
</tr>
<tr>
<td>Semiskilled lab</td>
<td>$-6.64</td>
<td>$-2.576</td>
<td>$+1.892</td>
<td>$-1.813</td>
</tr>
<tr>
<td>Skilled labors</td>
<td>$-23.89</td>
<td>$-5.113</td>
<td>$-0.752</td>
<td>$-22.556</td>
</tr>
<tr>
<td>Top management</td>
<td>$-13.85</td>
<td>$-2.698</td>
<td>$-1.222</td>
<td>$-15.979</td>
</tr>
<tr>
<td>Entrepreneurs</td>
<td>$-22.27</td>
<td>$-3.576</td>
<td>$-4.139</td>
<td>$-52.022</td>
</tr>
<tr>
<td>TOTAL PRIVATE WLF</td>
<td>$-167.02</td>
<td>$-31.606</td>
<td>$-10.489</td>
<td>$-150.09</td>
</tr>
</tbody>
</table>

Source: Compiled from the result of the G.E. analysis.

Table 5.11 could also be used to compare performances of each of the tax instruments under the
Sales taxes banner. In terms of tax revenue generation, sales tax clothing and footwear was found to be most productive. The ratio of marginal tax revenue per M$ of private households welfare losses on the third row of the Table shows that the tax instrument is a superior one. The tax on other goods is, on the other hand, found to be the least productive in relation to the private burden generation.

In terms of efficiency, three measures were generated to enable a comparison of the performance of each tax instrument. The first measure attempted to relate total welfare loss\(^5\) with the marginal tax revenue\(^6\). The second measure only related the private welfare losses with the marginal tax revenue\(^7\). The third measure related the private welfare losses with the public utility increase\(^8\). All the ratios above measure efficiency negatively\(^9\).

Under the first measure, the clothing and footwear tax was found to be most efficient, while the beverage tax

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\(^5\) measured by the net real national income changes caused by the tax rate change.

\(^6\) \[
\frac{\text{Marginal Real National Income}}{\text{Marginal Tax Revenue}}
\]

\(^7\) \[
\frac{\text{Marginal Private Welfare Loss}}{\text{Marginal Tax Revenue}}
\]

\(^8\) \[
\frac{\text{Marginal Private Welfare Loss}}{\text{Marginal Public Utility Incrs.}}
\]

\(^9\) Meaning, the smaller the ratio, the better the instrument in terms of efficiency criterion.
and tobacco tax the least. Under the second measure, the tax on clothing and footwear again was the best, while tax on other goods the worst. Finally, under the third measure, the same result again. The first measure could be viewed as most general as it relates total welfare loss, while the second and third are confined to the effect on the private households. The third measure is considered more pertinent, as we compare utility with utility. We could therefore conclude that the tax on clothing and footwear is the most efficient while the tax on beverage and tobacco, the worst. This is quite consistent with the tax revenue generation rating above.

In terms of tax burden distribution, we need to compare the pattern of real income changes experienced by each of the household groups as a result of the tax increase. A crude observation would show that again the clothing and footwear tax came out as the most equitable taxes\(^5^4\). The tax on food is be the most regressive.

Based on these observations, a blanket increment in the tax rates on all goods involved in the Sales tax is too crude. We could therefore counter proposed by recommending that the tax rate on clothing and footwears be raised. The present effective rate is only 3.4%. An increase of 6.6% would roughly increase the tax revenue approximately M$ 181 million\(^5^5\). It would increase public utility by an amount worth M$ 277 million (or net welfare increase of approximately M$ 200 million over

\(^{5^4}\) Even though, overall, it is still regressive as the informal labours groups were made to suffer a relatively large real income loss.  
\(^{5^5}\) Based on M$ 4,706.54 billion tax base, and 58.43% tax productivity ratio.  

\[ \text{MTR} = 4,706.54 \times 0.066 \times 0.5843 = \text{M$ 181.5 million}. \]
the private welfare losses), which would improve overall efficiency in the economy. Another possibility would be to increase the tax rate on manufacturing durables, as the marginal public utility increase is still positive compared to the private utility loss. An increase of 6.8% over the current effective rate of 3.15% would generate nearly M$1 billion of additional tax revenue. The Public utility gains generated would be approximately M$ 1,670 million (or net welfaregains of about M$ 649 million over the private welfare losses). Increasing the rates on manufacturing durables is actually consistent with the original tax reform proposal of increasing rates and broadening the tax base as described earlier.

Other tax instruments were considered non viable as private welfare losses from the tax revenue increase would be higher than the public utility increase as shown by the third ratio described above. Broadening the tax base in other cases would effectively mean, raising the tax rates, particularly on other goods. As shown from the analysis based in Table 5.12 above, this will not be viable as a M$ 1 increase in tax revenue would generate an extra net private welfare loss over public sector welfare gains of about M$ 0.091 (which is a net loss situation). Furthermore, the effect on income distribution would be quite severe as shown from the Table.

B. EVALUATION OF THE PROPOSALS ON THE EXPORT AND PRODUCERS TAXES ON PRIMARY COMMODITIES

The 1988 tax reform proposal recommended that export and producers commodities taxes on the small and traditional commodities industries be abolished. It is basically targeted at relieving the informal labors group
from suffering taxes on their produce. This is difficult to implement as primary commodities are produced both by small traditional producers as well as big plantation companies. The marketing channel for products overlapped in that small scale producers sell their goods to large planters.

Several ways in which we could separate the two producers and discriminate them in terms of tax imposition are as follows:

* We could establish a formal channel of marketing for small producers especially in buying produce of small and traditional producers directly from them. This would mean competing with the big producers in the market in terms of prices and credit facilities. By exempting the marketing organisation's activity from producers as well as export taxes, we would effectively exempt all small producers from these taxes, provided, of course, that the organization in turn passed the tax exemption benefit directly to the small producers in the form of a higher price.

* The second less complicated method is to abolish all export taxes on economic activities that involve small and traditional producers, mostly in the rubber, oil palm and cocoa industry and replace them with an agricultural or land taxes on plantation owners. This

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56 Which had directly or indirectly make their income lower either because of the effectively lower commodities prices or lower demand for their products.

57 As most wholesalers provide credit facilities to small producers in lieu of future payment for their produce.

58 This also assumed that the marketing organisation created could operate efficiently without having to waste the tax benefit in the form of administrative inefficiency.
could be done by prescribing the minimum land acreage (say 100 acres) before the land or agricultural tax would be imposed. The tax would be imposed on an annual basis with the rates adjusted to match the tax revenue need of the economy. It is still possible for plantation companies to shift the tax burden backward to their workers but the effect would be less damaging compared to the present commodities and export tax system. Danger could occur where distortion would be created in the economy by the land breaking activities to avoid from paying Land taxes.

I. METHODOLOGY OF ANALYSIS

The previous method of analysis is again followed here. Data on tax revenue, economic efficiency and tax burden distribution impact was extracted and presented in the form of comparison between Producers tax and export taxes as shown in Table 5.12 below.
<table>
<thead>
<tr>
<th>Effect of a 1% increased in tax rate</th>
<th>Commodity taxes</th>
<th>Export taxes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. POTENTIAL IMPACT ON TAX REVENUE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tax revenue gain in % of national inc.</td>
<td>0.2526%</td>
<td>0.1864%</td>
</tr>
<tr>
<td>in M$ millions</td>
<td>M$ 241.8m</td>
<td>M$ 178.5m</td>
</tr>
<tr>
<td>Tax rev.gain per M$ of prvt.welf.loss</td>
<td>M$ 0.669</td>
<td>M$ 0.666</td>
</tr>
</tbody>
</table>

| **B. POTENTIAL EFFECT ON EFFICIENCY** |                       |               |
| Real national income changes        |                       |               |
| in M$ millions                      | M$+0.0 m             | M$-1.0 m      |
| Public utility increased (M$’mills) | M$ 360.9             | M$ 266.1      |
| T.welf.L/G per M$ of tax revenue gain | M$+0.0             | M$-0.0056     |
| Prvt.welf.loss per M$ of tax rev.gain | M$ 1.494           | M$ 1.501      |
| Prvt.welf.loss per M$ of pb.util.gain | M$ 1.001          | M$ 1.007      |

| **C. POTENTIAL IMPACT ON INCOME DISTRIBUT.** |                   |               |
| Informal labours (increased)          | $-298.92m         | $-219.54m     |
| Unskilled labours                     | $+ 47.36m         | $+ 60.56m     |
| Semi-skilled labours                  | $+ 19.21m         | $+ 17.48m     |
| Skilled labours                       | $- 47.83m         | $- 51.20m     |
| Top management                        | $- 26.70m         | $- 25.90m     |
| Entrepreneurs                         | $- 54.29m         | $- 49.33m     |
| (in real income changes)              |                   |               |
| Total private welfare gains           | M$-361.2m         | M$-267.9m     |

Source: Compiled from the results of the G.E. analysis
II. FINDINGS OF THE ANALYSIS

The existing export tax is not as inefficient as the commodities tax. It is also less productive in generating tax revenue. In terms of equity distribution however, the tax is better than commodities tax. Partly abolishing the tax would probably improve the economy's efficiency level, especially if it is to be replaced by the commodities tax. This is because the tax is now contributing to a net welfare loss in the economy.

The producers tax on primary commodities was, on the other hand, found to be very efficient (the most efficient among all the tax instruments). It was also more productive compared to the export tax in generating tax revenue. The increased rate to compensate the tax revenue loss from partly abolishing export tax would be expected to substantially improve efficiency in the economy. In terms of tax revenue generation, a smaller tax rate increase would compensate for the reduction in the export tax since the base for both taxes is common.

A counter proposal would be to abolish the export tax and raise the rate on the commodities tax to compensate for the tax revenue loss. This would improve the economy's overall efficiency in terms of welfare gains generated. It would also mean that more tax revenue would be collected since commodities tax was more productive overall. By exempting small scale producers at the same time, a better equity distributional impact is certain as the current negative distributional impact was primarily caused by the high burden on the smallholders (informal labours).
An abolition of export taxes, which are at an effective rate of 5%, would reduce tax revenue by about M$ 892.5 million. This would result in a public utility loss of approximately M$ 1,330 million, and increase the private households welfare by approximately M$ 1,339 million. This means, the economy would gain economic efficiency worth of approximately M$ 9 million. The Producers tax on primary commodities, which is currently at 0.75%, will have to be raised by 5% to generate enough tax revenue to compensate the tax revenue loss experienced because of the export tax abolishment. Public utility would increase by approximately M$ 1,331.6 million, while private utility would decline by approximately M$ 1,333 million. The net welfare losses would be approximately M$ 1.4 million, i.e. 15% of those under the export tax.

With only producers' tax existing in the economy, efforts to consciously exempt the small scale producers would be more manageable. If this could be achieved, the tax burden distribution created by tax instruments would improve dramatically, rendering producer tax an effective instrument in the economy.

C. EVALUATION OF THE REFORM PROPOSALS ON IMPORT TAX

A recommendation was made for further strengthening of the present import tax system by abolishing all forms of exemption and introducing a standard or uniform rate on all products. The proposals aims at intensifying or broadening the tax base and fully exploiting the tax instrument to improve tax revenue and efficiency in the economy.
I. METHODOLOGY OF ANALYSIS

Again, we used a similar method by extracting data on the performances of import taxes in terms of tax productivity, economic efficiency and income distribution from the earlier analysis and presented them in a Table. This is shown on the left column of Table 5.13.

The counter proposal is to abolish import taxes on manufacturing durables only. To evaluate the proposal, we altered the benchmark data by transferring all import taxes currently imposed on manufacturing durables items onto other goods imported into Malaysia. This is in line with the base broadening reform proposals on the import taxes. We assumed that to add the items covered by import tax, we would have to bring in some of the items from other goods categories which are currently exempted from import tax. This would effectively raise the effective import tax rate on other goods. We retained the total import tax collection to keep the benchmark data set balance.

Since we are interested in observing the total impact of the tax, we extrapolated the effect of the 1% tax rate change by the current effective tax rate on imported goods of 6.4675. Both sets of data from the results of the general equilibrium run as presented on the right column of Table 5.13 and the current impact of the tax as presented on the left column reflect the total rather than marginal impact.
<table>
<thead>
<tr>
<th>Impact in each situation at actual rates</th>
<th>Present Import Tax</th>
<th>Exempting Mfg. Durable</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. POTENTIAL IMPACT ON TAX REVENUE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tax revenue gain in % of national inc.</td>
<td>1.1583%</td>
<td>1.1764%</td>
</tr>
<tr>
<td>in M$ millions</td>
<td>$1,108.9m</td>
<td>$1,126.3m</td>
</tr>
<tr>
<td>Tax rev.gain per M$ of prvt.welf.loss</td>
<td>M$ 0.725</td>
<td>M$ 0.737</td>
</tr>
<tr>
<td><strong>B. POTENTIAL EFFECT ON EFFICIENCY</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Real national income changes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>in M$ millions</td>
<td>$-378.93m</td>
<td>M$-362.8m</td>
</tr>
<tr>
<td>Public utility increased (M$'mills)</td>
<td>M$1,907.3</td>
<td>M$1,931.3</td>
</tr>
<tr>
<td>T.welf.gain per M$ of tax revenue gain</td>
<td>M$+0.341</td>
<td>M$+0.3588</td>
</tr>
<tr>
<td>Prvt.welf.loss per M$ of tax rev.gain</td>
<td>M$-1.379</td>
<td>M$-1.356</td>
</tr>
<tr>
<td>Prvt.welf.loss per M$ of pb.util.gain</td>
<td>M$-0.802</td>
<td>M$-0.791</td>
</tr>
<tr>
<td><strong>C. POTENTIAL IMPACT ON INCOME DISTRIBUT.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Informal labours ( increased )</td>
<td>$-832.08m</td>
<td>$-838.83m</td>
</tr>
<tr>
<td>Unskilled labours</td>
<td>$+128.37m</td>
<td>$+132.58m</td>
</tr>
<tr>
<td>Semi-skilled labours</td>
<td>$+ 41.20m</td>
<td>$+ 44.37m</td>
</tr>
<tr>
<td>Skilled labours</td>
<td>$-302.27m</td>
<td>$-301.39m</td>
</tr>
<tr>
<td>Top management</td>
<td>$-168.32m</td>
<td>$-168.16m</td>
</tr>
<tr>
<td>Entrepreneurs</td>
<td>$-395.89m</td>
<td>$-395.81m</td>
</tr>
<tr>
<td>( in real income changes )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total private welfare loss</td>
<td>-1,529.0m</td>
<td>-1,527.2m</td>
</tr>
</tbody>
</table>

Source: Compiled from the results of the G.E. analysis.
II. FINDINGS OF THE ANALYSIS

The import tax was among the most efficient tax instruments in the economy to the household group as discovered in the earlier analysis. The tax resulted in a small tax burden experienced by private households compared to the resulting public utility increase. The tax was harsh on the informal labours group and the three top brackets groups. The tax was least productive in generating tax revenue, making its potential for expansion rather limited. In terms of income distribution effect, the tax was quite regressive, particularly because of its effect on the informal labours group.

Based on this information, it is difficult to substantiate the rationale for expanding import tax to improve tax revenue and to help correcting the income distribution state in the economy. The efficiency argument is, however, quite strong. For every dollar increase in the tax revenue, public utility will increase by M$ 1.72 and private welfare loss will only increase by M$ 1.38, giving a net utility gain of about M$ 0.34 (or 25% of the welfare loss). As an alternate strategy, we might broaden the scope of the tax by bringing in other goods and services while also exempting manufacturing durables as they are quite substantially consumed by the lower income groups. As consumption on manufacturing durables is often the yardstick for the standard of living in an economy, exempting import taxes on the goods which were largely obtained from abroad would indirectly raise the standard of living in the country. At the same time this would help correct the regressive impact on the equity distribution currently observed under the import tax system.
A comparison between the two columns in Table 5.13 would enable us to select between the two strategies proposed above. The Table shows that in terms of efficiency, the latter strategy is superior. It increased the public utility by M$ 24 million, while at the same time reducing the private household's welfare loss by approximately M$ 1.8 million (making a total efficiency improvement in the economy worth approximately M$ 25.8 million).

In terms of total tax revenue, the new import tax would produce approximately M$ 17.4 million extra revenue. This extra revenue would be generated from the broader tax base on the 'other goods'.

Most importantly, the new Import tax would be seen to improve the income distribution or tax burden distribution in the economy. The informal labor experienced a further M$ 6.75 million in welfare loss, while the other households groups experienced some welfare gains, with the low and medium income group enjoying the most gains (M$ 4.1 and M$ 3.17 million respectively). The overall distributional impact is expected to be slightly better as the percentage of welfare gains experienced by the two low and medium income groups was higher than those of the informal labors (3.19% and 7.69% respectively compared to 0.8% experienced by the informal labors groups). The large expected improvement in equity distribution does not materialize because of the indirect impact the tax has on the wage rates of the informal labours group. This rate dropped as a result of the new tax, reflecting the

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59 Reflected in the model by the increase in the effective tax rate on the industry.

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complexity of the tax instruments impact on the economy.

Overall however, the new import tax is superior compared to the present import tax system. The import tax exemption on the manufacturing durables would also create an indirect impact of promoting a higher standard of living in the economy.

5.9. CONCLUSION

We have attempted an evaluation of the minor reform proposals made in the 1988 Tax Reform agenda. Most of the other reform proposals related to direct and indirect taxes were administrative in nature and could not be evaluated quantitatively using the model that we employed. The proposals to broaden the tax base on services tax, and to increase the rate on Excise tax could be crudely evaluated by noting the results of the analysis on tax revenue productivity, economic productivity and tax burden distribution discussed earlier.

Discussion on the tax reform evaluation above is a prelude to the more specific evaluation of the tax reform proposals, namely the proposal to reduce Corporate tax rate by 10% and to introduce a Value-Added Tax system to replace the current Manufacturer’s Sales tax system.
CHAPTER 6

ANALYSIS OF THE PROJECTED IMPACT OF INTRODUCING VALUE ADDED TAXES IN MALAYSIA

6.1. INTRODUCTION

This chapter evaluates the proposal to introduce a Value Added Tax system in Malaysia as an alternative to the current Manufacturing Sales tax system. In the analysis, we will assume that the new Value-Added Tax system had been in operation and so measure the impact of the new tax system. We then attempt to compare this impact with the impact of the Manufacturing Sales tax system described earlier. We will attempt to normalise the impact figures to make them comparable by keeping the tax rates consistent\(^1\). Three sets of impact figures will be presented for comparison purposes\(^2\).

The chapter will start by presenting the drawbacks and weaknesses observed in the current Manufacturing Sales Tax system. It will then introduce the Value-added Tax system by briefly describing some of the pertinent issues in the system. Discussion will then continue on the methodology of the analysis. This is crucial as the study entails the establishment of a new benchmark data set and assumes a different economic position for the purposes of the general equilibrium model\(^3\). Discussion on

\(^1\) Both at original Sales tax rates and at the new Value-Added Tax rate.

\(^2\) Each representing the possible type of Value-Added Tax system, namely the Consumption type, Income type and Consumption with food tax.

\(^3\) A separate model assumption is used and the general equilibrium model has been run to obtain a new result of tax change impacts under the Value-Added Tax system.
the result will be made first by comparing the impact of the three types of Value-Added Tax systems, followed by a comparison between the Value-Added Tax\textsuperscript{4}, and Manufacturing Sales tax system.

General Commodities taxes in Malaysia consist of a set of indirect taxes imposed on different agents at different stages in economic activity. It includes a single stage Sales tax imposed on manufacturers and on the importation of goods, Excise tax imposed on several specific goods\textsuperscript{5}, and services tax on the income of specific establishments\textsuperscript{6}. They are multirate taxes with rates ranging from as low as 3\% on some food items to as high as 50\% on cosmetics goods. Exemptions are provided on selected food items, household goods and agricultural inputs.

The Malaysian Treasury department is looking at an option to restore the tax buoyancy that is falling as a result of the fall in the petroleum revenue bouyancy in the economy. Other than increasing the rates on Corporate and Personal taxation, they thought that they could also reform the indirect taxes by broadening the base and raising their rates. This makes Value-Added Tax an attractive prospect. Currently, the Treasury is seriously considering the conversion of the present Sales and Services tax system into a total Value-Added Tax system. They are convinced of the superiority of the latter instead of the Manufacturing Sales tax system.

\textsuperscript{4} based on the Income type proposed and chosen for Malaysia.
\textsuperscript{5} such as beverage, filtered petroleum, petroleum gas, oils, cigarettes, cars, television and other goods.
\textsuperscript{6} such as hotels, restaurants, bars, coffee houses, night clubs, cabarets, health centers, massage parlors, private houses and barber shops.
system of indirect taxation to the present one for raising the additional tax revenue needed and to achieve greater efficiency while correcting the income distribution in the Commodities taxes system.

However the Treasury is skeptical about the immediate impact of Value-Added Tax on the economy especially on price levels if it is to be implemented\textsuperscript{7}. It has often been argued that a Value-added tax system could cause prices of goods and services to sky-rocket in the market. This was derived from the basic premise that as the tax is imposed on consumers instead of producers, all potential tax burdens would be borne by the consumers. This would result in increased prices of goods and services in the economy by the whole amount of the tax imposed\textsuperscript{8}.

6.2. BASIC DRAWBACKS OF THE PRESENT MANUFACTURERS SALES TAX SYSTEM

To begin the discussion on indirect taxes, a review of the performances of the current Manufacturing Sales tax system by particularly outlining its drawbacks and weaknesses is in order. The present Sales tax imposed at the manufacturers level in Malaysia has several obvious as well as hidden shortcomings that are summarized as follows:

\textsuperscript{7} As this is a very crucial point for politicians, especially after learning from the experience of Indonesia and partly, the Phillipines.
\textsuperscript{8} The tax here could be regarded as direct taxes on consumers which could not be shifted anywhere else.
* TAX REVENUE PRODUCTIVITY

The Sales tax system is relatively less productive for several reasons. First, the tax is imposed at the stage most removed from the final consumer. This means the yield is significantly lower\(^9\). Secondly, the potential tax base is eroded by the overgenerous use of exemptions for various purposes. It was estimated that more than 75% of domestic manufacturers' production and import are currently exempted. Thirdly, effective tax rates are much too low (less than 2%). In terms of Tax effort ratio, the tax only generated tax revenue equivalent to about 1.5% of the Gross Domestic Product, lower than the effort ratio attained by neighboring countries like Thailand, Indonesia and the Philippines.

* EFFICIENCY AND RESOURCES ALLOCATION

The manufacturing Sales tax is being exposed to a possible cascading effect causing prices to snowball each time the goods pass through another stage in the manufacturing process, making manufacturing costs less competitive. This would result in higher prices faced by the final consumers. The tax also result in the taxation of input on exported goods which results in a fundamental distortion in the economy. As the tax is being imposed at the most remote stage from the final consumer, it tends to distort the channels of distribution and encourage evasion. This price differentiation occurred merely as a result of the number of stages a product passes in the manufacturing process or distributional channels.

\(^9\) Compared to that of a tax imposed at the wholesale or retail level. The tax only accounts for about 7.7% of the total tax revenue compared to 21% in Thailand and 25.7% in Korea.
The exemption limit provided on the establishment with an annual turnover of less than M$ 1,000,000 also resulted in another form of distortion as it encouraged firms to operate in a small scale or to break the operation into a small size each to avoid paying the tax. Tax evasion is rampant by diverting materials purchased free of tax to private ends for use by unlicensed manufacturers\(^{10}\).

\* EQUITY OR TAX BURDEN DISTRIBUTION PROBLEMS:

The tax failed to achieve horizontal equity in the tax burden distribution as the burden could not be confined to the final consumer, considering that the tax element on purchases varies with the different production stages of goods or services. As a result, the tax is also not neutral between the poor and the rich. In terms of vertical equity, the tax failed because many non essential goods\(^{11}\), were exempted from the tax base, and most luxury items were not subjected to a higher tax rate. As a result, such structures benefited the middle and higher income groups at the cost of vertical equity.

6.3. BACKGROUND OF VALUE ADDED TAXES

The concept of Value-Added Tax was first suggested by Professor Carl Shoup as part of his reform recommendation for Japan in 1948 (see Jenkins, 1989)\(^{12}\).

\(^{10}\) manufacturers who possess a turnover of less than M$ 100,000. p.a.

\(^{11}\) Defined in relation to the patterns of consumption of the poor.

\(^{12}\) It was however not implemented there until forty years later. The first introduction of a comprehensive form of Value-Added tax happened in the late 1960's when Uruguay
Value-added tax was said to be one of the few fiscal innovations that has rapidly spread worldwide since 1950 (Gillis, Shoup and Sicat, 1987). According to the 1986 World Development Report of The World Bank, by 1986 there were 60 nations who used Value-Added Tax in one form or another within which about 40 nations were developing countries. It was Brazil who introduced the Consumption type of Value-Added Tax which has since been adopted as the standard system known as the European Community model of Value-Added Tax. The tax was less successful in Africa, the Middle East and Asia. In Asia, only four countries implemented some form of Value-Added Tax. In Latin America and the Caribbean on the other hand, the tax was widely adopted.

6.4. ISSUES IN VALUE ADDED TAXES

We must study the common nature or character of the feasible Value Added taxes to be adopted before we can consider venturing into a particular Value Added tax system. There are 570 nominally possible combinations of the tax identified by Shoup (1973). Some of these are described below.

and Brazil adopted the tax in 1965 and 1967 respectively. This was followed by France and Denmark in 1968. Other countries in Europe like Britain (in 1974), Belgium and the other EEC members had followed suite.

13 The model was nicknamed as an EEC "type", as it is made as a prequalification for membership into the body.

14 Only Taiwan and Korea adopted the comprehensive type of VAT.

15 with more than 16 countries currently employing the comprehensive type of VAT.
* TAX BASE DEFINITION

There are at least three basic tax bases that could be used. First, is the popular 'consumption base' that imposes tax on all domestic consumption but excludes investment and intermediate goods. Second, is the 'income base' that imposes tax on both domestic consumption and domestic investment but excludes intermediate goods. Third, is the 'gross income base', which for economic reasons was never considered at all.

Most countries have adopted the consumption type of Value Added Tax because of its proven consonance with fiscal objectives from the point of view of tax administration and compliance. Consumption type VAT was sought to be neutral in resource allocation (Gillis, Shoup and Sicat, 1987). Indonesia, for example, chose the Consumption type of VAT because it was considered to be neutral with respect to factor choice. It does not distort the choice between labour intensive and capital intensive techniques in the production system (Ridwan, 1988).

There are at least four countries (namely, Argentina, Peru, Turkey and Morocco) who have chosen the Income type of VAT over consumption type. The most crucial problem in implementing the Income type of VAT is the need to compute depreciation in arriving at the net investment (McLure, 1987). Some scholars argued that in countries where income tax is considered impracticable for administrative and compliance reasons, an income type of Value Added Tax system could help strengthen the whole tax system.
Another problem related to the issue of double taxation of savings that occurs under the income type of VAT. Income would be taxed now when it is created and again in future when it is spent in the form of consumption. Conrad (1987) was bold in suggesting that consumption of housing should be included in the Value-Added Tax base. He recommended that VAT be imposed on the stock of housing values rather than on the flow of housing services. He argued that this would fully tax the present value of the flow of consumption services from housing. In practice here, VAT would be levied upon all sales of all real estate with credits for VAT paid on real estate purchases.

The above method was considered attractive on economic efficiency, revenue generation and equity grounds to merit serious exploration by scholars (Gillis, Shoup and Sicat, 1987). Problems such as how to treat housing already in existence when the tax is introduced must, however, be given serious consideration.

* LEVEL OF TAXES AND ESTABLISHMENT AFFECTED

Most countries chose the comprehensive form of VAT. The pre-retail taxes have inherent distortions, as happened, currently under the Malaysian Manufacturing Sales tax system described above. These pre-retail systems still exist in a few well developed countries such as Australia, Canada and Switzerland. In the less developed countries, pre-retail taxes had to exist for
administrative and compliance reasons. Indonesia, for example, levied VAT at the manufacturers or producers level with the exception of VAT on petroleum products.

The pre-retail VAT could be a first step towards the comprehensive VAT and can be a good training ground or preparatory stage. It has been proven by the Indonesian case that the mere conversion from the Manufacturers Sales tax to Manufacturers level Value Added tax yielded substantial improvements in tax revenue.

* NEUTRALITY AND THE UNIFORM TAX RATES:

Even though there are some minority countries that adopted the multi-rate Value Added Tax, it is generally believed that a uniform taxation on all current consumption expenditures is required especially under the consumption-type VAT. However full neutrality is recognized as impossible even when fervently desired. To minimize the adverse economic efficiency effects, we need to apply uniform tax rates to the broadest possible base. This implies the limited use of both exemptions and zero rating probably for income distribution and administrative reasons. It was also sought that fewer rates would lead to administrative simplicity though it could work otherwise in relation to the type and size of relevant establishments.

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16 In these countries, the retail trade is normally dominated by many small-scale firms with little formal record keeping.

17 Which is levied at the retail level as the petroleum retail industry is considered to be fully developed.
VAT might still be used as a counter-cyclical tool in an economy. This had been practiced in Britain in early 1980's when tax rates was reduced from 10% to 8% to stabilize prices. However, this was however criticized as inefficient since it forced a very large number of traders to alter pricing policies which had substantially increased compliance costs.

In optimal tax theory of the Ramsey type, we need to differentiate tax rates between commodities according to the elasticities of the commodities concerned to maximize economic efficiency in resource allocation. Even though these points merit consideration, the difficulties in measuring the differing elasticities make the subject matter less relevant in the case of VAT.

* ZERO RATING VS EXEMPTION

In the case of establishments, exempting the entire firms is preferable to zero rating. This is because where an establishment had been exempted, it will not have VAT and is not eligible to claims credits or relief. In the case of particular commodities such as foods, investments and financial services however, zero rating is preferable as it would be easier and superior on economic and income distribution grounds. It would however entails tax refunds to the firms which could sometimes be troublesome. Most countries, including the EC members, employ these methods of exemption and zero rating in their VAT system.

* TRANSITIONAL PROBLEMS

As in any other change or innovation, many issues relating to the transitional process need to be carefully considered especially those related to equity and
economic efficiency problems. This includes addressing cases such as firms buying inputs under turnover tax and selling the resultant products under a VAT and likewise purchase of capital goods before VAT was implemented. There are some other issues relating to the introduction of VAT, such as administration which must be addressed: including destination principle and border tax adjustments, lead time for implementation, government services, issues of used goods, non profit activities and other details procedures on the operation of VAT.

6.5. POSSIBLE INTRODUCTION OF THE MALAYSIAN VALUE ADDED TAX SYSTEM

Our analysis will be focused on the effect and impact of the introduction of Value-Added Tax in the economy as an alternative to the General Sales tax system. A comparison is made between the two systems in order to observe the different effects they produced. A conclusion is then drawn as to which of the two systems is preferable for the Malaysian economy.

The Value-Added Tax system to be introduced will be based on either 'the Income-type Value-Added Tax' structure\(^\text{18}\), the 'consumption type of VAT' (EEC model) which exempts investment goods, or the latest version, contemplated by the EEC countries which is "consumption in nature but includes food items as the base". Note that all VAT models currently zero-rate food items as a crucial feature. In our model, we also exempted foods from the tax base in the first two options and fully

\(^{18}\) Which imposed a uniform rate tax base comprised of both domestic consumption of goods and services and domestic investment demand but excluding intermediate demand.
taxed them at the full rate of 15% in the third case. We had set a 40% tax rate on beverage and tobacco. Primary commodities were excluded from the system\(^{19}\). Excise tax on petroleum products will continue and petroleum is therefore excluded from the tax base under the Value Added tax system. For the remaining goods and services, we fixed a uniform rate of 15%

6.6. METHODOLOGY OF ANALYSIS

As our model could only capture the impact of Marginal tax change analysis, some alteration and modifications need to be made on the data and mode of the analysis. In order to make a complete and meaningful analysis, different benchmark data sets need to be constructed by altering the Malaysian economic position into assuming that Value-Added Tax system is already in existence instead of the current Manufacturing Sales tax system.

We started with the benchmark data set used in the General Sales tax analysis described in chapter four. Since for that benchmark equilibrium Sales tax was imposed on the producers, we presumed that taxes had been suffered proportionally by the consumers (in the final market) and the producers (in the input or intermediate goods market). This is, of course, assuming that there is no proper system of rebate or duty drawbacks on the input taxes\(^{20}\). It is also assumed that Sales taxes are only

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\(^{19}\) As the present producers' tax will be continued under its existing format.

\(^{20}\) The ring system in operation in Malaysia which allows for some rebate of input taxes, was described as inefficient, causing a serious cascading effect in the economy.
being borne by private households. Public and foreign sectors are exempted from paying these tax for efficiency reasons. We therefore started with this assumption following the approach used by Ahmad and Stern (1987).\(^{21}\)

\(^{21}\) Under the present Sales tax on manufacturers products, the tax base is:

\[ g^P = d(p + \tau) + v; \]

while under the Value-Added tax system, the tax base will be:

\[ g^V = d\rho + v \]

The tax difference will be:

\[ g^P - g^V = d\tau \]

where

- \( g^P \) - Manufacturers Sales tax base
- \( g^V \) - Value added tax base
- \( d \) - Vectors of input output costs
- \( \rho \) - Producers prices
- \( v \) - Factors input (Value added) costs
- \( \tau \) - Tax rates

The tax on the firms sector could therefore be decomposed into two parts:

\[ \tau_y = \tau_\delta + \tau_d\gamma \]

where

- \( \tau_y \) - Taxes on firms
- \( \tau_\delta \) - Taxes on final demand
- \( \tau_d\gamma \) - Taxes on intermediate goods

The Value-Added tax system should impose a rate which take into account both the portion of taxes imposed on the final consumers and firms on their input purchased in order to be comparable with that of Sales taxes in terms of revenue generation.

The Value Added tax rates (VAT\(^\pi\)) should then be:

\[ \tau + (g^Pg^V) = \tau + d\tau \]
We first made an attempt to separate the two portions of Producers taxes using the Input-output Tables of the economy in 1988 as a base. To redistribute the taxes to producers and consumers, we added up the total consumption of all firms and private households and allocated total taxes on each commodities proportionally based on the individual consumption figures of each group. This gave us the distribution between the input and final goods taxes as shown in Table 6.1.

---

22 With the help of spread sheet analysis.
### DECOMPOSITION OF SALES TAX INTO FINAL GOOD TAX AND TAXES ON INPUTS

( in $'000 )

<table>
<thead>
<tr>
<th></th>
<th>Final goods tax</th>
<th>Input tax</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taxes on food</td>
<td>95.532</td>
<td>51.557</td>
<td>147.094</td>
</tr>
<tr>
<td>Taxes on beverage and tobacco</td>
<td>1,043.427</td>
<td>87.262</td>
<td>1,130.690</td>
</tr>
<tr>
<td>Taxes on clothing and footwear</td>
<td>38.453</td>
<td>121.551</td>
<td>160.004</td>
</tr>
<tr>
<td>Taxes on manufacturing durables</td>
<td>433.174</td>
<td>498.452</td>
<td>931.626</td>
</tr>
<tr>
<td>Taxes on Households services</td>
<td>25.187</td>
<td>79.942</td>
<td>105.129</td>
</tr>
<tr>
<td>Taxes on Investment goods</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Taxes on Other goods</td>
<td>475.830</td>
<td>2,157.049</td>
<td>2,632.880</td>
</tr>
<tr>
<td>Taxes on Petroleum</td>
<td>220.212</td>
<td>1,563.788</td>
<td>1,784.000</td>
</tr>
<tr>
<td>Taxes on primary commodities</td>
<td>19.613</td>
<td>245.388</td>
<td>265.000</td>
</tr>
<tr>
<td>Total</td>
<td>2,351.428</td>
<td>4,804.989</td>
<td>7,156.418</td>
</tr>
</tbody>
</table>

Source: Manipulated from the benchmark data sets.

We then vertically summed the individual tax figures on the firms sector to determine the tax that would have been absorbed by each firm as input tax and the rest is assumed to have been imposed on the final consumers. The allocation between the input and the output taxes is shown in Table 6.2.
### TABLE 6.2.

SEGREGATION OF VALUE ADDED (EQUIVALENT) TAXES INTO INPUT AND FINAL GOODS TAXES

*(in M$’000)*

<table>
<thead>
<tr>
<th></th>
<th>Final goods tax</th>
<th>Input tax</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taxes on foods</td>
<td>95.532</td>
<td>282.580</td>
<td>378.113</td>
</tr>
<tr>
<td>Taxes on beverage and tobacco</td>
<td>1,043.427</td>
<td>70.747</td>
<td>1,114.174</td>
</tr>
<tr>
<td>Taxes on clothing and footwear</td>
<td>38.453</td>
<td>123.083</td>
<td>151.536</td>
</tr>
<tr>
<td>Taxes on manufacturing durables</td>
<td>433.174</td>
<td>455.302</td>
<td>888.475</td>
</tr>
<tr>
<td>Taxes on Households services</td>
<td>25.187</td>
<td>377.352</td>
<td>402.539</td>
</tr>
<tr>
<td>Taxes on Investment goods</td>
<td>0</td>
<td>1,320.789</td>
<td>1,320.789</td>
</tr>
<tr>
<td>Taxes on Other goods</td>
<td>475.830</td>
<td>348.615</td>
<td>824.446</td>
</tr>
<tr>
<td>Taxes on Petroleum</td>
<td>220.212</td>
<td>714.934</td>
<td>935.146</td>
</tr>
<tr>
<td>Taxes on Other services</td>
<td>0</td>
<td>417.028</td>
<td>417.028</td>
</tr>
<tr>
<td>Taxes on Primary commodities</td>
<td>19.613</td>
<td>704.559</td>
<td>724.173</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2,351.428</strong></td>
<td><strong>4,804.989</strong></td>
<td><strong>7,156.418</strong></td>
</tr>
</tbody>
</table>

Source: Manipulated from the benchmark data set.

The input taxes were then distributed to the private households groups based on their consumption of each of the goods and services. This resulted in the following tax burden distribution as in Table 6.3 below.
| TABLE 6.3. |
| TAX BURDEN DISTRIBUTION UNDER THE VALUE ADDED TAX SYSTEM |
| ( IN M$ MILLIONS ) |
| | Inf. lab. | Low Inc. | Med. Inc. | High Inc. | Top bkt. | Entrp | Total tax | Effect. tax rate |
| FOOD | 133 | 72.5 | 54.9 | 70.9 | 29.8 | 17.3 | 378.11 | 2.5354 |
| BEV. & TOBB. | 331 | 237.1 | 178 | 221 | 92.9 | 54.1 | 1114.2 | 37.489 |
| CLOTH. & FWR. | 38.3 | 29.8 | 22.7 | 36.5 | 15.3 | 8.92 | 151.54 | 33.024 |
| MFG. DURABLES | 167 | 149.1 | 143 | 258 | 108 | 63.1 | 888.48 | 10.705 |
| HSLD.SERVICES | 78.1 | 59.2 | 52.3 | 128 | 53.7 | 31.3 | 402.54 | 16.730 |
| INVSTMNT.GOODS. | 313 | 218 | 185 | 363 | 152 | 88.7 | 1320.8 | 10.338 |
| OTHER GOODS | 209 | 154 | 134 | 263 | 64.3 | .676 | 824.45 | 13.516 |
| PETROLEUM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| OTHER SERVICES | 72 | 76 | 351 | 622 | 261 | 152 | 417.03 | 3.0117 |
| PRIMARY COMM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL | 1341 | 995 | 1121 | 1962 | 477.4 | 416.2 | 7156.42 | |
| % OF NET INCOME | 8.73 | 8.70 | 11.3 | 11.5 | 6.40 | 5.249 | 10.345 | |

Source: Manipulated from the benchmark data sets.

In the case of the tax element on foods, petroleum and primary commodities, further comments need to be made. Under the new Value-Added Tax system\(^\text{23}\), foods items will be exempted from the tax system. The tax had therefore been included in the system only to balance the accounts. Its effect will be erased from the result in the detailed analysis by not adding the impact to the total Value-Added Tax. Taxes suffered by the primary commodities and petroleum industries in the course of purchasing raw materials were added to the primary commodities taxes and excise taxes respectively to

\(^{23}\) To be discussed later.
balance the accounts (which is outside the scope of Value-Added Taxes). Taxes suffered by the investment goods and the other services' industries were only indirect through input taxes, as under the General Sales taxes system, there were no commodities taxes on these items.

As a result of data manipulation, total tax collection by the Treasury remained the same as under the General Sales taxes. The benchmark data set was marginally altered to reflect changes in the tax incidence between goods as a result of the tax allocation procedures shown above. Only certain data on the public sector and foreign households was marginally altered marginally to balance the accounts. The adjustments are shown in Table 6.4.
## TABLE 6.4.
ADJUSTMENTS MADE ON THE PUBLIC AND FOREIGN SECTS. CONSMPT

( in M$ MILLION )

<table>
<thead>
<tr>
<th></th>
<th>Public sector Original</th>
<th>New</th>
<th>Foreign sector Original</th>
<th>New</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food</td>
<td>282.28</td>
<td>513.30</td>
<td>2851.40</td>
<td>2851.40</td>
</tr>
<tr>
<td>Bev. &amp; Tobacco</td>
<td>16.40</td>
<td>16.40</td>
<td>83.10</td>
<td>66.58</td>
</tr>
<tr>
<td>Cloth. &amp; Footwear</td>
<td>45.62</td>
<td>37.15</td>
<td>3829.50</td>
<td>3829.50</td>
</tr>
<tr>
<td>Manufact. Durables</td>
<td>2813.00</td>
<td>2769.85</td>
<td>15665.70</td>
<td>15665.70</td>
</tr>
<tr>
<td>Households service</td>
<td>631.63</td>
<td>929.04</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Invest. goods</td>
<td>5128.01</td>
<td>6448.79</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Other goods</td>
<td>1451.48</td>
<td>143.05</td>
<td>1708.30</td>
<td>1208.30</td>
</tr>
<tr>
<td>Petroleum</td>
<td>221.93</td>
<td>521.09</td>
<td>6928.20</td>
<td>6928.20</td>
</tr>
<tr>
<td>Other services</td>
<td>719.16</td>
<td>2253.55</td>
<td>210.10</td>
<td>210.10</td>
</tr>
<tr>
<td>Prim. commodities</td>
<td>5.41</td>
<td>531.59</td>
<td>25627.55</td>
<td>25627.55</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>11314.9</strong></td>
<td><strong>14163.79</strong></td>
<td><strong>56903.85</strong></td>
<td><strong>56627.55</strong></td>
</tr>
</tbody>
</table>

Source: Comparison of the benchmarks data with the new one.

In the case of foreign households, only the consumption figures for beverage and tobacco and other goods was altered. Consumption was marginally reduced in the former case. In the case of other goods, a significant decrease in consumption was shown. The same phenomenon occurred in the case of public sector consumption. Public sector consumption was altered to balance the accounts horizontally. As tax revenue collected by the Treasury was expected to increase tremendously under the Value Added Tax system, the increase in public sector consumption was justifiable.
Data sets on the new benchmarks equilibrium were fitted into the input data of the model for a re-run. The result was used to project the implication of the introduction of a Value-Added Tax system. Some other data manipulation will be necessary before the data can be interpreted.

As the new Value-Added Tax system will be different in terms of rates structures, we need to make some adjustment to the result to reflect the new structures as described earlier. We need to increase tax rates on most of the goods and services. The following adjustment as shown in Table 6.5 were made on the rates:

<table>
<thead>
<tr>
<th>TAX RATES ADJUSTMENTS ON VALUE ADDED TAXES (in percentages)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present rates on Sales tax</td>
</tr>
<tr>
<td>----------------------------</td>
</tr>
<tr>
<td>Tax on Food</td>
</tr>
<tr>
<td>Tax on Bev.&amp; Tob.</td>
</tr>
<tr>
<td>Tax on Cloth.&amp; Fw.</td>
</tr>
<tr>
<td>Tax on Mfg.Durbles.</td>
</tr>
<tr>
<td>Tax on Hsld.Serv.</td>
</tr>
<tr>
<td>Tax on Invst.goods.</td>
</tr>
<tr>
<td>Tax on Other goods.</td>
</tr>
<tr>
<td>Tax on other serv.</td>
</tr>
</tbody>
</table>

Source: Compiled from the analysis and assumptions.
In the third model of Value-Added Tax system, where we tax food items at the full rate (uniform with the other goods taxed in the system), the tax rates increased by 12.4646% (15.0 - 2.5354).

We started with the results of absolute changes in the tax instruments. We then adjusted the effect by applying the relevant tax rates on the figures showing the impact of 1% increased in the tax rate. By doing this we actually attempted to show the impact of introducing the Value-Added Tax impact at the desired uniform rates. The results showed the marginal effect of changes from the General Sales taxes to the Value-Added Tax system.

Bear in mind that basic data was obtained from an analysis of a marginal change in the tax instruments. Data showed the impact of a 1% increase in the tax rate of each of the tax instruments. Here we stretched the argument about marginal analysis a little further by assuming that the result is also relevant in the case of relatively greater changes in the tax instruments.

As the effect of introducing Value-Added Taxes could only be measured meaningfully by summing up the effect of individual changes in the tax instrument under the new tax system, we horizontally summed all the effects of tax instrument changes on each of the goods and services. The result is a set of figures showing the total marginal effect of tax instrument changes.

We obtained three results of summation based on the three different models of a Value-Added Tax system selected in the study; first with investment goods included in the base, but with zero rated foods items (referred to as The Income type VAT), second, without
investment goods in the tax base and zero rating of food items (referred to as the Consumption type of VAT), and thirdly, without investment goods but food items to be included in the base (referred to as the pure consumption type of VAT).

6.7. BASIC VALUE ADDED TAX STRUCTURES IN MALAYSIA

Before going further into the comparison of the two tax systems, it would be helpful to briefly discuss the basic picture of the two tax system from the benchmarks data set provided (The income type of VAT basis is being used for comparison here).

A. EXPECTED TAX REVENUE CHANGES

The first column in Table 6.6 illustrated the tax collected under the Manufacturing Sales tax system in 1988. The figures were extracted from the original benchmark data set used in the earlier model.

The second column has tax collected under the Value-Added Taxes assuming that total tax collected remains constant after the conversion. The difference in tax incidence for each industry between the two tax systems reflects the extent of input taxes accumulated into the final goods. The third column could be interpreted as the expected additional tax revenue under the new Value-Added Tax system, taking into account the changes in the tax rates on each good and service. The figures were obtained simply by inflating or deflating...

---

24 This is extracted from Table 6.3 and completed.
25 The figures were obtained by tracing the input taxes on industry and adding taxes imposed on the final consumers.
the figures on the second column in accordance with relevant tax rate changes as shown in Table 6.6.

Except for clothing and footwear and households services, all other taxes in the Value Added Tax system were expected to generate some additional tax revenue because the tax rates had been increased in each cases. The total tax revenue from commodities taxes was expected to increase by about 26.85%. If food items would be fully taxed at 15% rate, the new tax revenue from food items will be about M$ 723.147 millions. Exempting investment goods under the consumption type of VAT mean, M$ 1,916 millions of tax revenue had to be forgone (compared to the income type of VAT).
### TABLE 6.6.

**TAX COLLECTED UNDER THE TWO TAX SYSTEM**

( IN M$ MILLION )

<table>
<thead>
<tr>
<th></th>
<th>G.S.T system</th>
<th>V.A.T system (equilnt)</th>
<th>V.A.T system (new)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taxes on foods</td>
<td>147.094</td>
<td>378.113</td>
<td>0</td>
</tr>
<tr>
<td>Taxes on beverage and tobacco</td>
<td>1,130.690</td>
<td>1,114.174</td>
<td>1,188.801</td>
</tr>
<tr>
<td>Taxes on clothing and footwear</td>
<td>160.004</td>
<td>151.536</td>
<td>68.830</td>
</tr>
<tr>
<td>Taxes on manufacturing durables</td>
<td>931.626</td>
<td>888.475</td>
<td>1,244.944</td>
</tr>
<tr>
<td>Taxes on Households services</td>
<td>105.129</td>
<td>402.539</td>
<td>360.914</td>
</tr>
<tr>
<td>Taxes on Investment goods</td>
<td>0</td>
<td>1,320.789</td>
<td>1,916.409</td>
</tr>
<tr>
<td>Taxes on Other goods</td>
<td>2,632.880</td>
<td>824.446</td>
<td>914.967</td>
</tr>
<tr>
<td>Taxes on Petroleum</td>
<td>1,784.000</td>
<td>935.146</td>
<td>935.146</td>
</tr>
<tr>
<td>Taxes on Other services</td>
<td>0</td>
<td>417.028</td>
<td>2,077.015</td>
</tr>
<tr>
<td>Taxes on Primary commodities</td>
<td>265.000</td>
<td>724.173</td>
<td>724.173</td>
</tr>
<tr>
<td>Export taxes</td>
<td>1,315.000</td>
<td>1,315.000</td>
<td>1,315.000</td>
</tr>
</tbody>
</table>

Total commodities taxes | 8,471.419 | 8,471.419 | 10,746.199

Source: Original benchmark data set and new data set.

### B. EXPECTED TAX BURDEN DISTRIBUTION

A common misconception normally arises from the basic premise about the tax incidence distribution under the Value-Added Tax. If we just observed the direct and immediate tax incidence as shown in Table 6.7, misinterpretation would occur as to the effect of a Value-Added Tax system on the economy. General sales tax
on manufacturers was seen to be a more favorable system as far as the households were concerned since it would never affect households directly. The tax only affects producers who are always assumed to absorb the whole tax burden. The market price of goods and services would therefore be immune to by the taxes. Value-Added Taxes, on the other hand, were seen as taxes on the final consumers and would therefore immediately caused market prices to rise, assuming no tax shifting occurs.

As shown in Table 6.7 below, Value-Added Tax burdened the households group at an average effective rate of more than 8% of income. An interesting aspect to observe is that, the effective tax rates were quite high, perhaps as high as the effective rates on income taxes. Furthermore the rates were regressive at the top; entrepreneurs paying much lower rates than the informal labours. It will be interesting to observe the actual position of tax incidence and distributions from the results of the general equilibrium analysis to be discussed later.
TABLE 6.7.

TOTAL DIRECT VALUE ADDED TAXES (INCOME TYPE)
SUFFERED BY EACH CLASSES OF HOUSEHOLDS
(in $'000)

<table>
<thead>
<tr>
<th></th>
<th>Total income</th>
<th>V.A.T imposed</th>
<th>Effective tax rate on incm.in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Informal labors</td>
<td>15,359.6</td>
<td>1,341.0</td>
<td>8.73</td>
</tr>
<tr>
<td>Low income groups</td>
<td>11,433.1</td>
<td>995.0</td>
<td>8.70</td>
</tr>
<tr>
<td>Medium income groups</td>
<td>9,905.1</td>
<td>1,121.0</td>
<td>11.30</td>
</tr>
<tr>
<td>High income groups</td>
<td>17,100.6</td>
<td>1,962.0</td>
<td>11.50</td>
</tr>
<tr>
<td>Top mgmt. groups</td>
<td>7,452.7</td>
<td>477.0</td>
<td>6.40</td>
</tr>
<tr>
<td>Entrepreneurs</td>
<td>7,928.6</td>
<td>416.2</td>
<td>5.25</td>
</tr>
</tbody>
</table>

Source: Estimated based on the benchmark data sets.

6.8. RESULT OF THE GENERAL EQUILIBRIUM ANALYSIS

A. PROJECTED IMPACT ON MARKET PRICES

Table 6.8 below was constructed by summing all the effects of changing to Value-Added Tax on each of the tax instruments and after applying the present effective rates of VAT\textsuperscript{26} discussed earlier. Three sets of data were obtained. In the first column is data on the Income-type

\textsuperscript{26} as described in column two of Table 6.7.
of VAT. The second set of data shown in the second column, is the price impact of the Consumption type of VAT. Notice that the effect on investment goods was excluded in this case. The third case shown in the third column, is data on the Consumption type VAT with food items included in its base. The data therefore encompassed all effects shown in the second column plus the effect of the tax on food.

The Table above shows two stages conditions under the new Value-Added Tax system. First, is the situation immediately after we adopted the Value-Added Tax system which generates exactly the same amount of tax revenue as the Manufacturing Sales tax described in Table 6.6. This would present the net changes in prices after the conversion into the Value-Added Tax system. The second situation is where the tax rates for each of the Value-Added Tax instruments was adjusted to make them more uniform. Separating the two situations would enable us to predict the impact of the Value-Added Tax introduction at two stages or two different assumptions. The set of figures after taking into account the tax rates adjustment was calculated by taking into account

27 Which encompassed the effect of changes in VAT on food, beverages and tobacco, clothing and footwear, manufacturing durables, household services, investment goods, other goods and services as the element of Value-Added Taxes which is income-based.

28 Which encompassed the effect of changes of VAT on food, beverage and tobacco, clothing and footwear, manufacturing durables, household services, other goods and services as the element of Value-Added taxes which is consumption in nature.
the rate of price changes\textsuperscript{29} and the change in the tax rates specified.

The analysis above attempts to gauge the price or inflationary impact of the introduction of a Value-Added Tax system. It must however be stressed that the model could only account for 'relative' instead of 'absolute' prices. It would therefore be unable to gauge the potential inflationary impact effectively. The impact on relative price could nevertheless reflect this potential impact on the price change as a result of the introduction of a Value-Added Tax system.

\textsuperscript{29} We used the aggregate of price changes recorded as a result of the 1\% increased in the tax rates of each of the tax instruments. We took the percentage change in the price change for each good as a result of the Value Added tax introduction. We then multiplied the tax rate adjustment required by the percentage above. The product was added to the result of the price changes under the present tax rates as shown on the 'before change' column in Table 6.8.

\[ PAATR = ( (1 + \rho) \times TRC ) + PCAPR \]

where

- \( PAATR \) - Prices at the adjusted tax rate
- \( \rho \) - aggregate prices change from the 1\% tax rate increased
- \( TRC \) - Tax rates changes.
- \( PCAPR \) - Price changes at present tax rates.
### TABLE 6.8

**CHANGES IN THE NET PRICES OF CONSUMERS GOODS UNDER THE VALUE ADDED TAX SYSTEM**

(IN PERCENTAGE)

(based on present and the new tax rates)

<table>
<thead>
<tr>
<th>Inc.type V.A.T</th>
<th>Consmpt. V.A.T</th>
<th>Consmpt.w.food</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Before</strong></td>
<td><strong>After</strong></td>
<td><strong>Before</strong></td>
</tr>
<tr>
<td></td>
<td>rt.chg</td>
<td>rt.chg</td>
</tr>
<tr>
<td>Foods</td>
<td>-.0090</td>
<td>-2.2824</td>
</tr>
<tr>
<td>Bev.and tobacco</td>
<td>.3287</td>
<td>2.5745</td>
</tr>
<tr>
<td>Cloth. &amp; F.Wear</td>
<td>-.1791</td>
<td>-17.766</td>
</tr>
<tr>
<td>Mfg.durables</td>
<td>-.2608</td>
<td>4.2031</td>
</tr>
<tr>
<td>Hsld.services</td>
<td>.5118</td>
<td>-1.7971</td>
</tr>
<tr>
<td>Investment goods</td>
<td>.0157</td>
<td>4.6723</td>
</tr>
<tr>
<td>Other goods</td>
<td>-.0670</td>
<td>1.4772</td>
</tr>
<tr>
<td>Petroleum</td>
<td>.2742</td>
<td>0.2742</td>
</tr>
<tr>
<td>Other services</td>
<td>.5207</td>
<td>12.4594</td>
</tr>
<tr>
<td>Prim.commodities</td>
<td>-.5196</td>
<td>-0.5196</td>
</tr>
</tbody>
</table>

Source: Compiled from the results of the G.E. analysis.

As shown in Table 6.8, the impact of a conversion into the Value-Added Tax was mild. The figures that show the impact of a mere conversion into the Value-Added Taxes\(^{30}\) are very encouraging. Prices of food, clothing and footwear, manufacturing durables, other goods and primary commodities actually dropped as a result of the introduction of the new Value-Added Tax. This could be

\(^{30}\) Without changing the tax rates of the instruments involved.
explained by the extent of the input taxes contents in the production costs\textsuperscript{31}. In the case of primary commodities for example, the input tax portion was substantial\textsuperscript{32}. Input taxes without a proper system of tax rebate or credit would result in the snowballing of tax and products costs. The elimination of these taxes under the Value-Added Taxes system had alleviated producers from suffering these taxes. They had passed these benefits to the consumers in the market through price reduction. An important outcome of the conversion is the potential improvement in resource allocation and efficiency in the industries.

However, except for the above, prices before the tax rate change of all other goods and services had risen but at relatively mild rates except in the case of household services and other services\textsuperscript{33}. Comparing between the three types of Value Added tax system, we found that the Income type of VAT is more sensitive to price changes\textsuperscript{34}. The consumption type of VAT was the most insensitive. The sensitive nature of Income type VAT could be explained by the substantial portion of input tax in the goods\textsuperscript{35}. The tax on food also affect prices quite substantially as shown from the impact on the VAT system, which also includes food items as its tax base.

\footnotesize
\textsuperscript{31} (as shown in Table 6.1 and 6.2) which cause prices to increase by the same amount.
\textsuperscript{32} Amounting to more than 30 times of the portion of taxes on final consumers.
\textsuperscript{33} Where prices increased by more than 0.5\% each.
\textsuperscript{34} The rate of price change - increase or decrease had been relatively substantial.
\textsuperscript{35} which had been exempt from the Manufacturing Sales tax.
In our assumption, we decided to adjust the tax rates of the new Value Added tax system as shown in Table 6.5. To project the impact of these adjustments in the tax rates, we showed the price changes under these new rates as shown in prices at new tax rates changes. In the case of food, clothing and footwears and household services, the change was positive as prices dropped substantially, because tax rates were reduced in an attempt to make the VAT rates more uniform. The most serious case of a price increase was on the other services, as this item had been excluded from the tax system all together under the Manufacturing Sales tax system.

Most policy makers have been reluctant to switch to a Value-Added tax system because of the concern over the potential inflationary effect of such a reform. In the case of Indonesia, the problem was real rather than illusory. The switchover to the VAT system was accompanied by increases in the general price level. Price indices had in fact started to register some substantial increases even before its introduction, as a lot of last minute buying and stocking up occurred (Ridwan-1988). Although it was qualified that the impact of VAT on general price level is part and parcel of its transitional phase; it was more of a one shot deal which tends to disappear once the tax has been enforced for a period of time. The initial reaction was probably caused by a misreaction of sellers who were confused on how the credit mechanism works and accordingly attempted to pass on the additional administrative costs of VAT to consumers in the form of higher prices (Ridwan, 1988).

The introduction of Value-Added Tax has on occasion had a once-and-for-all impact on the price level, but has never caused a continuing upward spiral of prices.
(Gillis, Shoup, Sicat, 1987). Tait (1987), who studied 35 countries which had adopted Value-Added Tax, observed a little price movement during the periods immediately before and immediately after the adoption of VAT. In 22 of the countries, the introduction of VAT had not lead to a major price increase. In the other 8 countries, the introduction of a VAT was associated with a rise in the consumer price index, but there were a once and-for-all shift.

As can be seen from the Table and discussion earlier, we could avoid immediate increased in the market prices by sticking at the present tax rates. By maintaining the tax rates we can also expect at least the same tax yield from the new tax system. But, there are limits to this option. A study in the USA in 1984, for example, indicated that VAT is not a tax to impose at low rates because of the additional investment in tax administration that would be required prior to and during the first few years of its introduction. In general, an initial base rate lower than 7% would not make the introduction of comprehensive VAT worthwhile (Gillis, Shoup and Sicat, 1987).

Sandford (1986) concluded from his studies that start-up costs of VAT in the first 2-3 years of application are very high. For Britain, the operating cost of VAT was estimated to be approximately 11% of VAT revenue in 1977 (three years after its introduction). The cost fell to 6% by 1984-85 as a result of the tax rates increase to 15%. It was concluded that VAT is not a low rates tax system.

36 No significant finding was observed for the rest of the countries.
### TABLE 6.9.

**TAX BURDEN DISTRIBUTION CHANGES AS A RESULT OF CONVERTING TO VALUE ADDED TAXES**

*(IN PERCENTAGE)*

(At marginal rates changes under the New Value-Added Taxes)

<table>
<thead>
<tr>
<th>Incomes type</th>
<th>Inc. type VAT</th>
<th>Consmpt. type VAT</th>
<th>Consmpt. VAT with food</th>
</tr>
</thead>
<tbody>
<tr>
<td>Informal labors</td>
<td>0.8748</td>
<td>2.2095</td>
<td>-5.3925</td>
</tr>
<tr>
<td>Unskilled labors</td>
<td>-0.1236</td>
<td>-0.3552</td>
<td>-2.2518</td>
</tr>
<tr>
<td>Semiskilled labors</td>
<td>-0.5265</td>
<td>-0.1988</td>
<td>-1.7078</td>
</tr>
<tr>
<td>Skilled labors</td>
<td>-1.4493</td>
<td>-0.5398</td>
<td>-2.3593</td>
</tr>
<tr>
<td>Top management</td>
<td>-1.5276</td>
<td>-8.5043</td>
<td>-2.7633</td>
</tr>
<tr>
<td>Entrepreneurs</td>
<td>-1.8838</td>
<td>-0.7024</td>
<td>-3.2704</td>
</tr>
</tbody>
</table>

Source: Compiled from the results of the G.E. analysis.

B. PROJECTED IMPACT ON THE TAX BURDEN DISTRIBUTION
   - A MARGINAL ANALYSIS.

I. METHODOLOGY OF ANALYSIS

The basic figures in percentage as shown in the first column in Table 6.9 were obtained by summing the total real income changes as a result of introducing each tax instrument under the new Value Added tax system at the new Value Added tax rate\(^{37}\). This gave the total

\(^{37}\) The aggregate impact of the 1% increase in each of the tax instruments involved was multiplied by the difference
marginal tax burden of the private sectors. Again, three sets of figures were shown, each projecting the impact of one feasible type of Value-Added Tax system. Here we are only interested in gauging the change in the tax burden distribution as a result of the conversion into the Value Added tax system. This is assuming that the burden distribution at the present tax rates are known. Atkinson's inequality index of one had been applied on these figures and the column total of the weighted total of welfare losses is presented in Table 6.10.

For a more robust analysis, we would attempt to compare the total tax burden distribution under both the Manufacturing Sales tax system and the Value Added tax system at the new tax rates. The figure for an impact of 1% increase in the tax rates for each instrument was inflated by the relevant tax rates specified under the new Value-Added Tax and aggregated horizontally to obtain the total real income changes. The figures of real income changes in percentage were converted into M$ to provide a clearer picture. The same treatment is accorded to the General Sales tax system. The General Sales tax system would be closer to the consumption type of VAT, which includes food in its tax base.

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38 As projected in Table 6.3.
39 Only the weighted total figures (after applying the Atkinson index of one) were presented. The rest of the figures show the actual welfare loss in M$.
40 Except that, under this system, there is no impact on the investment goods tax as the tax does not exist under the system.
41 Because of the nature of the tax instruments available.
II. FINDINGS OF THE ANALYSIS

Under the Manufacturing General sales tax system, no direct impact of taxes occurred on the households sector, simply because taxes are imposed on the firms rather than the households themselves. Under the Value-Added Tax system, a more complex effect is expected, as all tax instruments directly affect each of the households groups.

It is interesting to observe that the informal labour groups experienced some increase in real income while the other income groups experienced real income losses. The three top income groups experienced the largest drop in real income. It is therefore evidenced that the conversion into the Value-Added Tax system resulted in some positive distributive effect on the households groups. This result can be traced to the basic characteristic of this Value-Added Tax system. The informal labour groups consumed relatively more of these goods. We could therefore expect there to be a positive impact.

Juxtaposing between the three possible types of Value-Added Tax systems, we can assert that the consumption type of VAT, which includes food items as its base, is the worst in terms of its erosive effect on the real income of all households groups, especially the informal labour groups. The consumption type of VAT, which zero-rates food items, on the other hand is rated the best tax system of the three.

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42 i.e. exempting food items from the tax.

43 in that it generated some substantial welfare gains to
ANALYSIS USING THE ATKINSON'S INEQUALITY INDEX

Advancing deeper into the study of income distribution impact of the switch into the Value added tax system, we introduce the Atkinson’s index of Inequality aversion in our analysis. The figures of real income changes under the base case above had been divided by the product of the average income of the particular group divided by the average income of the population.

Four values of inequality aversion were used to show the effect on the weighted average real income as we grew more concerned for the poorest group in the economy. the informal labours group, while at the same time minimised the welfare loss of the other households groups.
As shown from the result in table 6.10 above, at the zero inequality aversion\(^{44}\) the weighted average real income is negative (M$ - 69 millions). However at an inequality aversion of one\(^{45}\), the negative weighted average real income became smaller. These figures turned positive and enlarged as increase concern for the poorest group in the economy mounted. This means that the tax burden distribution resulted from the conversion into the VAT is expected to be quite favourable. We can also

\(^{44}\) Where we are not at all concerned about inequality.

\(^{45}\) Where we begin to show our concern for the poorest group in the economy.
observe the impact on income distribution by referring to total welfare changes at different inequality aversion factors. The figures turned from negative to positive and increased at a rapid rate. This indicates the progressive impact on the tax burden distribution as a result of switching to a Value-Added Tax system.

### TABLE 6.11.

TOTAL TAX BURDEN DISTRIBUTION COMPARISON BETWEEN TAX SYSTEMS

( In M$ MILLIONS )

( At the new Value Added tax rates )

<table>
<thead>
<tr>
<th></th>
<th>MFG. GEN. SALES TAX</th>
<th>Inc.type V.A.T.</th>
<th>Consmp. type VAT</th>
<th>Consmp. VAT with food</th>
</tr>
</thead>
<tbody>
<tr>
<td>Informal labours</td>
<td>-3,992.6</td>
<td>-2,232.9</td>
<td>-1,573.3</td>
<td>-2,740.9</td>
</tr>
<tr>
<td>Unskilled labours</td>
<td>-1,020.2</td>
<td>-710.6</td>
<td>-534.4</td>
<td>-332.5</td>
</tr>
<tr>
<td>Semi-skilled labour</td>
<td>-257.8</td>
<td>-484.9</td>
<td>-380.5</td>
<td>-529.9</td>
</tr>
<tr>
<td>Skilled labours</td>
<td>-2,247.5</td>
<td>-1,478.4</td>
<td>-977.9</td>
<td>-1,289.1</td>
</tr>
<tr>
<td>Top management</td>
<td>-1,373.4</td>
<td>-733.7</td>
<td>-488.3</td>
<td>-656.7</td>
</tr>
<tr>
<td>Entrepreneurs</td>
<td>-3,715.5</td>
<td>-880.7</td>
<td>-579.4</td>
<td>-782.9</td>
</tr>
</tbody>
</table>

Wt.Total welfare costs -12,606.9 -6,521.3 -4,533.9 -6,832.2

Wt.Total welfare loss -5,260.9 -3,062.5 -2,182.5 -3,317.6

Source: Compiled from the results of the G.E.M. analysis.

The weighted total welfare loss figures on the last row of the Table above showed results after taking into account the inequality aversion factor of one.
C. TAX BURDEN COMPARISON BETWEEN THE GST AND THE VAT SYSTEM — A TOTAL ANALYSIS.

I. METHODOLOGY OF ANALYSIS

A total analysis was attempted by aggregating the tax burden experienced by each of the households from each individual tax instrument available in the economy based on the new tax rates. A similar method was applied to arrive at the parallel figures for the manufacturing Sales tax system.

Table 6.11 was constructed under an assumption that the marginal results obtained from the general equilibrium analysis, could be used to stretch the result to reflect the total effect of the tax instruments imposition. Hence, the results must be read cautiously. The last row on the Table shows the total welfare costs after applying the Atkinson inequality aversion factor of one.

II. FINDINGS FROM THE ANALYSIS

It is quite surprising to observe the contrasting distribution picture shown in Table 6.11. In the case of a General Sales tax, the impact on the higher income groups is quite severe. The opposite is true in the case of the three system of VAT. Even though the lowest income group still bears the biggest burden, the extent was relatively small in the Value-Added Tax system. A Value-Added Tax system seems to distribute the tax burden relatively more equitably, especially for the low and medium income groups. The overall distribution impact in the last row of the Table shows the weighted total of welfare loss after applying the Atkinson's inequality index of one. Again, The Sales tax is shown to be inferior to the Value-Added Tax system.
Differences occurred because, in the earlier analysis, we did not take into account the existing burden of the General Sales tax system and also assumed that the burden under the two system at the same tax rates would be the same. Investment goods which had never been taxed before substantially affected the households welfare substantially. This resulted in a high welfare loss under the Income type of VAT, which includes investment as its tax base.

D. PROJECTED IMPACT ON THE EFFICIENCY IN THE ECONOMY

The strongest argument for switching into the Value Added tax system is its efficiency potential. Value-Added Tax is said to be capable of eliminating distortion in the economy created mostly as a result of the snowballing effect and the tax on exported goods. In short it promises higher efficiency in the economy.

I. METHODOLOGY OF ANALYSIS

Efficiency in the economy is measured by the net changes in the real national income. As in the earlier case, net changes in real national income are obtained by summing all changes in the real national income caused by the introduction of each of the tax instruments under the Value-Added Tax at the new rates. The same procedure is carried out on the General Sales figures for comparison purposes.

---

46 Sales taxes and Value-Added taxes.
II. FINDINGS OF THE ANALYSIS

The conversion into the Value-Added Tax resulted in a drop in the real national income. This is true in the case of all the three feasible types of Value-Added Tax system. All instruments in the system generated negative welfare effects. Comparing between the new and the existing tax rates structures, it is evident that under the new rates, the welfare loss is relatively larger. This is because of the increase in tax rates\(^{47}\). In the base case, total welfare loss was recorded at M$ -1,761.57 millions at the new rates.

Comparing between the three possible types of Value-Added Tax systems, the consumption type of VAT, which zero-rates food is the most efficient system of VAT, while income type is the worst system. The different impact was caused by the potential welfare loss generated from taxing investment goods, which is currently exempt from tax.

A more meaningful analysis would contrast the total net real national income resulting from the set of Value-Added Tax with that of the Manufacturers Sales taxes.

Overall, the General Sales tax system generated more welfare losses compared to the effect under all the three feasible types of Value-Added Tax systems. Comparing the present tax rates structures, showed that an immediate switch into a Value-Added Tax system would improve efficiency in the economy to the tune of M$ 778.5 millions. The efficiency improvement would be more

\(^{47}\) with the exception of clothing and footwear, foods, and other goods, where tax rates are reduced.
significant under the Consumption type of VAT\textsuperscript{48}. This increase reflects the distortive impact of the current General Sales tax, as well as the efficiency improvement achieved as a result of unifying the tax rates structures. The smaller efficiency improvement achieved under the Income type of VAT again reflects the relatively offensive nature of the tax on investment goods in terms of efficiency.

E. PROJECTED IMPACT ON TAX REVENUE GENERATION

Revenue generation is an important factor in the decision to switch into the Value Added Tax system. This is because, the system proves to be quite costly in the initial years of its introduction\textsuperscript{49}. Furthermore, the new system increases welfare losses in the economy. If tax revenue does not increase substantially to offset the welfare loss, the system could be nonviable.

I. METHODOLOGY OF ANALYSIS

We determined the impact of the conversion into the Value-Added Tax in terms of tax revenue generation, by applying the present tax rates and the new rates structures on the figure of the impact of a 1\% increase in the tax rate. For comparison, we also constructed a similar set of figures under the General Sales tax system. Comparison was made as for the earlier efficiency analysis.

\textsuperscript{48} i.e. worth approximately M$ 1,321.6 millions all in all, or M$ 219 millions higher than that under the present tax rates structure.

\textsuperscript{49} As described earlier by Sandford (1986).
Several measures were been introduced to gauge tax revenue productivity. First, total tax revenue collected by each instrument is shown individually. The total would account for the productivity of the whole system, which will be used as our second measure. Third, we used the tax productivity ratio as the basis of comparison. A ratio for each of the tax systems is also presented.

II. FINDINGS FROM THE ANALYSIS

Table 6.12 and 6.13 shows the impact on tax revenue generation under the present as well as the new rate structure.
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>VAT FOOD</td>
<td>-0.2426</td>
<td>0.2426</td>
<td>-232.294</td>
<td>1,374.305</td>
<td>-232.294</td>
<td>2,236.978</td>
<td>61.4</td>
<td></td>
</tr>
<tr>
<td>VAT FOOD</td>
<td>0.2426</td>
<td>1.4355</td>
<td>1,374.305</td>
<td>2,236.978</td>
<td>61.4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VAT B&amp;T</td>
<td>0.9266</td>
<td>0.6680</td>
<td>639.523</td>
<td>1,188.829</td>
<td>53.8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VAT C&amp;FW</td>
<td>0.0082</td>
<td>0.0360</td>
<td>34.465</td>
<td>68.832</td>
<td>50.1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VAT M.DUR.</td>
<td>0.1651</td>
<td>0.7845</td>
<td>751.057</td>
<td>1,244.935</td>
<td>55.6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VAT HS.SV.</td>
<td>0.0149</td>
<td>0.2190</td>
<td>209.664</td>
<td>360.915</td>
<td>58.1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VAT INV.GDS</td>
<td>0.0000</td>
<td>1.1400</td>
<td>1,091.402</td>
<td>1,916.339</td>
<td>56.9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VAT OTH.GDS</td>
<td>0.3374</td>
<td>0.6315</td>
<td>604.579</td>
<td>1,036.727</td>
<td>58.3</td>
<td></td>
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<tr>
<td>VAT OTH.SV.</td>
<td>0.0000</td>
<td>1.3035</td>
<td>1,247.932</td>
<td>2,077.017</td>
<td>60.1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T.INC.TYPES VAT</td>
<td>1.4522</td>
<td>4.7825</td>
<td>4,578.622</td>
<td>7,893.594</td>
<td>58.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T.CONS.VAT</td>
<td>1.4522</td>
<td>3.6425</td>
<td>3,487.220</td>
<td>5,977.255</td>
<td>58.3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T.COVAT&amp; FD.</td>
<td>1.6948</td>
<td>5.0780</td>
<td>4,861.525</td>
<td>8,214.233</td>
<td>59.2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Compiled from the results of G.E. analysis.

Let us first observe the tax productivity of the Value-Added Tax system. The Value-Added Tax system introduced to replace the present Sales tax system, without changing the tax rates, would generate tax revenue of about M$ 1,390 millions. This is much lower
than the revenue generated under the present tax system\textsuperscript{50}. When we adjusted the tax rates, tax revenue increased by M$ 3,188.62 millions\textsuperscript{51}. Food, investment goods and other services are among the biggest sources of tax revenue under the Value Added tax system. This is because of the relatively high consumption of these goods by the final consumers. In terms of tax productivity, the tax on food and other services are regarded as among the best\textsuperscript{52}.

When we compare between the feasible three types of Value Added Tax systems, we find that the Consumption type, which includes foods item as its tax base is the most productive with collection averaging 59.18% of its potential. This can be explained by the bigger tax base it covers and the inelastic nature of food items\textsuperscript{53}. The system also generates the largest comparable tax revenue\textsuperscript{54}. The consumption type that excludes two of the most productive instruments, namely foods and investment goods was found to be the least productive.

To make the analysis more meaningful we will attempt to compare productivity between the two systems of Value Added Tax and the Manufacturers Sales tax. The total tax revenue collected under the Manufacturers Sales tax system was M$ 2,646 million, which is approximately

\begin{itemize}
  \item \textsuperscript{50} Which is about M$ 2,646 millions based on the calculation 2.7642 X 95,737. Based on the 1988 actual tax collection, the figure was M$ 5,107.457. The difference could be due to the extremely high tax elasticity of other goods sector.
  \item \textsuperscript{51} 230% more compared to the original tax revenue.
  \item \textsuperscript{52} Each producing more than 60% of the expected tax revenue.
  \item \textsuperscript{53} Which resulted in higher tax productivity.
  \item \textsuperscript{54} At least 39.4 % more than the Consumption tax system (M$ 4,861.5 - M$ 3,487.2 = M$ 1,374.3).
\end{itemize}
90% more than under the Value-Added Tax system, assuming that the present rates structure is retained. This could be explained by the shrinkage in the tax base under the Value-Added Tax system as input of the industries excluded from the tax base. Based on the new tax rates structure, the General Sales tax system was shown to be superior. It generated tax revenue of approximately M$6,005 million or 31% more than the revenue expected under the General Manufacturing Sales tax system. Notice that the difference had become smaller in percentage rates compared to the original position. This could be explained by the productivity rates of each of the instruments under the Value-Added Tax system.

When we compare the productivity of each of the tax instruments under the two systems, we noticed that in all the cases tax productivity is higher under the Value-Added tax system compared to the Sales tax system. The investment goods and other goods taxes introduced under the Value-Added Tax system are quite productive. The high productivity on most of these instruments, especially those which faced a larger tax base, promises a big potential for future performances. In terms of overall tax productivity, we note that the Value-Added Tax system is about 10% more productive compared to the General Sales tax system.

55 This proves the theory that Value-Added taxes is not an appropriate system under a relatively low tax rate structure.
56 In the case of other goods and manufacturing durables, the productivity rate was more than 10% higher each.
57 Especially on Manufacturing durables, other services, investment goods and food items, which are substantially consumed by final consumers.
### Table 6.13.

<table>
<thead>
<tr>
<th>Description</th>
<th>T. Tax Rev. IN %</th>
<th>T. Tax Rev. IN %</th>
<th>Tax Rev. At NEW RATES IN M$ MILL</th>
<th>Ratio of Prod IN %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sale Tax Food</td>
<td>0.0980</td>
<td>1.9155</td>
<td>1,833.842</td>
<td>63.7</td>
</tr>
<tr>
<td>S.T.B&amp;T</td>
<td>1.0210</td>
<td>0.7360</td>
<td>704.624</td>
<td>86.5</td>
</tr>
<tr>
<td>S.T.C&amp;FW</td>
<td>0.0976</td>
<td>0.4305</td>
<td>412.148</td>
<td>58.4</td>
</tr>
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<td>S.T.M.DUR.</td>
<td>0.4508</td>
<td>2.1420</td>
<td>2,050.687</td>
<td>46.3</td>
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<td>S.T.HS.SV.</td>
<td>0.0569</td>
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<td>S.T.OTH.GDS</td>
<td>1.1379</td>
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<td>6,005.104</td>
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<td>Tot.Consp.&amp; F.</td>
<td>2.8622</td>
<td>8.1880</td>
<td>7,838.946</td>
<td>51.26</td>
</tr>
</tbody>
</table>

Source: Compiled from the result of G.E. analysis.

### 6.9. Conclusion

A Value-Added Tax system could be considered as a serious contender to the present Manufacturers Sales tax system existing in Malaysia. The tax shows potential in terms of its tax burden distribution, economic efficiency and tax revenue generation capacity. It has also proven to have a tame effect on prices, wages rates and capital service rate.
The introduction of a Value-Added Tax could cause prices to rise slightly\textsuperscript{58}, but it has been proven not to generate inflationary effects in the medium or long term\textsuperscript{59}. Effects of VAT on the wage rates were quite positive. Most wage rates rose substantially, except informal labour which experienced a relatively milder wage decline.

Value-Added Tax caused demand for investment goods to fall, even though output had increased. The manufacturing durables sector experienced increased demand. But most importantly, the petroleum and primary commodities export sectors had experienced a substantial increase in their supply.

VAT caused foreign exchange rates to fall which was followed by a drop in the import of goods. Value-Added Tax had also caused firms' profitability ratio to drop marginally.

In terms of the tax burden distribution or equity objective, a Value-Added Tax system was superior in that it generated an overall progressive impact on the households tax burden distribution.

\textsuperscript{58} Especially when rates were adjusted upward to make them uniform.

\textsuperscript{59} The concern that prices will immediately increased by the rates of VAT could easily be refuted based on the observation of the present Sales tax impact. Currently, almost all taxes on the manufacturers have been shifted forward into the market, so it is expected that producers will reduce prices as a result of the switch from taxation on the manufacturers to the consumers. The tax to top the producers prices would therefore be practically unchanged.
In terms of efficiency, the Value-Added Tax system was clearly more superior, compared to the Manufacturers Sales tax system, as it generated substantial welfare gains to the economy.

In terms of tax revenue generation, the Value-Added Tax system has great potential, judging from the tax productivity measures, though immediate tax collection was lower.

Overall, the consumption type of VAT which zero-rates food items was found to be the best VAT model for the Malaysian economy. However this system is inferior in terms of tax revenue productivity.
CHAPTER 7

EVALUATION OF THE REFORM IN THE CORPORATE TAXATION

7.1. INTRODUCTION

This chapter attempts to evaluate the proposed 10% reduction in the Corporate Tax rate as outlined in the 1988 Malaysian tax reform proposal. The study employs a static General Equilibrium approach to analyse the impact of Corporate tax change on efficiency, equity distribution and tax revenue generation. It then narrows to focus on the potential impact of tax changes under different forms of Corporate taxation in an attempt to compare the sensitivity of the forms of Corporate taxation on the above three criteria. It attempts to justify the existence of Corporate Taxation in Malaysia and at the same time proposes the best form of its existence.

There is an extensive body of literature on the incidence and efficiency of Corporate Income Taxation. Corporate taxation has attracted many scholars because of its role as the single most significant contributor of tax revenue in most countries in the globe (World Bank Report 1988). In the past, most discussion focused on the method and forms of integration between Corporate Taxation and the Personal Income taxes. Goode (1951), Carter Report (1966), McLure (1973), Surrey (1975), Bird (1975) and Ault (1978) had each rationalised the existence of a classical or integration system in the corporate taxation in a particular economy.
Harberger (1962) introduced a slightly different approach of Corporate taxation. He introduced a general equilibrium model with two industries to study the distributional effects of discriminatory taxes levied on the corporate sector. This shifted the attention on the whole corporate tax issue from merely the form of corporate taxation to overall corporate tax existence justification. This analysis had been extended by McLure (1975), Shoven (1976) and Ballentine (1978). The issues were broadened to include all form of taxes on capital, rather than just corporate income. Mussa (1974), Neary (1978), Summers (1981), Brock and Turnovsky (1981), Hayashi (1982), Auerbach, Kotlikoff and Skinner (1983), Fullerton et al. (1983), Bovenberg (1988) each attempted an analysis of capital taxation either in a static model, dynamic intertemporal, perfect or imperfect capital mobility, single or intersectoral sector.

Stiglitz (1976), in his analysis of Corporate tax attempted to prove the non-distortionary effect of the tax, had disintegrated corporate taxes into four different functional taxes and concluded that as a tax on pure profits, on capital and on risk taking, it was non-distortionary. It is like a tax on entrepreneurship that causes distortion in the Corporate tax. This is because entrepreneurs do not normally withdraw their full imputed salaries from their company. Corporate tax is, in effect, a tax on imputed income of entrepreneurs. It determines the level of imputed wages (reinvestment) of the entrepreneurs and therefore distorts the investment decisions of the corporation.

Harberger (1962) contended that Corporation tax was very distorting, with effects amounting to more than 20% of corporate tax revenue collected in the USA. He therefore advocated the abolishment of the tax by fully
integrating the tax with personal income tax, especially in the long run. His views were based on the classical corporate tax situation. The corporation tax here was considered to be a separate tax from income tax on individual. It therefore discriminates dividend income against interest and other form of capital income. This created a major distortion in the tax. The discussion was also based on the premise that Corporate taxes are borne mostly by capital owners. Harberger infact concludes that capital bears 100% of the burden of corporation tax in the USA. This could be true in the short term as had been conceded by Lent (1974), who also argued that the opportunities for short run shifting were somewhat circumscribed by a limited market, government price controls and extremely competitive conditions in the market.

Fleming (1976), also contended that assuming that there is no other distorting tax in the system, Corporate tax that only includes profits and return on capital which does not discriminate between interest and dividends is non-distortionary.

Harberger's analysis and findings were actually consistent with others like Stiglit and Fleming, except the latter identified the specific source of distortion, i.e., discrimination in the treatment between taxes on Corporation and taxes on entreprenuers. It finally boiled down to the "integration aspect" of income and Corporation Tax. If they were fully integrated, the distortion element would disappear. In the case of apartial integration system, distortion still exists, at least as a result of a timing advantage enjoyed by some group of taxpayer.
What role does Corporation tax play in an economy? A few assertions can be made. First, the tax could be argued based on the benefits-received justification as corporation as an entity in business enjoys governmental benefits of one kind or another. Corporations also enjoy special privileges of incorporation conferred by the governments. The connection of benefits and taxation in these cases is either very loose or completely nonexistent. Based on this justification, Break (1969) argued that if any profit tax is to be justified, it would have to be measured by incremental earnings.

The second most popular argument was the ability to pay justification. Here, the uncertainty regarding the corporate tax incidence must be resolved. If the main burden falls on corporate stockholders, the tax could be regarded as inequitable and distorts the allocation of resources away from their most efficient uses. If the tax is significantly shifted forward to consumers or backward to workers and factor owners, it also generates a different set of inequities and inefficiencies.

An equally important argument involves the role of corporation tax as the main source of tax revenue generation. This is the most valid argument as far as the Treasury is concerned. In the case of the United States for example, Musgrave (1987) estimated that an 8% reduction in the Corporate tax rate would cost the US Treasury about US$ 20 billion. The same argument applies for Malaysia.

Fleming (1976) concluded that, at the very least, corporation tax could play two possible roles in an economy. First, it is a method of taxing pure profits, which optimal tax theory indicates should be heavily taxed. Secondly, Corporation tax could be used as a
method of eliminating the distortion of intertemporal choice introduced by the personal income tax where free depreciation is allowed. This is because corporation tax which exempts interest would treat pure profits equally as the straight income tax and does not distort intertemporal choice. Therefore, by allowing free depreciation, corporation tax will offset the intertemporal distortion effect of income tax.

7.2. THE MALAYSIAN CORPORATE TAX REFORM

The basic objectives of the reform in Corporate taxes was to achieve greater efficiency in the Corporate sector, to at least maintain the revenue potential of the tax instrument and at the same time improve administrative efficiency in collecting the tax. The strategies put forward were as follows:

* Broaden the tax base by limiting or abolishing exemption in income taxable.
* Integrate Corporate tax with that of Development tax, and,
* Simplify administrative procedures in assessment and tax collection.

The few major reform proposals put forward were:

* Reduce the Corporate tax rate by 5%
* Abolish the 5% Development tax on corporation
* Withdraw benefits in kind deduction in the companies accounts which would indirectly broaden the corporate tax base.
* Abolish the unproductive Share Transfer tax.
* Introduce group relief provision which allows companies in a group to consolidate accounts for purposes of filing
* Change the corporate integration method from the present imputation system to the tax deduction system.

For purposes of our evaluation, we will limit the analysis on the 10% effective reduction in the tax rates on corporate income\(^1\) and evaluation of the tax deduction system. The increase in the tax base could be treated as a bonus even though some, such as the abolishment of exemptions, could be expected to materialise immediately. The reduction in corporate tax rates by 5% was expected to reduce tax revenue by about M$ 550 million, while abolishing of the Development tax would cost the Treasury M$ 450 millions.

7.3. METHODOLOGY OF DATA ANALYSIS

The analysis utilise the General Equilibrium model results presented earlier in Chapter five as a basis. The model integrates both Corporate tax and development tax as a single tax on corporation. The impact and effect of the 1% increase in the Corporate tax (in absolute terms) will be extrapolated to gauge the impact and effect of the reduction in the Corporate tax rates by 10%. Analysis will focus on the impact in terms of efficiency, revenue productivity and tax burden distribution.

Three different results will be presented in the analysis. The base case will show a result, assuming income elasticity of public households for capital services as unitary (1), leaving the other classes of households having a zero income elasticity on capital

\(^1\) i.e., 5% Corporate tax plus 5% Development tax on corporate income.
services each. The second case showed a result of changing the foreign income elasticities from zero to -0.0114 beside the unitary elasticity of capital services for the public sector. The third case showed the result of assuming zero-income elasticity for capital services of all households.

The three cases were selected to show the three extreme situation and their effect on the changes in Corporate tax. The first case exhibits an extreme situations where public as well as foreign households were expected to respond to changes in their income in terms of their supply of capital services. Under this situation, the effect on the corporate tax rate reduction was expected to be mild as the effect would be superimposed by the income effect. The second case (which is the base case) attempts to show the moderate effect by only allowing the public household to show some reaction to the tax change. This is thought to be the most realistic case as foreigners, which in our case were assumed to be 'the rest of the world', were not expected to respond to the change in their income. The third case showed the other extreme situation where all households

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2 In this case, price elasticities of capital services for public and foreign sector were -0.2378 and 0 respectively.
3 This caused a price elasticity of capital services to change to -3.05 in the case of foreign households.
4 Reflecting the perfectly inelastic nature of capital services to the household group. This assumption also makes the price elasticities of capital services for public and foreign household equal zero.
5 In all the cases described, the private household income elasticity, with respect to the supply of capital services, was assumed to be zero as investment behaviour was assumed to be fixed.
were assumed to have zero income elasticity for capital services. This means that there is no income reaction on the supply of capital services expected from the households sector as the supplier of capital services. Corporate tax changes were expected to show more severe effects in this case as no other effect would be expected to show in the result.

A separate analysis was also conducted on the different levels and target taxpayers groups by imposing Corporate taxes alternately on different target groups and running the model alternately. This is actually an evaluation of the alternative type of corporate tax system, namely the present imputation system (a tax on the households sector), the pure corporate tax (a tax on the firms sectors) and the classical corporate tax system (a tax on both the firms and households sectors). Results were then presented in the form of comparisons between the level and form of corporate taxes.

It must be stressed that all the analyses are made on the basis of marginal effect of tax changes. Data used in the analysis is based on the result of the 1% increased in the corporate tax rate. The data were then extrapolated to take into account the effect of the 10% reduction in the corporate tax rate. For the analysis of methods of corporate taxation, the normalised figure was used. This figure shows the effect of corporate tax change that generates equal tax revenue.
7.4. RESULT OF THE ANALYSIS

A. ANALYSIS OF THE IMPACT OF TAX RATES REDUCTION ON THE MARKET PRICES

Observations were based on the effect of the 1% increase in the Corporate tax rate on the market prices. Figures were inflated by 10 and sign switched\(^6\) to reflect the 10% decline in the rates.

* BASE CASE RESULT

First, we look at the price of capital services itself or firms profitability ratio\(^7\). In making the observation, we must bear in mind that Corporate tax is being imposed on the household sector\(^8\), as the owner of capital. As a direct tax on the household group, Corporate tax is expected to be absorbed\(^9\). Households are normally not able to shift tax backward to the firms sector, except where capital services form an integral part of their input. In our model, it was observed that price elasticities for capital services of the firms were

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\(^6\) Negative figures will be converted into positive and vice versa.

\(^7\) As we interpret it.

\(^8\) Particularly the private households and the foreign households.

\(^9\) At least a large proportion of them.
very elastic, except for other services; primary commodities and beverage and tobacco. Thus, there is a possibility of shifting some part of capital tax backward to the firms. Income elasticities are also significant in determining the rate of capital services, especially for foreign and public households.

An initial observation on the capital services prices change showed that capital services rates had actually dropped by 0.239% as a result of the 10% reduction in the corporate tax rate. There could be several reasons for this drop. First, households, as the owner of capital actually pass on some of the tax reduction benefit backward to the firms sector as the user of capital services. This is coupled by increased wage rates which form part of input costs. The decline in some goods prices also caused the profitability ratio to drop.

For other prices, most goods and services had experienced price increases, except beverages and

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10 The aggregated firms price elasticities for capital services calculated in the model based on the formula described earlier were as follows:

<table>
<thead>
<tr>
<th>Category</th>
<th>Elasticity</th>
</tr>
</thead>
<tbody>
<tr>
<td>FOOD</td>
<td>4.3165</td>
</tr>
<tr>
<td>BEVERAGE AND TOBACCO</td>
<td>1.5006</td>
</tr>
<tr>
<td>CLOTHING AND FOOTWEAR</td>
<td>9.3734</td>
</tr>
<tr>
<td>MANUFACTURING DURABLES</td>
<td>24.1219</td>
</tr>
<tr>
<td>HOUSEHOLD SERVICES</td>
<td>124.2733</td>
</tr>
<tr>
<td>INVESTMENT GOODS</td>
<td>15.9744</td>
</tr>
<tr>
<td>OTHER GOODS</td>
<td>16.1688</td>
</tr>
<tr>
<td>PETROLEUM</td>
<td>18.5402</td>
</tr>
<tr>
<td>OTHER SERVICES</td>
<td>-358.9338</td>
</tr>
<tr>
<td>PRIMARY COMMODITIES</td>
<td>0.3901</td>
</tr>
</tbody>
</table>

11 Prices fell for beverage and tobacco, household services, investment goods and other services. These goods are mostly consumed by the households sector, which generates minimum impact on manufacturing costs.
tobacco, households services, investment goods and other services. Relating this price decline with the factor intensities of the firms sectors, we can say that the relevant sectors which produce these particular goods, utilise capital services in substantial proportion of input. Plausibly, households sector, as the owners of capital passed the tax reduction benefit backward to the firms sectors. The reduction in the market prices of these four products is therefore reflective of this reduction in the costs of production. The benefit shifting that occurred here is quite significant, especially for beverage and tobacco, households services and other services.

In other cases, the decline in the capital services rate caused market prices to rise quite substantially. This is especially true in the case of primary commodities and manufacturing durables. The manufacturing durables price increase was not surprising as capital services form a very small proportion of firms value added. Prices of other goods which form part of the input costs, on the other hand, had increased. This is coupled with the wage rates increase which altogether caused production cost to escalate. In the case of primary commodities, the price increase was due to the relatively inelastic nature of the sector in relation to the price of capital services. In this case, presumably households did not pass the tax reduction benefit to them. In the meanwhile, wage rates especially on informal labours and entrepreneurs, which form part of their production costs, had increased. The increased demand for these goods, particularly by the foreign sector, enabled them to further shift the cost increase forward into the market.
* COMPARISON BETWEEN THE BASE CASE AND THE OTHER TWO CASES

The capital services price or profitability ratio of the firms sectors declined by 2.965% under the first case where foreign households income elasticity was altered from zero to $-0.0114^{12}$. This is the biggest reaction compared to the other cases examined. This is explained by the reaction shown by the foreign households as the major supplier of capital services.

\[^{12}\text{This resulted in a change in the price elasticity of the foreign sector in relation to capital services.}\]
### TABLE 7.1.

**CORPORATE TAX RATE REDUCTION EFFECT ON MARKET PRICES**

<table>
<thead>
<tr>
<th>in % as a result of the 10% reduction in the tax rate</th>
<th>Pb.inc.€.of 1 Frg.in.€.-0.01</th>
<th>Base case-Hsl inc.elas.of 1</th>
<th>0 inc.elas.on all hslds.</th>
</tr>
</thead>
<tbody>
<tr>
<td>FOOD</td>
<td>-0.0130</td>
<td>0.0030</td>
<td>0.0160</td>
</tr>
<tr>
<td>BEV. &amp; TOBB.</td>
<td>-0.6720</td>
<td>-0.1490</td>
<td>0.1000</td>
</tr>
<tr>
<td>CLOTH. &amp; FWEAR.</td>
<td>0.3310</td>
<td>0.1000</td>
<td>0.0360</td>
</tr>
<tr>
<td>MFG.DURBLES.</td>
<td>0.4360</td>
<td>0.1690</td>
<td>0.1670</td>
</tr>
<tr>
<td>HSLD.SERV.</td>
<td>-1.0890</td>
<td>-0.2090</td>
<td>0.2670</td>
</tr>
<tr>
<td>INVST.GOODS.</td>
<td>0.0360</td>
<td>-0.0410</td>
<td>-0.1630</td>
</tr>
<tr>
<td>OTHER GOODS</td>
<td>0.1840</td>
<td>0.0080</td>
<td>-0.1330</td>
</tr>
<tr>
<td>PETROLEUM</td>
<td>-0.8310</td>
<td>0.0000</td>
<td>0.7090</td>
</tr>
<tr>
<td>OTHER SERVICES</td>
<td>-1.1240</td>
<td>-0.2070</td>
<td>0.3030</td>
</tr>
<tr>
<td>PRIM.COMMODITIES</td>
<td>0.5720</td>
<td>0.3940</td>
<td>0.7370</td>
</tr>
<tr>
<td>CAPITAL SERVICES</td>
<td>-2.9650</td>
<td>-0.2390</td>
<td>1.7780</td>
</tr>
</tbody>
</table>

Source: Compiled from the results of three separate runs on the General Equilibrium model program.

The negative price elasticity means foreign households will actually decrease their supply of capital as a result of the decline in the corporate tax rate. Overall capital services declined in supply. On the other hand, prices of goods and services declined sharply, especially for other services, household services, beverage and tobacco and petroleum. This is followed by increased wage rates, except for unskilled and skilled
labours rates. This caused a profitability ratio of the firms sector to drop drastically.

Comparing the effect on prices of other goods and services in the economy between the base case and the first case, revealed the marked similarity in effects between them except that the effect was more severe where the foreign household were allowed to have some income effect\(^{13}\). The other marked difference was that in this first case\(^{14}\), the corporate tax rate reduction caused petroleum product prices to decline quite drastically. Bear in mind that petroleum is heavily consumed by the foreign sector\(^ {15}\).

Comparing the two cases above with the third case where public sectors and foreign households income elasticities on capital services were fixed at zero, the effect of corporate tax rate reduction on prices had been in the opposite direction in the case of food, beverage and tobacco, household services, petroleum and other services. In this third case, price changes on clothing and footwear, manufacturing durables and primary commodities, were more substantial. This could be traced to the constraint income effect assumption of the public and foreign households on these goods. The price effect was caused primarily by reducing public expenditure due to the decline in the corporate tax revenue.

\(^{13}\) This could be traced to the larger increase in the supply of these goods as a result of the capital services rates reduction.

\(^{14}\) Where foreign sector is allowed to show their income response.

\(^{15}\) Demand for petroleum products dropped by nearly 5%.
B. ANALYSIS OF PROJECTED IMPACT ON TAX REVENUE REDUCTION

The tax revenue impact analysis is again based on the figure of 1% change in the Corporate tax rate. It was inflated to reflect the impact of the 10% tax rate reduction.

BASE CASE RESULT

The 10% reduction in the corporate tax rates caused tax revenue to drop by 3.178% of the national income which amounted to about M$ 3.048 billion. This was much higher than the rough estimates made earlier. This amounted to about 54% of the Corporate tax revenue in 1988 or 13% of the total tax revenue in the same year.

The tax revenue loss estimates here are conservative considering that the present effective tax rate on corporate tax is only 12.2%, even though the statutory rate is at 45%. In our benchmark data, we used the actual corporate tax for 1988, or the 12.2% effective tax rate rather than the 45% statutory rate. Logically, the 10% drop in the statutory rate will only reduce the effective tax rate by 2.7111%. The more optimistic figure of tax revenue loss would therefore amounted to M$ 861.588 million. This is 15.337% of the

\[45\alpha = 12.2\]
\[\alpha = 0.2711\]

A 10% reduction would amount to 2.711%.

\[\text{This is closer to the estimate made by the Tax Reform group i.e. M$ 1 billion.}\]
corporate tax revenue in 1988\textsuperscript{19}, assuming the effective tax rate would drop to 9.489%. With the new rate and a tighter administration, the effective rate would be expected to improve. However, the amount is still quite staggering.

The question then is, can the Treasury afford to lose so much tax revenue? The Treasury must find a new source of tax revenue in order to compensate the lost revenue from corporate tax reduction. Considering that Corporate Tax is one of the most productive tax instruments in the economy, the loss in the tax revenue is expected to be great. It would be difficult to replace the tax revenue loss from the other tax instruments which are as productive as this tax\textsuperscript{20}. The other productive taxes i.e. on beverage and tobacco and primary commodities could not be relied upon as they are inefficient. See discussion in chapter five on this.

COMPARISON WITH THE OTHER TWO CASES

The impact of corporate tax rate reduction on the tax revenue was most severe in the third case where revenue dropped by 3.352% of national income compared to 1.99% in the first case (and 3.178% in the base case). We observed that when we allow the public and foreign households to respond to the tax rate change, the effect was milder. This could be explained by the larger

\textsuperscript{19} Or about 3.45% of the total tax revenue in 1988.

\textsuperscript{20} Corporate tax is capable of collecting 66.14\% of the expected tax revenue and ranked third next to the tax on beverage and tobacco and producers tax on primary commodities.
transactions involved in this first case compared to the third which could have compensated the direct tax revenue loss.

C. ANALYSIS OF THE PROJECTED IMPACT ON ECONOMIC EFFICIENCY

To project the impact of the 10% reduction in the tax rates on efficiency, we used the figures on the basic result\textsuperscript{21}, and extrapolated to reflect the total impact above.

BASE CASE RESULT

Corporate tax is quite an efficient tax instrument even though it could not be as efficient as the Lump sum tax\textsuperscript{22}. It only contributes to an overall welfare loss of about 0.0047% of national income for every 1% tax imposed. The 10% tax rate reduction would therefore be expected to increase the overall welfare gains in the economy\textsuperscript{23} by about 0.98% of the total corporate tax revenue. Based on the estimate of the tax revenue loss, this welfare gain is only 5.2%\textsuperscript{24}. This reflects the relatively small potential improvement in the efficiency compared to the tax revenue that had to be sacrificed, which made the reform less optimal. Ideally, we should reduce tax rates for instruments which are most inefficient in the economy to expect some improvement in

\textsuperscript{21} i.e. effect of a 1% tax rate increase in the corporate tax rate.
\textsuperscript{22} Under the first best or ideal situation.
\textsuperscript{23} Of about 0.047% or worth of about M$ 45 million.
\textsuperscript{24} Which infer that for every M$ 1 loss in the tax revenue, we only gains M$ 0.052 in terms of efficiency.
the efficiency so as to make the reform worthwhile. The fact that Corporate tax is the forth most efficient tax instrument in the economy made us question the rationality of this reform proposal.

Observing the impact on private household welfare, however, we can justify the reform proposal. Total welfare gains experienced by the households (excluding public and foreign sectors) is M$ 3,694 million\(^{25}\). If we compare the private welfare gains expected to be experienced by the private households in the economy with the expected tax revenue loss, we have a ratio of 1.212 to 1. This means that for every M$ 1.212 worth of utility gains, it only costs M$ 1.00 of tax revenue. Bear in mind, that this ratio only takes into account the welfare improvement of the private households, while the tax revenue loss used in the comparison affects the whole economy.

A more appropriate measure of efficiency\(^{26}\) is to compare between the expected private welfare gains with the estimated public sectors utility loss. The expected utility loss of the public sector as a result of the 10% corporate tax rate reduction is 16.294% of the public sectors net income or M$ 4,327 billions. The private welfare gains described above therefore were only 85.37% \(^{25}\) The difference in the welfare effect on the economy could be accounted by the large welfare loss experienced by the public sector i.e. M$ 4,327.03 millions. This had resulted in a net welfare loss of about M$ 633.03 millions. \(^{26}\) which will compare utility with utility and therefore could be regarded as more accurate as the value of tax revenue will be converted into utility, which is not the same. For example the M$ 3,048 millions tax revenue loss became M$ 4,327 million when converted into utility (M$ 1.4196 worth of utility for every M$ 1 of tax revenue).
of the utility loss of the public sector. We could conclude that, overall, the tax rate reduction would resulted in a net loss in the economy from the net loss of public utility of M$ 633 million, or M$ 374 million in terms of tax revenue loss to the economy.\textsuperscript{27}

D. ANALYSIS OF THE PROJECTED IMPACT ON TAX BURDEN DISTRIBUTION

I. METHODOLOGY OF ANALYSIS

In terms of equity or tax burden distribution, the impact of Corporate tax reduction can be gauged by observing the change in the real income of each individual private household. We took the result presented earlier, showing the change in real income as a result of a 1% increase in the corporate tax rate. We then extrapolated the figures to reflect the impact of the 10% reduction in the tax rate. We have taken figures from all the three cases and converted them into M$ to make them more comparable. We had then extended the analysis by applying the Atkinson’s inequality index on the figures of real income change. Here, we confined the analysis on the impact in the base case only.\textsuperscript{28}

II. FINDINGS FROM THE ANALYSIS

BASE CASE RESULT

Table 7.2 shows that as a result of the 10% reduction in the Corporate tax rate, the unskilled

\textsuperscript{27} assuming that a M$ 1 tax revenue loss is worth M$ 1.4196 of public utility loss as determined above.

\textsuperscript{28} where we assumed that private and public household income elasticities are at unity (1).
labours actually experienced some welfare loss. This can be traced to the substantial drop in wage rates and the supply of labour services by this group. The other groups of households experienced welfare gains with the informal labours group, skilled labour and entrepreneurs experiencing an appreciable welfare increased.

<table>
<thead>
<tr>
<th>TABLE 7.2.</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAX BURDEN DISTRIBUTION IMPACT OF THE CORPORATE TAX REDUCTION after the 10% reduction in the tax rate (in M$ MILLION)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Pb inc. ε of 1</th>
<th>Frg. inc. ε = 0.01</th>
<th>Base case-Hsi inc. elas. on 1</th>
<th>0 inc. elas. on all hshlds.</th>
</tr>
</thead>
<tbody>
<tr>
<td>INFORMAL LABORS</td>
<td>1,862.40</td>
<td>1,062.91</td>
<td>1,119.59</td>
<td></td>
</tr>
<tr>
<td>UNSKILLED LABORS</td>
<td>-199.85</td>
<td>-562.96</td>
<td>-1,429.93</td>
<td></td>
</tr>
<tr>
<td>SEMISKILLED LABS.</td>
<td>40.91</td>
<td>50.92</td>
<td>36.04</td>
<td></td>
</tr>
<tr>
<td>SKILLED LABORS</td>
<td>895.75</td>
<td>1,353.37</td>
<td>1,659.82</td>
<td></td>
</tr>
<tr>
<td>TOP MANAGEMENT</td>
<td>459.55</td>
<td>653.70</td>
<td>840.03</td>
<td></td>
</tr>
<tr>
<td>ENTREPRENEURS</td>
<td>871.32</td>
<td>1,136.15</td>
<td>1,454.73</td>
<td></td>
</tr>
<tr>
<td>Weighted average real inc. changes</td>
<td>655.01</td>
<td>616.68</td>
<td>613.38</td>
<td></td>
</tr>
<tr>
<td>TOTAL WELFARE GAINS</td>
<td>3,930.08</td>
<td>3,694.09</td>
<td>3,680.28</td>
<td></td>
</tr>
</tbody>
</table>

Source: Compiled from the results of the G.E. model.

BASE CASE RESULT

The base case showed that the higher income groups experienced a relatively higher real income increase. Coupled with the welfare decline experienced by the low income group, the impact does look regressive. This
impact largely reflects the effect of a reduced supply of labour services by each of the labour groups.

COMPARISON BETWEEN THE BASE CASE AND THE OTHER TWO CASES

The first case looked much positive compared to the base case. Informal labour experienced the largest welfare gains, primarily because of the large increase in their wage rates. The welfare gains experienced by the higher income groups were smaller, again reflecting the impact of wage rates and labour supply increase on them. The impact on unskilled and semi-skilled labours groups was still similar\(^{29}\). The third case could be considered to be the most sensitive to income distribution. The large welfare loss experienced by the unskilled labour group was mainly due to a large wage rate decline. The welfare gains experienced by the higher income groups were also the largest here. Tax burden distribution is expected to be most regressive here. The reason for this is the smaller transaction base allowed which exaggerated the impact of wage rates and labour services on the overall welfare of the private households. In the first case, effects were found to be most progressive, mainly because of the larger transaction base which allows private households to readjust their position to improve their welfare position. Comparison between the total as well as weighted average real income had lead to the same conclusion.

To see a clearer effect on tax burden distribution, we applied four indexes of inequality aversion on the figures of real income change to measure the weighted

\(^{29}\) relatively too small compared to those experienced by other groups.
average welfare gains/losses of the private households. The result is shown in Table 7.3.

At unitary inequality aversion, where we begin to show some concern for income distribution, the weighted average welfare gain is M$ 616 million. When we increase our concern for the poorest group in the economy and apply the inequality aversion index of two, we noticed that the weighted average welfare gains had increased, indicating the progressive nature of the distributional impact compared to the previous one. As the inequality aversion index grew, the weighted average welfare gains improved, reflecting the relatively progressive nature of the impact on the tax burden distribution. The distributional impact is progressive.
TABLE 7.3.
REAL INCOME CHANGE BASED ON INEQUALITY AVERS. INDEX ANALYSIS
( IN M$ MILLION )

<table>
<thead>
<tr>
<th>Act.W. gains/loss</th>
<th>Inequality Aversion factors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>INFORMAL WORKERS</td>
<td>1,063</td>
</tr>
<tr>
<td>UNSKILLED LABORS</td>
<td>-563.0</td>
</tr>
<tr>
<td>SEMISKILLED LABORS</td>
<td>50.92</td>
</tr>
<tr>
<td>SKILLED LABORS</td>
<td>1,353</td>
</tr>
<tr>
<td>TOP MANAGEMENT</td>
<td>653.7</td>
</tr>
<tr>
<td>ENTREPRENEURS</td>
<td>1,136</td>
</tr>
</tbody>
</table>

Weighted average welfare gains

<table>
<thead>
<tr>
<th>Weighted average welfare gains</th>
</tr>
</thead>
<tbody>
<tr>
<td>616.7</td>
</tr>
</tbody>
</table>

TOTAL WELFARE GAINS

<table>
<thead>
<tr>
<th>TOTAL WELFARE GAINS</th>
</tr>
</thead>
<tbody>
<tr>
<td>3,694.</td>
</tr>
</tbody>
</table>

Source: Compiled from the results of the G.E.model.

7.5. EVALUATION OF THE VARIOUS FEASIBLE FORM OF CORPORATE TAXATION.

A. BACKGROUND

Discussion on the corporate taxation in the past decades focused on the method of integrating corporate tax with that of personal taxation. (see for example Goode (1951), Carter’s report (1966), McLure Jr. (1973),
Bird (1975), Cnossen (1984) and Krever (1985). On one extreme, the classical tax system on corporation was advocated whereby corporation is taxed as a separate entity without any integration attempted on the tax on dividend income of shareholders. This, in essence, means that there is double taxation of dividend income; once at corporate level in the form of corporate profit and another at shareholders level in the form of dividend tax (or as part of income taxes). Most developed countries like the U.S.A., Canada, Australia\textsuperscript{30} and some European countries practiced this system widely.

On the other extreme is the complete integration system, where the existence of a corporate entity is not recognized for tax purposes at all. Here corporate income will be treated just like then income of sole proprietors or partnership and assumed to have been immediately distributed to their shareholders after being earned for taxation. Taxes would therefore be imposed on shareholders only. This complete integration method claimed to be the most efficient method of taxing corporate profit. No one has actually practiced this complete integration system for practical reasons.

There are a few variations in between which actually form what is commonly referred to as the partial integration system. Most countries in the world practiced one form of partial corporate tax integration or the other. Some integrate taxation at the corporate level and label the system as the 'Dividend deduction system', 'Dividend credit system' or 'Split rate system'\textsuperscript{31},

\textsuperscript{30} Until recently when they decided to switch to the imputation system.

\textsuperscript{31} As being practised in the U.K.

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depending on the nature of integration. Some countries on the other hand, choose to integrate tax at the shareholders level and label it the 'Dividend exemption system' or 'imputation system'; also depending on the method of integration used.

In the 1988 Malaysian Tax reform exercise, the 'Dividend deduction system' was proposed to solve a few administrative problems. It is however not known which method of corporate taxation is most efficient for Malaysia. A study by Ballard, Fullerton, Shoven and Whalley (1985) using a dynamic General equilibrium model demonstrated that, overall, the complete tax integration is the most efficient form of corporate tax, followed by the dividend deduction system. It was also found that the imputation system is the worst method of integrating corporate taxation system.

The exercise attempted here will capture the three basic models of corporate tax system. It will show the impact of classical tax system (taxing both corporation and households), integration at corporate level (taxing the corporation only) and integration at shareholders level (taxing the households only). A separate benchmark data set was constructed simply by changing the targeted groups for corporate tax, leaving the total remaining corporate tax the same in all the three cases. In the case of classical method, a uniform tax rate was applied to all firms and households. The result was presented in the form of comparative figures.

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32 As practised in Malaysia.
33 Also known as the dividend grossed up system.
B. METHODOLOGY OF ANALYSIS

The computer program was rerun several times to perform sensitivity analysis on the few feasible system of corporate taxation. Original benchmark data was used as the base. Three variations had been taken. First is based on the 'Imputation system' of taxation\textsuperscript{34}, which is actually the base case used in our model, as the system is currently being implemented in the economy. The second case is based on the system of 'Pure corporate tax'\textsuperscript{35}. The third case is based on the 'Classical system' of corporate taxation\textsuperscript{36}.

The result obtained however still reflects the impact of marginal changes rather than total changes. It therefore showed only the effect of 1% increase in the corporate tax rate under the three systems of taxation. We attempted to use this result as a basis of comparison between the three different system of taxation. To make the comparison more meaningful, we used the figures of normalised changes, which showed the effect of tax changes that generate equal tax revenue each.

\textsuperscript{34} Where corporate tax was assessed on households sectors as the final claimant of capital income.
\textsuperscript{35} Where corporate tax was assessed solely on the firms sector itself without affecting the shareholders (households).
\textsuperscript{36} Where corporate tax has been imposed on both the firms sectors on its profits (or capital services costs) and the households (as the owner of capital) on the dividend income earned (capital income).
C. FINDINGS FROM THE RESULTS

I. PROJECTED IMPACT ON TAX PRODUCTIVITY

The corporate tax rate increase caused tax revenue to rise by 0.3178% of national income (M$ 304.3 million) under the imputation system, 0.3309% (M$ 316.8 million) under the tax deduction method and 0.5782% (M$ 553.6 million) under the classical system. The more productive nature of the classical system could be rationalised because it was targeted at a large tax base.

In terms of tax revenue productivity, after comparing the actual tax revenue increase with the expected figures, the ratio worked out to be 66.13% under the imputation system, 69.9% under the pure corporate tax system and 60.6% under the classical system. This indicates that in terms of tax productivity, the Pure Corporate tax system is the most efficient, while the imputation system is the worst. This could be explained by the inelastic nature of capital demand by the firms sector, and relatively elastic supply of capital by the households sector. Targeting the firms sector rather than the households sector is also thought to be more convenient in terms of administrative efficiency.

37 Calculated based on 1% of the tax base under each of the three cases.
38 Judging from the relatively large proportion of capital input in the production costs of most industries.
II. ANALYSIS OF THE PROJECTED IMPACT ON ECONOMIC EFFICIENCY

The net welfare loss experienced by the economy are M$ 62.94 million, under the Imputation system, M$ 37.49 million under the tax deduction method and M$ 108.4 million under the classical method. The classical method of taxation again emerged with the biggest net welfare change. The tax deduction system (or pure profit tax system), on the other hand produced the least net welfare change. The high net welfare produced by the classical system is related to the more transactions involved in the system and hence generate more distortions to the economy.

A more robust analysis was attempted by taking into account the utility gains of the public sector\textsuperscript{39} and utility loss of the private households\textsuperscript{40}. The ratio of private utility loss per unit of public utility gains was introduced. Comparison was made between the three forms of taxation system based on this criteria. The figures were M$-0.824, M$-0.663 and M$-0.745 under the imputation system, the pure corporate tax (tax deduction system) and the classical system respectively. This shows that the public sectors utility increase was larger compared to the private utility that had to be sacrificed in all three cases, which again projects the relatively efficient nature of corporate taxes. However, the Pure Corporate tax system was found to be the most efficient form of corporate tax system. It is at least 8% more efficient than the imputation tax system based on the above ratio. It is surprising to observe

\textsuperscript{39} As a result of the increased tax revenue from the increased tax rate.

\textsuperscript{40} as a result of the 1% increase in the tax they have to bear.
that the Classical system is not faring as poorly as expected.

To complete the analysis, another measure has been introduced by relating the real national income change with the marginal tax revenue result from the increased tax rates\footnote{Marginal real national income loss \over marginal tax revenue} and also private household utility loss to the marginal tax revenue\footnote{Marginal private utility loss \over marginal tax revenue}. Using the first measure, the figures under the imputation system are M$ - 0.2070 per M$ 1 of tax revenue increase. The figures under the pure corporate tax and the classical tax system are M$ - 0.1183 and M$ - 0.1958 respectively. It showed again that the Pure corporate tax system is the most efficient, while the imputation system was found to be the worst. The figures for the other ratio were M$-1.2129, -1.5096 and -1.3426 under the imputation, pure corporate tax and the classical tax system respectively. Here the imputation system is shown to be more efficient basically because of the smaller private utility loss resulted by the system.

III. ANALYSIS OF THE PROJECTED IMPACT ON EQUITY DISTRIBUTION

Based on the figures of real income changes of the private households, the imputation tax system was the most superior. It generated the minimum average real income loss on private households. The classical system, on the other hand, was the worst in terms of its distributive impact as shown in Table 7.4.
The imputation tax system is the most superior because it generated the least weighted average real income loss to the household sector. If we observe the tax burden distribution, the imputation system would be expected to generate a relatively more progressive impact.

<table>
<thead>
<tr>
<th>TABLE 7.4.</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOUSEHOLD REAL INC. IMPACT ON THE DIFFERENT FORM OF CORP. TAXES</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Base case Imputation sys</th>
<th>Tax deduction at corp. level</th>
<th>Classical tax on corporat’n</th>
</tr>
</thead>
<tbody>
<tr>
<td>INFORMAL LABORS</td>
<td>- 108.24</td>
<td>- 117.67</td>
</tr>
<tr>
<td>UNSKILLED LABORS</td>
<td>58.05</td>
<td>65.65</td>
</tr>
<tr>
<td>SEMISKILLED LABS.</td>
<td>- 4.04</td>
<td>- 52.43</td>
</tr>
<tr>
<td>SKILLED LABORS</td>
<td>- 135.18</td>
<td>- 129.40</td>
</tr>
<tr>
<td>TOP MANAGEMENT</td>
<td>- 65.50</td>
<td>- 128.64</td>
</tr>
<tr>
<td>ENTREPRENEURS</td>
<td>- 114.19</td>
<td>- 115.48</td>
</tr>
<tr>
<td>Weighted average real inc.changes</td>
<td>- 61.52</td>
<td>- 79.66</td>
</tr>
<tr>
<td>Total real income changes</td>
<td>- 369.10</td>
<td>- 477.96</td>
</tr>
</tbody>
</table>

Source: Compiled from three different runs of the G.E. model.

To satisfy our curiosity, we had to apply the Atkinson’s inequality aversion factor of one on the set of figures shown in Table 7.4. This resulted in a weighted distribution giving more weight to the poorest group in the economy. A weighted average as well as a total real income changes is presented in Table 7.5.
TABLE 7.5.

TAX BURDEN DISTRIBUTION BASED ON INEQUALITY AVERSION FACTOR ANALYSIS UNDER DIFFERENT FORM OF CORPORATE TAX SYSTEM

<table>
<thead>
<tr>
<th></th>
<th>Base case Imputation sys</th>
<th>Tax deduction at corp. level</th>
<th>Classical tax on corporat'n</th>
</tr>
</thead>
<tbody>
<tr>
<td>INFORMAL LABORS</td>
<td>- 265.75</td>
<td>- 288.90</td>
<td>-526.37</td>
</tr>
<tr>
<td>UNSKILLED LABORS</td>
<td>+ 65.20</td>
<td>+ 73.74</td>
<td>+ 121.62</td>
</tr>
<tr>
<td>SEMISKILLED LABS.</td>
<td>- 3.03</td>
<td>- 39.35</td>
<td>- 8.67</td>
</tr>
<tr>
<td>SKILLED LABORS</td>
<td>- 71.69</td>
<td>- 68.62</td>
<td>- 142.22</td>
</tr>
<tr>
<td>TOP MANAGEMENT</td>
<td>- 7.95</td>
<td>- 8.06</td>
<td>- 25.75</td>
</tr>
<tr>
<td>ENTREPRENEURS</td>
<td>- 7.95</td>
<td>- 8.06</td>
<td>- 15.86</td>
</tr>
<tr>
<td>Weighted average real inc. changes</td>
<td>- 49.37</td>
<td>- 59.46</td>
<td>- 99.54</td>
</tr>
<tr>
<td>Total real income changes</td>
<td>- 296.23</td>
<td>- 356.74</td>
<td>- 597.25</td>
</tr>
</tbody>
</table>

Source: Compiled from three different runs of the G.E. model. An inequality index of one is used in the above analysis.

Based on the above analysis, it can be seen that the imputation system is the most progressive in terms of the tax burden distribution. This is presumably because of the direct nature of the tax, i.e. the tax is being imposed on the households sector themselves. The classical system has been shown to be the worst. The difference in effect between the three systems of corporate taxation were mild.

\[43\] If we assume that firms sectors are still as capable of shifting corporate taxes as commodities taxes into the market, distribution impact will then be influenced by the consumption of goods that have a large proportion of capital services input.
IV. CONCLUSION FROM THE ANALYSIS OF THE FORM OF CORPORATE TAX SYSTEM

Overall, we can safely conclude that the imputation tax systems is relatively superior compared to the other two systems of corporate taxation discussed above. It promises to generate a relatively more favourable impact, at least in terms of efficiency as well as income distribution. The system also guarantees a mild effect on prices, demand/supply and output changes. Pure corporate tax system, on the other hand, is superior in terms of tax revenue generation.

If tax productivity is the more important criterion in selecting the system of corporate taxation, then pure corporate tax system should prevail. On the other hand, if income distribution objective is stressed, the imputation system would be the best.

7.6. COUNTER PROPOSAL OF THE INITIAL CORPORATE TAX REFORM PROPOSAL

To achieve the objective of minimising the cost of doing business and at the same time improving the performances of the tax system in Malaysia, we should explore other tax instruments currently available in the market which are relatively less efficient, more regressive and also less productive but also affect business in Malaysia. Looking back at the general findings discussion in Chapter Five, we could immediately identify Payroll tax or contribution by employers into the Employees contribution funds as one of the most logical candidates. The tax is rather progressive compared to the Corporate tax system.
It must be stressed again that the Payroll tax here is in effect a forced saving imposed on the wage earners instead of a tax instrument that raises finances for a public good. The EPF is actually an instrument to smoothen the consumption of households and to act as a provision for future consumption.

In our model, however, EPF collections had been assumed to be part of the Treasury's source of income, based on the past practice of the Treasury who utilise most (if not all) of the EPF collection to finance the development expenditure through the issuance of government securities. We also observed that there is a non-tax revenue source of the government which exactly matched the EPF collection in 1988. This helps us to balance the benchmark data set. We must therefore be very cautious in interpreting the impact of a change in either the Payroll tax or the EPF in our analysis, even though the result does seem to have fitted nicely into the Malaysian scenario.

Unlike Corporate tax, which affects investors directly, Payroll tax only affects firms. It actually reduce the profitability of firms sector and therefore would indirectly affect the investors.

We attempted the analysis, by comparing the impact of reducing Corporate tax rate and the Payroll tax at equal tax revenue loss\textsuperscript{44}. We chose to compare the impact of reducing Employee Provident Funds (EPF) contribution of employers from the current statutory requirement of

\begin{equation}
\text{Based on the potential tax revenue impact as a result of the 1\% increased in each of the tax instrument, we extrapolated the tax rate changes needed under both systems to achieve the same amount of tax revenue change.}
\end{equation}
11% to 6%. This is equivalent to reducing the corporate tax rate by 2.4712%.
## TABLE 7.6.

**COMPARATIVE IMPACT OF CORPR. AND PAYROLL TAX REFORMS PROPOSAL**

<table>
<thead>
<tr>
<th></th>
<th>2.4712% DROP IN CORP. TAX</th>
<th>5% REDUCTION IN PAYRL. TAX</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. POTENTIAL IMPACT ON TAX REVENUE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of national income (tax revenue loss)</td>
<td>0.785%</td>
<td>0.786%</td>
</tr>
<tr>
<td>in M$ millions</td>
<td>M$751.34b</td>
<td>M$752 m</td>
</tr>
<tr>
<td>Optimistic estimates</td>
<td>M$125.14b</td>
<td>-</td>
</tr>
<tr>
<td>Tax rev. loss per M$ of prvt. welf. gains</td>
<td>M$ 0.823</td>
<td>M$ 0.575</td>
</tr>
<tr>
<td><strong>B. POTENTIAL EFFECT ON EFFICIENCY</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Real national income changes in M$mill</td>
<td>M$+157.13</td>
<td>M$+192.0</td>
</tr>
<tr>
<td>Public utility loss in M$ millions</td>
<td>M$-1,070</td>
<td>M$-1,1115</td>
</tr>
<tr>
<td>Prvt. welf. gains per M$ of tax revenue loss</td>
<td>M$+0.015</td>
<td>M$+0.019</td>
</tr>
<tr>
<td>Prvt. welf. gains per M$ of tax rev. loss</td>
<td>M$+1.215</td>
<td>M$+1.738</td>
</tr>
<tr>
<td>Prvt. welf. gains per M$ of pb. util. loss</td>
<td>M$+0.853</td>
<td>M$+1.1722</td>
</tr>
<tr>
<td><strong>C. POTENTIAL IMPACT ON INCOME DISTRIBUT.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Informal labors (increased)</td>
<td>M$ 262.7m</td>
<td>M$ 93.5 m</td>
</tr>
<tr>
<td>Unskilled labors</td>
<td>M$-139.1m</td>
<td>M$526.7 m</td>
</tr>
<tr>
<td>Semiskilled labors</td>
<td>M$ 12.6m</td>
<td>M$161.5 m</td>
</tr>
<tr>
<td>Skilled labors</td>
<td>M$ 334.4m</td>
<td>M$105.4 m</td>
</tr>
<tr>
<td>Top management</td>
<td>M$ 161.6m</td>
<td>M$ 87.7 m</td>
</tr>
<tr>
<td>Entrepreneurs</td>
<td>M$ 280.7m</td>
<td>M$332.6 m</td>
</tr>
<tr>
<td>(in real income changes)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total private welfare gains</td>
<td>M$ 912.9m</td>
<td>M$1,307 m</td>
</tr>
</tbody>
</table>

Source: Compiled from the results of the G.E. analysis
Table 7.6 presents the comparative impact of reducing the two tax instruments rates by maintaining the total potential tax revenue loss.

Payroll tax directly made wage rates higher by 11%, at the current statutory rate. A 5% reduction in the rate would either increase firms profitability rates because of the cost reduction, or reduce market price of goods and services in the market. In the case of profitability rate improvement, this leads to increased investment into the sector. The latter reaction would subsequently increase demand and supply in the market in most goods that are relatively elastic in prices. Regardless this reaction, it provides a stimulant to industrial growth in the economy. The tax reduction could also be passed back to the labour group in terms of a wage rate increase. This makes the households groups relatively richer and able to demand more goods and services in the market. This strategy would have exactly the same effect as the original proposal of dropping the corporate and development tax rates\textsuperscript{45}. The proposal would be expected to improve efficiency as it reduces or abolishes a saving distortion in the economy and leaves to the households the decision about saving and investment.

The strategy of reducing payroll tax by 5% would have cost the Treasury M$ 752 million in terms of tax revenue forgone (or forced saving foregone). The net welfare gains in the economy would have been M$ 14 million\textsuperscript{46}. The households sector would have gained M$

\textsuperscript{45} in terms of its effect on the profitability ratio of the firms sector and providing incentive for investment.

\textsuperscript{46} Calculated based on the net welfare loss that could
1,307 million from the increased real income as a result of the drop in payroll tax rate. Tax revenue loss per M$ of private household welfare is therefore M$ 0.575, which means, for every dollar of tax revenue foregone, the private households would have gained by M$ 1.739. This is higher than in the case in the corporate tax reduction (M$ 1.214).

In terms of tax burden distribution however, the result would have been worse than for Payroll tax as this latter tax instrument is marginally better than the corporate tax in terms of its effect on equity distribution.

Bear in mind that our analysis of Payroll tax is just partial. In the model, we could only show the effect of the payroll tax on the employers or the firms sectors. The portion of payroll tax contributed by the employees was grouped together as part of income taxes on each of the household groups. To gauge the full effect of payroll tax, we need to look into the effect of income taxes. An estimate from this effect gives the payroll tax effect47.

Income taxes were harsh on the private household groups. Substantial welfare loss was suffered by the groups. It would be expected that half of these welfare loss were due to payroll tax paid by them (as employees had to contribute about 9% of tax, and the average income taxes is only about 18%). This would mean that M$ 850 million welfare loss could be spared by dropping the tax rate on payroll tax by 5% on employees as well. This have been avoided by reducing the tax rate.

47 That is, if we want to reduce the contribution of employees as well.
to be forgone in terms of employee contribution.

There are however a few potential drawbacks of this strategy;

* Firstly, the tax reduction would have resulted in a drop in the forced saving of the households sectors in future. In the long term, this could affect the level of investment in the economy as well as on future consumption. This would also work against the policy of promoting saving and investment in the economy. An alternative strategy could be developed to promote voluntary saving by the household sectors, provided that the tax reduction benefit is passed back on to the labour groups.

* Secondly, the strategy will not create an obvious impact on the business environment as, unlike corporate tax which is always taken as the yardstick for measuring competitive business environment, employee provident funds (or payroll tax) have always been regarded as the hidden costs of doing business in Malaysia. In terms of efforts to promote foreign investment, this strategy is not appealing.

7.7. CONCLUSION

Based on the analysis above some conclusions can be drawn on the potential impact of the 10% tax rates reduction in the Corporate tax. First, the reduction in tax rates would cause capital income to rise. Some of the rise will be passed to the firms which means a drop in the profitability ratio of the firms. This indicates some possible forward or backward shifting that would occur on the benefit from the tax rates reduction. It also
indicates some possible welfare loss from the exercise.

Secondly, the prices of most goods and services will rise marginally in most cases, especially manufacturing durable and primary commodities. The increased primary commodities prices will show some positive improvement as the commodities are for export.

Wage rates of the informal labours and the two top brackets groups would rise substantially, which could explain the backward shifting of tax benefit. The wages of the other three labours groups would fall quite drastically, mostly as the result of contraction in the demand for their services by the public sector. Demand for labours services would drop overall. This reflects the potentially serious effect on the welfare of the households groups.

Foreign exchange rates are expected to increase. The price of imported goods rose as a result of the tax rates reduction showing some potential drawback effects.

Tax revenue will fall drastically due to reduced in the tax rates. Tax collection dropped by about 41% even though the tax rates only dropped by 10% (from 45% to 35%). The extremely sensitive nature of the tax on revenue productivity is evident.

Welfare loss of the economy from tax rates reduction will be quite significant. Only if the welfare of the private households is taken into account, can the

\[48 \text{ Or 15.337\% based on the more optimistic estimates.} \]
of the private households is taken into account, can the economy experience a net welfare gain of M$ 3,694 million which is quite significant. In terms of distributional impact, the tax rate reduction will result in a somewhat progressive impact.

On the comparison between the different forms of the corporate tax system, the Imputation tax system is still relatively superior in terms of efficiency and equity distribution.

In our attempt to offer a counter proposal, we recommended an alternative strategy of reducing Payroll tax on the employers which would reduce the cost of doing business in Malaysia. This strategy is superior compared to the original proposal of reducing the corporate tax rate, especially in terms of economic efficiency and tax revenue impact.

The sensitivity analysis conducted by varying the income elasticities of the public and foreign sectors shows that the effect and impact are expected to be more extreme where the public and foreign sector are allowed to convey their income response and when they are not allowed to respond at all. The base case result (where we only allow the public sector to provide their income response) was the most moderate. This makes our results somewhat more reliable than the other two cases. The difference between the three results in the three cases was not very significant, which allows us to generalise the result using the base case.

In conclusion, reducing the corporate tax rate by 10% would be desirable only if the Treasury could find an
alternative source of revenue without affecting the efficiency and equity distributional position in the economy. This is a very difficult task as Corporate tax is one of the most efficient and progressive tax in the economy. In fact, the impact of increasing tax rates on corporation tax would be more preferable.

A good compromise in the reform effort would be to retain the rate but to switch from the current imputation system to the pure corporate tax system. We could at least expect some improvement in tax productivity from this change.

Finally, it must be stressed that, the model used in the study was probably incapable of capturing all disincentive effects that occurred in taxation. This limitation should be taken into account before a harsh judgement is levied against the reform proposals.
CHAPTER 8
RESEARCH CONCLUSION

8.1. INTRODUCTION

This final chapter reiterates the discussion about the findings of the research, particularly the effort in evaluating the major agenda in the 1988 Malaysian tax reform. It closes by identifying some of the potential areas of research which could extend the path taken herein. To strengthen the findings made in this research, we attempted a sensitivity analysis of the parameters, particularly the substitution elasticities of the households sector. The findings of this analysis are in Appendix E.

8.2. SUMMARY RESULTS OF THE TAX REFORM EVALUATION

Quite recently, much attention has focused on the problem of defining, given an existing tax system, welfare improving tax movements labelled in the literature as 'The direction of tax reform' (see Guesnerie, 1977). Tax reform recommendation therefore would, in certain circumstances, be contradictory to the theory of optimal taxation, but would be quite well suited for a particular economy under review.

The tax reform evaluation and the counter proposals presented here were done so with the above premise about optimal taxation in mind coupled with certain guidelines about the impact and effect created by certain type and classes of tax instruments. The discussion blends and integrates the result of tax instruments analysis based
on the General Equilibrium results described earlier. The counter proposal aims to further enhance the optimality criterion of the tax system.

As a starting point in the analysis, we pinpoint the fallacy of efficiency tax theory by exposing the potential impact and effect of Lump sum tax in an economy that is not currently in optimal position. Lump sum tax has often been regarded as the standard yardstick of an efficient tax instrument. As shown from our general equilibrium analysis, Lump sum tax created some negative efficiency effect, which is worse when compared to most tax instruments available in the economy\(^1\). This is largely due to the distortion and welfare burden it imposed on the private households in the economy. This is in basic contradiction with theory's claims that Lump sum tax is the most efficient tax instrument in a tax system. It is however quite easy to explain this phenomenon as in our model, Lump sum tax was immediately inserted into the economy which is in a second best position. The economy is facing an array of multitude of distortion relationships between its components. We must conclude that under the second best situation, what would be considered best might not necessarily perform as expected and vice versa.

The research focused on the evaluation of two basic reform proposals, namely the reform in the corporate tax and the possible introduction of Value-Added tax to replace the Manufacturing General Sales tax system. All other reform proposals attempted either directly or indirectly as the discussion goes on. Below is a summary of the findings made in the evaluation effort described.

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\(^1\) Except for beverage and tobacco and payroll taxes.
I. RECOMMENDATION FOR THE REFORM IN THE TAXATION OF BUSINESSES IN MALAYSIA.

The 1988 Malaysian tax reform proposals recommended that business taxes be reduced to create a better, more competitive business environment in Malaysia especially to attract foreign investors into the country. The proposal was advanced as tax strategies were required to correct the disincentives in the system. It was recommended that the corporate tax rate be reduced from 45% to 40%. Besides, development tax, an instrument used to collect additional tax from business income and rental sources\(^2\) had also been proposed for abolishment. These two major proposals would effectively reduce business rate, particularly the corporate tax rate, by about 10%.

It was predicted that the proposals would create a more suitable and competitive business environment\(^3\), making Malaysia a more attractive investment ground. They would lead to a more efficient economy and, in the long run, would produce more tax revenue from the expansion of the business sector in the economy.

Corporate tax, under the current imputation system, effectively imposed tax on the shareholders as the final claimant of corporation. The instrument has been found to be quite efficient, tax productive as well as progressive

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\(^2\) Which has also been targeted basically at the corporate sector and other business activities in the economy.

\(^3\) In relation to what has been offered by the neighbouring countries.
in nature. A crude observation is that, a reduction in the corporate tax rates would worsen the state of the economy. This is of course assuming that the reform does not generate any positive effect on the business environment and does not produce the booming effect anticipated in the industry.

To project the impact of a tax rates reduction on the business environment, we could observe the impact on price changes, demand/supply and output of industry.

The Corporate tax reduction would have caused prices of most goods to rise in the market slightly. At the same time, wage rates of most labour groups would have risen quite substantially. As corporate tax is imposed on the household sectors as being the owner of capital, the tax reduction reduced their expectation on the return on their capital. Households shifted some of

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4 All criteria that form the crucial element of a desired tax instrument in an economy like Malaysia, as stated in the tax reform objectives.

5 In relation to the three basic objectives above.

6 This of course assumed that there was no new investment and firms did not stock or unstock investment as a result of the tax rate reduction. This assumption is pertinent under the static general equilibrium model used in this study.

7 Even though in the case of household services, investment goods and other services, the tax rate reduction caused market prices to decline quite substantially.

8 Except in the case of unskilled and semiskilled labour groups who are largely employed by the public sector. Wage rates dropped as a result of the decline in the public sector expenditure due to the tax revenue reduction.

9 Or regarded as the firms profitability ratio in our model. In our model all firms' profit is due to the capital owners or shareholders.
the tax reduction benefit backward to the firms. However as, wage rates had risen and prices of goods had declined substantially in some cases, it had resulted in a lower overall profitability ratio. Individual households would have enjoyed some welfare gain as a result of the corporate tax rate reduction. This is at the expense of the public utility loss from the public expenditure cut. The net result would have been an overall net welfare loss of M$ 45 million experienced by the economy\textsuperscript{10}. Coupled with it, the tax revenue drop would have resulted in a big cut in the public expenditures which could have affected the demand for goods produced by the firms sectors\textsuperscript{11} besides the adverse effect on the wage rates described above.

Our analysis also found that Corporate tax is one of the most efficient and productive taxes in the economy. It means that, emphasising the tax would actually promote more efficiency in the economy overall\textsuperscript{12}, and at the same time collect ample tax revenue for the economy\textsuperscript{13}.

\textsuperscript{10} The more pessimistic estimates of the tax revenue loss would be about M$ 3,048 million. The private household sectors would be the major beneficiary of this tax cut. They would have gained M$ 3,694 millions in terms of welfare gain. The public sector would lose about M$ 4,327 million in terms of public utility because of the tax revenue loss and public expenditure cut caused by it. This gives a welfare loss of M$ 633 million.

\textsuperscript{11} Especially the manufacturing durables, investment goods and other goods market

\textsuperscript{12} Assuming that we increase the rate on corporate tax, and at the same time repeal some of the inefficient and unproductive taxes from the economy.

\textsuperscript{13} In relation to the other unproductive tax instruments.
Corporate tax is also equitable, in that it distributes the tax burden progressively as shown in Table 8.1. This means that, even on social and equity grounds, there is no clear justification for reducing the corporate tax rate.

What could we do then to counter propose this? To improve tax productivity as well as efficiency further, we could change the corporate tax system from the present imputation system to a pure corporate tax\textsuperscript{14}. This could be implemented simply by abolishing the current dividend tax credit system, making the tax on the corporate or firms sector final tax. This would help the Treasury in abolishing the necessary refund to the shareholders with tax brackets lower than the corporate tax rate. Table 8.1. shows that the present imputation system is relatively more equitable. The system generates more revenue in relation to private utility loss. The impact on income distribution is the mildest. The only inferior character of the imputation system is, it is less productive in nature compared to the pure corporate tax.

An alternative strategy of reducing payroll tax by 5\% was proposed. The strategy was evaluated and found to be superior in terms of efficiency and tax revenue impact. A 5\% drop in the Payroll tax would be equivalent to a 2.47\% drop in the Corporate tax rate in terms of tax revenue loss. In terms of tax burden distribution however, the strategy is slightly inferior.

\textsuperscript{14} i.e. a tax on the firms' use of capital cost instead of a tax on the shareholders' earnings of capital income.
### TABLE 8.1.

**COMPARATIVE IMPACT OF THE POSSIBLE FORM OF CORP.TAX SYSTEM**

<table>
<thead>
<tr>
<th>A. IMPACT ON TAX REVENUE (GAINS)</th>
<th>PURE CORP.TAX SYSTEM</th>
<th>IMPUTATION TAX SYSTEM</th>
<th>CLASSICAL TAX SYSTEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of national income</td>
<td>0.3309</td>
<td>0.3178</td>
<td>0.5782</td>
</tr>
<tr>
<td>in M$ millions</td>
<td>316.8</td>
<td>304.1</td>
<td>553.6</td>
</tr>
<tr>
<td>Tax rev.gain/prvt.welf.loss</td>
<td>0.6628</td>
<td>0.8239</td>
<td>0.7448</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B. IMPACT ON EFFICIENCY (MILLS)</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Real national income change</td>
<td>M$-37.49</td>
<td>M$-62.94</td>
<td>M$-108.41</td>
</tr>
<tr>
<td>Public sector utility loss</td>
<td>M$-515.45</td>
<td>M$-432.04</td>
<td>M$-851.68</td>
</tr>
<tr>
<td>T.welf.loss/ Tax rev.gains</td>
<td>-0.1183</td>
<td>-0.2070</td>
<td>-0.1958</td>
</tr>
<tr>
<td>Prvt.welf.loss/Tax rev.gains</td>
<td>-1.5096</td>
<td>-1.2129</td>
<td>-1.3426</td>
</tr>
<tr>
<td>Prvt.welf.loss/pb.util.gains</td>
<td>-0.6628</td>
<td>-0.8239</td>
<td>-0.7448</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C. IMPACT ON INCOME DISTRIB.</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Informal labour (in M$ mill)</td>
<td>-117.67</td>
<td>-108.24</td>
<td>-214.39</td>
</tr>
<tr>
<td>Unskilled labours</td>
<td>65.65</td>
<td>58.05</td>
<td>108.28</td>
</tr>
<tr>
<td>Semis-killed labours</td>
<td>-52.43</td>
<td>-4.04</td>
<td>-11.55</td>
</tr>
<tr>
<td>Skilled labours</td>
<td>-129.40</td>
<td>-135.18</td>
<td>-268.19</td>
</tr>
<tr>
<td>Top management</td>
<td>-128.64</td>
<td>-65.50</td>
<td>-129.62</td>
</tr>
<tr>
<td>Entrepreneurs</td>
<td>-115.48</td>
<td>-114.19</td>
<td>-227.80</td>
</tr>
<tr>
<td>( in real income changes )</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total private welfare gains</td>
<td>-477.96</td>
<td>-369.10</td>
<td>-743.27</td>
</tr>
<tr>
<td>Weighted total at A.I.F.(1)</td>
<td>-356.74</td>
<td>-296.23</td>
<td>-597.25</td>
</tr>
</tbody>
</table>

Source: Compiled form the results of the G.E. analysis

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II. EVALUATION OF THE REFORM PROPOSALS IN INDIRECT TAXES

A few proposals were put forward in the 1988 tax reform agenda for indirect taxes. The most significant one was the total conversion into the Value-Added tax system to be collected at the retail level. As a short term measure, proposals were also made to raise the sales tax statutory rate from the present 5% to 10% (double the present rate).

Several additional measures were also advocated in relation to Excise tax, export and the import taxes. These measures were outside the scope of Value-Added tax. In Chapter five, we evaluated the minor reform strategies before focusing on the Value-Added tax conversion, specifically in Chapter 6.

A. SALES TAXES REFORM

Instead of increasing the general rate by a blanket 5%, we evaluated each of the tax instruments available in the current system of Manufacturing Sales taxes and recommended the following strategies:

i. SALES TAX ON CLOTHING AND FOOTWEARS

It was proposed that the tax rate be increased from the current effective rate of 3.4% to 6.6%. This will increase tax revenue by M$ 181 million, while at the same time improve efficiency (worth M$ 200 million).

ii. SALES TAX ON MANUFACTURING DURABLES

A recommendation to increase the effective tax
rates from the present 3.15% to about 6.8% was made. This will increase tax revenue by M$ 990 millions, while also increase economic efficiency (worth M$ 649 million). Caution was noted with this particular instrument as, manufacturing durables are normally considered part of investment goods and will indirectly determine the standard of living in an economy.

B. PRIMARY COMMODITIES TAXES REFORM

Two instruments are involved here, one targeted at the producers and the other targeted at the international economy as the consumers.

i. EXPORT TAX ON PRIMARY COMMODITIES

As this instrument is inferior compared to the producers tax, even though they face the same tax base, the tax should be abolished. This could be done in stages. The tax revenue loss could be recovered, for example, from the tax rate increase on producers. This strategy would not only result in a more productive instrument, but also greatly increase efficiency in the economy. Income distribution is also expected to improve as a result of this strategy.

ii. PRODUCERS TAX ON PRIMARY COMMODITIES

As the tax is quite efficient and relatively productive, it should be exploited to exhaustion. Concern was voiced by the Tax Reform Group on the regressive

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15 As the expected marginal public utility increase as a result of the tax rate increase is still positive.
16 The efficiency increase would be more than 132%, while the tax revenue increase would be 35.5%.
impact of this tax instrument. More than 50% of the primary commodities producers are regarded as small scale in nature and inefficient. Effort must be made to exclude them from the tax base by creating specific channels of marketing for them or other means. If this could be achieved, then the tax instrument would be ideal.

C. IMPORT TAX REFORM

A proposal was made to abolish most, if not all, of the exemptions under the present system was made. Most 'other goods' classification were exempted for one reason or the other. Abolishing the exemption means that the effective tax rate on other goods would rise. In response to this proposal, we recommended that the import tax on manufacturing durables be abolished, and the revenue loss be compensated by increasing the tax base on other goods. It was shown that this strategy would improve economic efficiency and tax revenue\(^\text{17}\), even though the amount is not very substantial.

III. PROPOSALS TO CONVERT THE PRESENT MANUFACTURING SALES TAXES INTO THE VALUE ADDED TAX SYSTEM

Even though this reform was suggested as a long term strategy, its implementation could be commissioned sooner if the Treasury is certain of its superiority compared to the current Manufacturing Sales tax. The Treasury's reluctant attitude in pursuing this proposal is mainly due to discouraging political pressures. This is because of the uncertainty in the impact of

\(^{17}\) In terms of reducing the welfare loss, it equal 4.25% of the present position. In terms of tax revenue improvement, tax revenue will rise by 1.57%.
introducing the tax system, judging from the experience of Indonesia and partly the Philippines.

The most convincing argument for Value-Added tax is its potential role in solving the cascading or snowballing effect that exists in most general Sales tax system, especially those imposed at the manufacturers level. This is logical as Value-Added tax has only been imposed based on Value-Added created by a particular unit of production, making the total tax imposed on the consumers exactly proportionate in value to the cost of final goods. Value-Added tax will help correct this cascading distortion provided a large proportion of Industry output is used as intermediate input by other industries.

We could observe the character of the present General Sales tax in Malaysia by identifying the so-called cascading effect in the economy. If we start with the most extreme industry, i.e. other goods industry of which more than 77% of output is used by other industries as intermediate input, we could observe this cascading impact. The tax on other goods is inefficient primarily because of its impact on the real income of private households. All classes of households suffered some substantial welfare loss with the informal labours and the entrepreneurs suffering the worst effect. A tax rate increased caused prices of all goods and services in industry to drop markedly, mainly because industry reaction by contracting their output. To shift the tax burden away, producers suppressed wage rates which resulted in a wage rates drop of all labour groups, especially informal labours and the entrepreneurs. In spite of this, producers had still suffered a decline in their profitability ratio. Because of these multiple
impacts on industries, the tax on other goods was the least productive in generating tax revenue. The impact on the households sector, especially on wage rates, also resulted in a regressive impact on the equity distribution, making the tax instrument inferior in all respects.

If we compare this to the tax on clothing and footwear, of which only 11.3% of the industry output was used as intermediate goods, the impact was very much different. The tax effect was mild on the prices of all goods and services (except clothing and footwear), and on the wage rates. The tax also resulted in an increased profitability ratio of the firms and output of the industry. Overall, the tax produced some welfare gains experienced by the households sector. The tax instrument was found to be the most efficient in that it generated the minimum welfare loss on the private households per dollar of increase in public utility. In terms of distributional impact, the tax was also found to be progressive as its impact on wage rates was positive.

Among the tax instruments that exist under the General Sales tax system, the tax on household services, other goods and other services substantially affected producers as most of the products were used as intermediate inputs by other industries. Both these tax instruments were found to be inefficient and least productive in terms of tax revenue. Overall, apart from the tax on beverage and tobacco, other goods and households services, the present Sales tax system is comprised of one of the most efficient sets of tax instruments in the economy. It would be quite difficult to match these tax instruments.

The following table summarises the comparison
between General Sales tax and Value-Added tax, and compares between the three feasible types of VAT system. The assumption here is that in all the cases, the new set of uniform tax rates has been applied\(^\text{18}\).

Even though generally, Value-Added tax was introduced at higher rates than the present Sales tax system, the effect on prices was mild, even on beverage and tobacco which experienced a high tax rate increase. Wage rates of the two highest income groups and informal labours declined substantially. This was offset by the higher wage rates increase of the semi-skilled and the skilled labours groups. Firms' profitability rose marginally as a result. This stemmed from the overall increased demand and output of Industry, especially the manufacturing durables.

As can be observed from Table 8.2, in terms of tax revenue generation, even though the manufacturing Sales Tax system produced more tax revenue, the Consumption type of VAT that zero rated food items as its tax base was more productive. This is judged from the ratio of tax revenue per dollar of private welfare loss, which relates tax revenue with distortion generated onto the economy. In Chapter Six, it was shown that a Value-Added tax would generate tax revenue at a higher rate than the General Sales tax system as the tax rate is raised.

\(^{18}\) In the case of Manufacturing Sales taxes, we had extrapolated the figures based on the figures for a 1% tax rate increase impact.
# Table 8.2

<table>
<thead>
<tr>
<th>Comparative Impact of the Possible VAT Model with the GST Sys.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Income tax</strong></td>
</tr>
<tr>
<td>% of national income</td>
</tr>
<tr>
<td>in M$ millions</td>
</tr>
<tr>
<td>Tax rev. gain/pr. wel. loss</td>
</tr>
<tr>
<td><strong>Effect on Efficiency</strong></td>
</tr>
<tr>
<td>Change in real national income in M$ millions</td>
</tr>
<tr>
<td>Public utility incr.</td>
</tr>
<tr>
<td>T. wel. loss/tax rev. incr.</td>
</tr>
<tr>
<td>Pr. wel. loss/tax rev. incr.</td>
</tr>
<tr>
<td>Pr. wel. loss/pb. ut. gains</td>
</tr>
<tr>
<td><strong>Impact on Income Distribut</strong></td>
</tr>
<tr>
<td>Informal labors</td>
</tr>
<tr>
<td>Unskilled labors</td>
</tr>
<tr>
<td>Semiskilled labors</td>
</tr>
<tr>
<td>Skilled labors</td>
</tr>
<tr>
<td>Top management</td>
</tr>
<tr>
<td>Entrepreneurs</td>
</tr>
<tr>
<td>Total pr. wel. loss</td>
</tr>
<tr>
<td>Wt. total of pr. wel. loss</td>
</tr>
</tbody>
</table>

Source: Compiled from the results of the G.E. analysis.
In terms of efficiency, the superiority of the Value-Added Tax system is manifest. This is basically due to the substantial reduction in the tax rate on the Clothing and Footwear tax. General Sales tax produced the smallest welfare loss per public utility increase. The General Sales tax system generated a large public utility which made it seem like a better system when the public utility increase is accounted in our observation.

Surprisingly, the VAT system which included food as its tax base, was again the best system in terms of efficiency, when we relate total welfare loss with tax revenue. The consumption type of VAT which zero rated food items in its base was superior than the latter, based on the ratio of private welfare loss and tax revenue gains.

In terms of equity distribution, again, Value-Added Tax is clearly superior compared to the Manufacturing Sales tax system. Informal labours were substantially affected by the Sales tax compared to Value-Added tax. Based on the weighted total welfare loss\(^{19}\), we observed that the consumption type of VAT is best in terms of income distribution. General Sales tax system was again the worst.

From the above argument it is evidenced that conversion into the Value-Added tax would not only improve the overall efficiency of the economy, but also tax revenue productivity. Equally important, VAT would improve income distribution in the economy.

The analysis of the effect on price changes shown in Table 6.7., Chapter Six, showed that staying at the

\(^{19}\) Arrived at after applying the Atkinson’s inequality index of one.

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present tax rate structure, the introduction of Value-Added tax will not produce price increases. Price increases were exceptionally mild. In four of the ten cases, prices actually declined at a relatively higher rate than the price increase. When we convert to the new rate to make the rates structure more uniform, price increase was quite pertinent. This is because in six out of the nine relevant cases, tax rates had to be increased. For clothing and footwear and household services, a price decline was recorded, simply because the tax rates were reduced. What can be done to create confidence in the market is to introduce VAT by simply switching the current instruments with the VAT instruments while retaining the tax rates under the present manufacturing sales tax system. Since most Sales taxes shifted forward, the introduction will not create inflationary effects. Once the market settles, a new tax rate could be introduced. The finding above must be qualified as our model only showed results of the relative price changes rather than absolute price change.

8.6. FINAL REMARK ON THE TAX REFORM STRATEGY

The above recommendation is based on the results of the general equilibrium analysis as the base. It should be stressed that a lot of discretion was used in arriving at the strategies, as even quantitative measures could not guide us directly to the optimum choice. A lot of trade-off had to be made in selecting the combination of tax instruments changes. The main challenge is in balancing the importance of each reform objective. In some cases, efficiency criteria need to be projected, and in others equity distribution must prevail, and so

---

20 i.e. tax revenue generation, economic efficiency and income distribution.
on. The rule of thumb in the exercise was taken from Guesnerie (1977), "as long as the reform strategies resulted in 'some welfare improving tax movement', it would be considered as the right direction of tax reform".

8.4. LIMITATION OF THE MODEL AND IDENTIFICATION OF FUTURE RESEARCH

The study conducted was not without limitations and drawbacks. Some parameters had to be adopted from other studies while the benchmark data had to be modified and simplified to make the task manageable. This would not be expected to render the result as less useful. In the analysis, several steps were taken to cover the difficulties. The sensitivity analysis conducted on the substitution elasticities of households and on the income elasticities of the capital services suppliers for example, checked the sensitivity of the result to these 'borrowed' parameters. The studies found that the assumptions made on these parameters were reasonable.

The static and marginal nature could be considered to be a handicap. But, as discussed in Chapter Three, these basic assumptions were adopted with a conscious knowledge of the effect. The static nature of the model for example required a qualification of the period by which the result presented could be expected to occur. The impact and effect described above is only true between 2-3 years after the particular reform proposal is implemented. This is a reasonable period for reevaluation of reform achievement. The marginal nature of the model also was repeatedly qualified in the analysis. Our belief is that as long as the result is interpreted cautiously,
the weaknesses can be contained.

After this pioneering effort, we can identify other related topics to pursue. As the aspect of unemployment, deficit budget and deficit balance of payment is gaining importance in the analysis of public policy including public finance in Malaysia, research to build a model that is Keynesian in nature that will be able to take into account greater reforms in the tax system could be useful. A general equilibrium model that would account for the impact of investment tax incentives program would be another fertile area, especially since Malaysia is seriously promoting investment particularly from abroad in her efforts to industrialise.
APPENDIX A

BRIEF DESCRIPTION OF EACH INDIVIDUAL TAX INSTRUMENT IN MALAYSIA

To provide a complete background of the tax system it would be useful to briefly describe the mechanics or \textit{modus operandi} of each tax.

(a) PERSONAL TAXATION

Practically, this is the only true direct tax imposed in the system. Tax is imposed on all source including income from business, employment, capital income – dividend, interest and discount, rent, royalties and premiam, pensions and annuities and other gains. Income is only assessable if it is derived in Malaysia or remitted into Malaysia by a resident, whose status is determined by the length of stay in Malaysia. Exemptions are provided on a range of income including salaries paid to the royal families, allowances to member of parliaments, approved pensions, compensation for loss of office, certain interest and dividends and income of certain exempt bodies. Individual residents are granted personal reliefs and exemptions including – M$ 5,000 self relief, M$ 2,000 wife relief, child relief for the first five children under 18 ranging from M$800 for the 5th child to M$500 for the first child. A relief on the employee provident funds contribution and life insurance premium up to M$ 4,000 is also provided for a family. The assessment is on family basis where joint assessment is imposed a unless wife who hold employment or practices professionally applies for a separate assessment. A M$ 75 rebate is provided for a person with a taxable income of M$10,000 or below. The tax rate structure is as follows:

\begin{table}[h!]
\centering
\begin{tabular}{|c|c|}
\hline
Income Bracket & Tax Rate \\
\hline
0 – 5000 & 0.10 \\
5000 – 10,000 & 0.20 \\
10,001 – 15,000 & 0.30 \\
15,001 – 20,000 & 0.40 \\
20,001 – 25,000 & 0.50 \\
25,001 – 30,000 & 0.60 \\
30,001 – 35,000 & 0.70 \\
35,001 – 40,000 & 0.80 \\
40,001 – 45,000 & 0.90 \\
45,001 – 50,000 & 1.00 \\
50,001 – 55,000 & 1.20 \\
55,001 & 1.50 \\
\hline
\end{tabular}
\end{table}
### TABLE A.1

**INCOME TAX RATES STRUCTURE**

<table>
<thead>
<tr>
<th>Taxable income</th>
<th>Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>first M$ 2,500</td>
<td>at 5%</td>
</tr>
<tr>
<td>next M$ 2,500</td>
<td>at 8%</td>
</tr>
<tr>
<td>next M$ 5,000</td>
<td>at 12%</td>
</tr>
<tr>
<td>next M$ 10,000</td>
<td>at 15%</td>
</tr>
<tr>
<td>next M$ 15,000</td>
<td>at 20%</td>
</tr>
<tr>
<td>next M$ 15,000</td>
<td>at 30%</td>
</tr>
<tr>
<td>next M$ 20,000</td>
<td>at 35%</td>
</tr>
<tr>
<td>next M$ 30,000</td>
<td>at 40%</td>
</tr>
<tr>
<td>the remainder</td>
<td>at 40%</td>
</tr>
</tbody>
</table>


The structure of taxpayers in 1984/85 is as follows:

### TABLE A.2

**INDIVIDUAL TAXPAYERS STRUCTURES IN MALAYSIA**

<table>
<thead>
<tr>
<th></th>
<th>1984</th>
<th>1985</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMPLOYEES</td>
<td>646,995</td>
<td>741,336</td>
</tr>
<tr>
<td>SOLE PROPRIETORS</td>
<td>390,821</td>
<td>443,318</td>
</tr>
<tr>
<td>BUSINESS PARTNERS</td>
<td>53,699</td>
<td>59,048</td>
</tr>
</tbody>
</table>

Source: Annual Report of the Inland Revenue Department.
Income declared and tax collected on personal income tax for 1987 were as follows:

### TABLE A.3.

INCOME DECLARED AND TAX COLLECTED FOR YEAR OF ASSESSMENT 1987

<table>
<thead>
<tr>
<th>GROSS INCOME GROUP</th>
<th>no.of taxpayers</th>
<th>income taxable (in million M$)</th>
<th>income tax collected (in million M$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 7,500</td>
<td>99,102</td>
<td>629.611</td>
<td>7.126</td>
</tr>
<tr>
<td>7,501 - 10,000</td>
<td>185,399</td>
<td>1,623.226</td>
<td>33.529</td>
</tr>
<tr>
<td>10,001 - 15,000</td>
<td>265,583</td>
<td>3,312.392</td>
<td>111.123</td>
</tr>
<tr>
<td>15,001 - 20,000</td>
<td>123,016</td>
<td>2,112.919</td>
<td>110.168</td>
</tr>
<tr>
<td>20,001 - 30,000</td>
<td>88,910</td>
<td>2,151.516</td>
<td>168.870</td>
</tr>
<tr>
<td>30,001 - 50,000</td>
<td>51,427</td>
<td>1,945.632</td>
<td>224.340</td>
</tr>
<tr>
<td>50,001 - 100,000</td>
<td>20,488</td>
<td>1,359.554</td>
<td>238.916</td>
</tr>
<tr>
<td>100,001 - 200,000</td>
<td>4,470</td>
<td>583.362</td>
<td>153.921</td>
</tr>
<tr>
<td>more than 200,000</td>
<td>1,168</td>
<td>386.123</td>
<td>138.007</td>
</tr>
</tbody>
</table>

Source: Annual report of the Inland Revenue Department
(b) CORPORATION TAX.

Since Malaysia employs the complete integration method in dealing with corporation tax and personal income tax, there is practically no real tax at corporate level. Tax collected at the corporate level is merely a form of withholding tax until dividend are finally being paid to individual shareholders. However, in real terms, only about 10% of the tax collected will really be paid back to individual shareholders. The rest, indirectly became final tax as corporation reinvest their profit and realise profit as capital gains later. The tax base is the same for individuals. Business income is eligible to be offset against capital allowances based on the approved capital expenditures which is subject to "balancing charge" and "balancing allowance" (current and carry forward for unlimited period) in the case of resale of plant and machineries and "loss carry forward" (also for unlimited period). Deductions are allowable for expenses "wholly and exclusively" for the production of gross income (excluding capital expenditure). The tax rate is at 40% flat rate.

There were 84,748 and 107,896 companies which submitted assessments for the year of assessment 1986 and 1987 respectively. Beside income tax, individuals and corporations were subject to development tax on development source, i.e. business and rental and excess profit tax where ever appropriate. Companies involved in petroleum businesses are subjected to Petroleum income taxes. All these supplementary taxes have slowly been phased out of the system. Excess profit tax and Development tax is however is still being applied to individual taxpayers.
(c) REAL PROPERTY GAINS TAX.

Tax is imposed on gains or profit from real property transaction. Real property is defined as land and anything above the land. Assessment is made for each transaction involved without regard to the tax period. Exemption is given on the sale of one owner occupied house base on application. Exemption is also provided on the first 10% of gains or M$ 10,000 which ever is greater. Acquisition here is defined to include gifts and inheritance even though no tax is imposed on the transfer. Market value of property during the transfer is used as the basis of acquisition price. This tax is also applicable to corporations. The tax rate is declining by the period of holding as follows:

<table>
<thead>
<tr>
<th>Rate Structure of the Real Property Gains Tax</th>
</tr>
</thead>
<tbody>
<tr>
<td>disposal within 2 years of acquisition</td>
</tr>
<tr>
<td>disposal within 3 years of acquisition</td>
</tr>
<tr>
<td>disposal within 4 years of acquisition</td>
</tr>
<tr>
<td>disposal within 5 years of acquisition</td>
</tr>
<tr>
<td>disposal in year 6 and after</td>
</tr>
</tbody>
</table>

Source: Real Property Gains Tax Act

(d) SHARE TRANSFER TAX.

This is another transaction tax which confined itself to shares of land based companies. It originally complemented the Real Property gains tax which also deals mostly with land (real property). The tax was supposed to discourage the practice of converting
real property gains into share transfer gains which are not taxable at that moment. This was normally done by attempt to sell shares in the companies that hold the land bank instead of selling the land themselves. The tax was supposed to be punitive and imposed on the gross value of the transaction at the rate of 10%. The rate has however been reduced to 2% with effects from the year of assessment 1986. A floor is provided i.e. M$1,000,000 before a transaction is subjected to this tax. A Land base company is defined as any company with 10% or more of its assets in the form of lands. The tax was abolished in the 1989 budget proposal.

(e) DEATH AND INHERITANCE TAX

This tax is imposed on an estate belonging to a person at the point of his death as a means of redistributing wealth before it is inherited by the beneficiaries. Two separate schedules are being used to determine tax payable - one for a domiciled person and the other for a deceased person who lived somewhere else, with the rate in favour of domiciled persons. The floor limit before a deceased person being assessed is M$1,000,000 on net wealth left as estate for domiciled and M$120,000 for nondomiciled persons. Early settlement will be granted incentive in the form of rate reduction.

(f) INVESTMENT TAX INCENTIVES

Incentives were first provided in 1958 and have undergone several reforms with two major one in 1968 and 1986. It is only provided to companies who are eligible and apply for it. There are basically five forms of incentives offered namely:
* Pioneer status - for hotel and other industries.
* Investment tax allowance
* Additional Capital allowance
* Export incentives
* Additional incentives

Incentives are provided in the form of exemption from paying income taxes and tax exemption on dividend distributions resulting from it.

There have been several criticisms on this granting of incentives to investors, especially to foreigners. Criticisms include equity issues, both horizontally and vertically, the resource waste caused by the unavailability of tax sparing clauses in the double tax agreement and the tax planning opportunity created from the incentives.

The performance of these incentives programs in terms of costs involved is shown in Table A.5.
<table>
<thead>
<tr>
<th>type of incentives</th>
<th>No. of co's.</th>
<th>Total costs</th>
<th>average costs</th>
<th>Investment generated</th>
<th>employment generated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pioneer status</td>
<td>511</td>
<td>1,171,718</td>
<td>2.293</td>
<td>3,444,645</td>
<td>99,000</td>
</tr>
<tr>
<td>Investment tax allowance(spent)</td>
<td>374</td>
<td>313.132</td>
<td>0.837</td>
<td>1,784.850</td>
<td>10,500</td>
</tr>
<tr>
<td>Investment tax allowance(apprv)</td>
<td>605</td>
<td>565.655</td>
<td>0.935</td>
<td>3,196.564</td>
<td>92,800</td>
</tr>
<tr>
<td>Export incentive</td>
<td>-</td>
<td>242.423</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Reinvestment all</td>
<td>-</td>
<td>131.314</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>TOTAL EXPENDT.</td>
<td></td>
<td>2,424.242</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


(g) SALES TAX
Sales tax is being levied at the manufacturer's level under the 'ring system'. Only establishments with an annual turnover of M$ 1 million will be subjected to this tax. Exemptions are provided for manufacturer purchases (amounting to about 75% of the transaction volume). Sales tax covers imports and local manufacturing goods. The tax rate is 5%. Sales tax is administered by the Customs and Excise department.
(h) SERVICE TAX

Only establishments with an annual turnover of M$500,000 or above are required to be licenced for service tax purposes (except for hotels). The tax is chargeable on the provision of sleeping accommodation, premises for meetings, exhibitions and shows, services by health centres and massage parlours, dancing partners, social escort and tobacco sold in prescribed establishments. Restaurant and fast food businesses are also subjected to this tax. Service tax is levied at the retail level. The tax rate is at 10%.

(h) EXCISE TAX

This tax is imposed on local manufacturers for goods produced and used in manufacturing activities and also on Petroleum refineries. Tax is levied based on ad valorem as well as on unit basis. Goods covered by Excise tax are food, beverage and tobacco, manufacturing durables, petroleum products and other goods. However, the bulk of the tax was collected from petroleum products.

(i) EXPORT TAXES

This tax is levied on primary commodities that have been the traditional exports of the Malaysian economy. Beside the revenue objective, this tax is also used to regulate and stabilise the production of export commodities.
(j) IMPORT TAXES

Import taxes have been levied on three categories of goods namely processed foods, consumer durables and luxury goods. Tariff protection has also been imposed using this tax (to protect domestic industry).
APPENDIX B
RECLASSIFICATION OF SECTORS FOR PURPOSES OF GENERAL EQUILIBRIUM MODEL

There were 68 items in the rows list and 73 items in the column list of the Input Output Tables. These items had to be regrouped to fit into the 18 items on the list of the benchmark equilibrium data set accounts to be constructed. The reclassification was made resulting in the following combination of items:

1. FOOD
   This sector includes the following sectors as per input-output tables:
   - Livestock
   - fishing
   - dairy products
   - vegetables and fruits
   - Oil and fats
   - grain mills
   - baker confectionaries
   - Other food

2. BEVERAGES AND TOBACCO
   This sector includes the two items in the input-output tables as follows:
   - Beverages
   - Tobacco

3. CLOTHING AND FOOTWEAR
   This sector includes the two particular items in the input-output tables as follows:
   - Textiles
   - Wearing appliance
4. MANUFACTURING DURABLES
   This sector includes the following items on the input output tables:
   o Furnitures and fixtures
   o Non electrical machineries
   o Electrical machineries
   o Motor vehicles
   o Other transport

5. HOUSEHOLD SERVICES
   This sector includes the following items on the input output tables:
   o Electricity
   o Water
   o Hotel etc
   o Transports
   o Communications
   o Insurance
   o Dwellings

6. INVESTMENT GOODS
   This sector was represented by the construction sector with the assumption that construction industry produces everlasting assets in the form of private and public properties and development projects.

7. OTHER GOODS
   This sector includes the following items in the input output tables:
   o Animal feed
   o Sawmills
   o Paper printing
   o Industrial chemistry
   o Paints etc
o Other chemicals products
o Rubber products
o Rubber processing
o Plastic products
o Glass products
o Cements
o Non metal goods
o Basic metal
o Other metal
o Other manufacturing products

8. PETROLEUM PRODUCTS

This sector includes petroleum refinery, oil and other petroleum chemicals and petroleum downstream activities.

9. OTHER SERVICES

This sector includes the following items in the input-output tables:

o Finance
o Trade
o Business services
o Private education
o Private health
o Cultural services
o Repairs of motor vehicles
o Personal services
o Private non-profit services
o Other services
o Public administration
o Government education
o Government health
o Other Government services
10. PRIMARY COMMODITIES

This sector includes the following sectors in the input-output tables:

- Other agricultures
- Rubber plantation
- Oil palm
- Forestry
- Mining
APPENDIX C

CONTENTS OF GOODS AND SERVICES IN EACH OF THE INDUSTRY CLASSIFICATION USED IN GENERAL EQUILIBRIUM MODEL

The detailed contents of goods and services in each individual sector above is as follows:

1. FOOD - Includes coconut, tea, coffee, pepper, pineapple, permanent crops, agriculture services, pigs, cattle, poultry, milk, eggs, coconut raising, other livestock, marine and freshwater fish, other aquatic animals and plants, meats and meat products, ice cream, butter, cheese, milk and other dairy products, canned and preserved fruits and vegetables, canned, preserved and processed fish, crustacea and similar food, coconut oil, palm oil, other vegetable and animal oils and fats, rice, flour, sago and tapioca, other grain mill products, biscuits, bread, cakes, cookies and other bakery products, chocolate and sugar confectionery, ice, sugar, coffee, tea, meehoon, noodles and related products, spices and curry powder, starch and other food products.

2. BEVERAGES AND TOBACCO - includes alcoholic beverages, wine, beer and malt products, soft drinks and carbonated water, cigarettes, cigars and other tobacco products.

3. TEXTILES AND FOOTWEAR - includes yarns, cloth, synthetic fabrics, made-up textile goods, knitted fabrics, carpets, rugs, mats and twine, other textiles, ready made wearing apparel, leather and products of leather, leather substitutes and fur, footwear.

4. MANUFACTURING DURABLES - includes engines and turbines, agricultural machinery and equipment, metal and woodworking machinery, special industrial machinery- food
and textile, office, computing and accounting machinery, refrigerating, exhaust, ventilating and air-conditioning, machinery and equipment, electric motors, generators, transformers, other electrical machinery and apparatus, radio, television, semi-conductors, other electronic components, communication equipment, electrical appliances and housewares—broilers, toasters and apparatus, electrical appliances and housewares—boilers, toasters and vacuum cleaners, cables and wires, dry cells and storage batteries, electric lamps and tubes, motor vehicles bodies, assembly of motor vehicles, motor vehicles parts and accessories, assembly of motorcycles and scooters, bicycles, tricycles and trishaws, boats and ships, railroad, aircraft and other transport equipment, professional and scientific and measuring and controlling equipment, photographic and optical goods, jewellery and related articles, musical instruments, sporting and athletic goods and other manufacturing goods.

5. HOUSEHOLD SERVICES — includes real estate and ownership of dwellings, restaurants and hotels, private education services, private medical, dental and other health and veterinary services, recreational and cultural services, repairs of motor vehicles and motorcycles, personal and household services, repair services, laundries and cleaning and dyeing plants, private non-profit services, miscellaneous personal services—barber and beauty shops, photographic.

6. INVESTMENT GOODS — covers construction industry as well as actual investment in the economy.

7. OTHER GOODS — includes sawmills, manufacture of wood and cork products, furnitures and fixtures — manufacture of furniture and fixtures, paper printing — manufacture of paper and paper products, containers and
boxes of paper and paperboard, manufacture of pulp, paper and paperboard articles, printing, publishing and allied industries, industrial chemical - manufacture of industrial chemicals, synthetic resins, plastic materials and fibres, manufacture of paints, vanishes and liquers, manufacture of other chemical products, and coal, rubber processing, manufacture of rubber products, manufacture of plastic products, manufacture of pottery, china and earthenware, glass and glass products, structural clay products, cement, lime and plaster, manufacture of non-metallic mineral products, basic metal industries and manufacture of fabricated metal products, machines and equipment and manufacture of fabricated metal products.

8. PETROLEUM PRODUCTS - includes petroleum refineries, manufacture of miscellaneous products of petroleum and coal and other petroleum downstreams activities.

9. OTHER SERVICES - includes electricity, gas and steam, waterworks and supply, wholesale and retail trades, transport and storage, communication, insurance, business services - legal, accounting, auditing, data processing, engineering, architecture, advertising, machinery and equipment rental and leasing, business services. It also includes general public administration and defence - general administration, external affairs, justice and public order defence, education services - administration and research, educational services, schools, universities and educational facilities and services, health services - medical, dental, other health and veterinary services, other government services.

10. PRIMARY COMMODITIES - includes rubber planting-latex, unsmoked sheets, wet slabs, scrap, lump and bark, rubber seeds, logs of rubber trees, oil palm estates - fresh fruit bunch, kernel and nuts for
replanting, forestry and logging products, mining and quarrying—crude petroleum and natural gas, tin, iron and other metal, quarrying of stone, clay and sand.

11. CAPITAL SERVICES — includes financial institutes services—monetary and other financial institution. Income of taxpayers from capital services is obtained from the investment's income (interest and dividend) declared in the tax return as reported in the Annual Report of the Inland Revenue Department.
APPENDIX D
DESCRIPTION OF THE SPECIFIC MODEL

We only have to describe the households' and the firms' behaviour in order to describe the whole model. This is because the public and the foreign sector are treated as another household entity.

I. THE HOUSEHOLD BEHAVIOUR

Each private household (including the public and private households) is assumed to maximize a utility function subject to a budget constraint. Consumers include eight classes of individual, classified according to their income tax bracket, public sector and the foreign sector. The household-specific demand functions are given by:

\[ q_i^H = \xi_i^H p_i^H + \xi_y^H \tau \]  

... (1)

The column vector \( q_i^H \) contains the relative changes in the demands (supplies are measured negatively) of household \( i \) for all 18 goods. \( \tau \) is a scalar representing the relative change in tax revenue from transaction taxes. For public household \( \xi_y^i \) is the 18-vector of income elasticities. For the non public households, \( \xi_y^i \) is an 18-vector containing zeros and \( \xi_H^i \) is an 18 x 18 matrix of uncompensated price elasticities of household \( i \) defined as:

\[ \xi_{Hij} = \delta_j \gamma_i \gamma_j \sigma_{ij} - \delta_j \gamma_i \]  

...(2)

\( \xi_{Hij} \) - Uncompensated price elasticity of good \( i \) with respect to the after-tax price of good \( j \).

\( \delta_j \) - Income share of good \( j \).

\( \gamma_i \) - Income elasticity of good \( i \).

\( \gamma_j \) - Income elasticity of good \( j \).

\( \sigma_{ij} \) - Elasticity of substitution.
Elasticity of substitution is determined by the nested constant elasticity of substitution (CES) utility functions. This nested utility functions allow for the modelling of differentiated substitution possibilities by defining various levels of aggregates and specifying distinct elasticities of substitution between those aggregate.

The symbol $P^i_H$ stands for the 18-vector of relative changes in the after-tax prices facing household $i$. These prices are related to the relative changes in market prices, which are contained in the 18-vector $P_m$, and to the changes in the 18-vector $t$, by the 18 X 18 matrix $T^i_H$:

$$P^i_H = P_m T^i_H t \quad \ldots (3)$$

$P^i_H$ - Net prices changes after tax facing household $i$

$P_m$ - Market price changes

$T^i_H$ - Changes in the tax instruments

$t$ - tax instruments

Aggregation is made over the 8 households as follows:

$$q_H = \sum_{i=1}^{8} a^i_H q_H \quad \ldots (4)$$

$q_H$ - Relative changes in demands of the aggregate household sector (18-vector).

$a^i_H$ - Shares of household sector $i$ in aggregate household demands on (a diagonal 18 X 18 matrix).

When we substitute (1) and (3) into equation (4),
under the static equilibrium analysis where future consumption is assumed to be zero, the aggregated household net demand function is:

\[ q_H = \xi_{HM} P_M + \xi_{HT} t + \xi_Y \tau \]  
...(5)  

with,

\[ \xi_{HM} = \sum_{i=1}^{18} \hat{a}_H \xi^i_H \]  
...(6)  

\[ \xi_{HT} = \sum_{i=1}^{18} \hat{a}_H \xi^i_H \tau^i_H \]  
...(7)  

\[ \xi_Y = \hat{a}_H \xi^p \]  
...(8)  

The superscript p represents the public household.

- \( q_H \) - Aggregated net demand of household
- \( P_M \) - Changes in market price
- \( t \) - Vector of tax rate
- \( \xi_Y \) - Income elasticity
- \( \tau \) - Total tax revenue
- \( \hat{a}_H \) - Share of household net aggregate demand
- \( \xi^i_H \) - Price elasticities of household
- \( \xi_{HM} \) - Aggregated price elasticities of household
- \( \xi_{HT} \) - Aggregated tax-elasticities of household
- \( \xi^i \) - Vector of income elasticities

2. PRODUCTION (FIRM) SECTOR

The model includes 18 goods: 10 production goods, 2 non-consumption demand (public and foreign), 8 factors of production and 6 private household or final consumers.
All the 10 goods and services produced by the firms sectors were partly formed as intermediate goods and partly formed the final goods. Import had been assumed to be totally used as input of the firms sector. The foreign sector was assumed to have generated the import just as the firm sector generated goods and services into the economy.

The input-output matrix includes 12 activities of which 10 employ the factor of production\(^1\). The import and capital services sector only supplies goods and services and does not use any goods and services as factors of production. Import was assumed to have been generated by the foreign household, while capital services were generated by the private households who owned capital. The matrix includes a 12 X 12 input output matrix that gives intermediate transactions for the 10 production sectors and two non-consumption demand sectors labelled as \(A\). It also has a 12 X 10 matrix that converts demand for final consumption goods into demand for production goods labelled as \(Z\), a 10 X 10 matrix with total consumption of consumption goods on the diagonal labelled as \(D\) and zero elsewhere. The input output table looks like the following:

\[
\begin{bmatrix}
B & = & A & -Z \\
\; & = & 0 & D
\end{bmatrix}
\]

Producers include primary product producers, natural resources extractors, producers of intermediate products and final goods producers.

---

\(^1\) Except in the case of household services and the investment goods sector, which does not import any goods or services.
The column vector $q^*_F$ contains the relative changes in the supplies (demands are measured negatively) of firm $j$. The firm-specific supply functions are given by:

$$q^*_F = \xi^*_F + v q_{sj}$$  \ ...(9)$$

$q_{sj}$ - Output level of firm $j$
$v$ - 18-vector that consists of unit elements
$\xi^*_F$ - $18 \times 18$ matrix of uncompensated price elasticities for firm $j$.
$P^*_F$ - 18 vector of the relative changes in after-tax prices facing firm $j$.

Uncompensated price elasticities for firm $j$ were defined as follows:

$$\xi_{ij} = \zeta_j \sigma_{ij}$$  \ ...(10)$$

$\xi_{ij}$ - Price elasticity of good $i$ with respect to after-tax price $j$, defined at a constant output level.
$\zeta_j$ - Cost share of good $j$
$\sigma_{ij}$ - Elasticity of substitution

The relative changes in after-tax prices facing firm $j$ ($P^*_F$) are related to the tax instruments by the $18 \times 18$ matrix $T^*_F$.

$$P^*_F = P^*_m + T^*_F t$$  \ ...(11)$$

$T^*_F$ - $18 \times 18$ matrix of tax instruments.
$t$ - 18-vector of tax instruments.
The zero-profit condition for firm j is described by:

\[ \zeta_j F P_j^F = 0 \quad \text{...(12)} \]

Here \( \zeta_j F \) is the 18-vector of cost shares of firm j.

\( q_F \) is an 18-vector contains the relative changes in supplies of the aggregate production sector, which is found by aggregating over the 10 firms:

\[ q_F = \sum_{j=1}^{10} \hat{a}_F^j q_F \quad \text{...(13)} \]

Here \( \hat{a}_F^j \) represents a diagonal 18 \( \times \) 18 matrix with the shares of firm j in aggregate firm supplies on its diagonal.

Using equations (9), (11), (12) and (13) allows us to aggregate firm's behaviour under a static analysis of general equilibrium, the aggregate firm's behavior is described by:

\[ q_F = \zeta_{FM} P_M + \zeta_{FT} t + A_F q_s \quad \text{...(14)} \]

\[ 0 = \zeta_{FM}' P_M + \zeta_{FT}' t \quad \text{...(15)} \]

with,

\[ \zeta_{FM} = \sum_{j=1}^{10} \hat{a}_F^j \zeta_j F \quad \text{...(16)} \]

\[ \zeta_{FT} = \sum_{j=1}^{10} \hat{a}_F^j \zeta_j T_F \quad \text{...(17)} \]

and for jth column,
\[ C_{FM} = C^j_F \] ...(18)

\[ C_{FT} = ( T^j_F ) C^j_F \] ...(19)

\[ A^j_F = a^j_F \] ...(20)

\( A^j_F \) is the 18-vector with share of firm \( j \) in aggregate firm supplies.

- \( q_F \) - Changes in the net quantity demanded
- \( P_M \) - Changes in market price
- \( t \) - Changes in tax instrument
- \( a^j_F \) - Firms share in aggregate quantities demand
- \( \xi^i_F \) - Price elasticities of firm
- \( \xi_{FM} \) - Aggregated price elasticities of firm
- \( \xi_{FT} \) - Aggregated tax-elasticities of firm
- \( A_F \) - Matrix of firm's shares in aggregate quantities
- \( q_s \) - Firm's output levels
- \( C^j_F \) - Vector of cost shares of firm sector

3. SOLUTION TO THE MODEL

The model could either be solved with the Scarf Algorithms (1969) i.e. using a fixed point algorithms or using the Newton-type procedures, which is based on a linear approximation of various kind. The model here used the latter approach. The method can be described simply by successively varying each price by a small amount and noting the pattern of changes in excess burden, tax revenue and tax burden under a new equilibrium. This linearization assumption will normally result in a discrepancy in the result between the two
methods of solution. The basic limitation of this type of solution is that it can only deal with a small change in tax rates, tax base and rules.

To arrive at a closed-form solution for the aggregate firm sector, the 10-vector which contains the output levels of the firms, is eliminated from equation (14) to arrive at $18 - 10 = 8$ equations in $q_F$. Together with equation (15), these equations yield 18 independent equations for the aggregate production sector. These equations could be combined into a single system of equations:

$$M_{FF} q_F = M_{FM} q_M + M_{FT} t \quad \ldots (21)$$

The overall comparative-static results and the equilibrium condition are:

$$q_H = \xi_{HM} q_M + \xi_{HT} t + \xi_Y t \quad \ldots (22)$$

$$M_{FF} q_F = M_{FM} q_M + M_{FT} t \quad \ldots (23)$$

$$\omega_P q_M = 0 \quad \ldots (24)$$

$$q_H = q_F \quad \ldots (25)$$

Combining the equations for the aggregate household and production sectors with equilibrium condition

$$q_H = q_F$$

and fixing the world price of the foreign good allows us to solve for the price-vector $P_M$ and total tax revenue.

The comparative static solution is derived using Walras Law. Walras' law is used for the determination of the complicated variables in the model i.e. total tax revenue. This determines the change in the total tax revenue given clearing of all markets.
The computational procedures could be described as follows:

a. Determination of exogenous parameters.

The exogenous parameters which must be obtained from the initial situation (before the tax reform) are:

- $\hat{a}_R$ - Share of household net aggregate demand
- $\xi^i_H$ - Price elasticities of household
- $\beta^i_{HM}$ - Relation between net household price and market prices
- $\gamma^i_R$ - Relations between transfer received and total tax revenue.
- $\gamma^i_T$ - Relation between transfer received and the vector of tax instruments.
- $\xi^i$ - Vector of income elasticities
- $\hat{a}^i_F$ - Firms share in aggregate quantities demand
- $\xi^i_F$ - Price elasticities of firm
- $\beta^i_{FM}$ - Relation between net firm's prices and market prices
- $\beta^i_{FT}$ - Relation between net firm's prices and taxes
- $\xi^i_{FM}$ - Aggregated price elasticities of firm
- $\xi^i_{FT}$ - Aggregated tax-elasticities of firm
- $A$ - Matrix of firm's shares in aggregate quantities
- $C^j$ - Vector of cost shares of firm sector
- $\omega$ - weight determining average price level in terms of which transfer is expressed.

b. Computation of:

- $\xi^i_{HM}$ - Aggregated price elasticities of household
- $\xi^i_{HT}$ - Aggregated tax-elasticities of household

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\( \xi_Y \) - Income elasticity

c. Solving for;

PM - Changes in market price

\( \tau \) - Changes in total tax revenue

d. Finally directly calculating individual and aggregate tax burden as follows:

Changes in individual and aggregate excess burden (welfare loss), can be calculated as follows:

\[
\varphi^i = -\lambda^i + C^i_{H} p^i_h 
\]

\[
\varphi = \sum_{i=1}^{I} \varphi^i 
\]

Where for \( i = 1, \ldots, I \),

\[
C^i_{Hn} = \frac{P^i_{Hn} q^i_{Hn}}{v^i} 
\]

\[
\varrho = \frac{v}{u} 
\]

\[
v^i = \sum_{q^i_{Hn} > 0} P^i_{Hn} q^i_{Hn} \quad \lambda^i - \sum_{q^i_{Hn} > 0} P^i_{Hn} q^i_{Hn} 
\]

\[
v = \sum_{i=1}^{I} v^i 
\]

\[
\sum_{n=0}^{N} C^i_{Hn} = \frac{\lambda^i}{v^i} 
\]

\( \varphi^i \) - Changes in Individual excess burden

\( \varphi \) - Changes in Aggregated excess burden
4. THE FINAL FORMAT OF OUTPUT

The final output data would be presented as a set of total accounts describing:

- Net expenditures on goods in net prices on the column with receipt measured negatively on each classes of goods.
- Cost shares of firms presented would be calculated using the following formula:

\[ C_j^F_n = \frac{-P_j^F_n q_j^F_n}{P_{sj} q_{sj}} \quad n = 1, \ldots, N. \quad \ldots (33) \]

- Income shares of household presented were calculated using the following formula:

\[ C_i^H_n = \frac{P_i^H_n q_i^H_n}{V_i^1} \quad n = 1, \ldots, N. \quad \ldots (34) \]

- Net expenditure on transaction taxes
- Net expenditures on goods in market (gross) prices and the shares in aggregate quantities could then be calculated based on the net expenditures on transaction taxes using the following formula:
* Shares of firm sector in aggregate net firm supply:

\[ a_{fn}^j = \frac{q_{fn}^j}{q_{fn}} \quad \ldots (35) \]

- \( q_{fn}^j \) - Quantity of net supply of firm \( j \)
- \( q_{fn} \) - Aggregate Net firm supply

* Shares of household sector in aggregate net household demand:

\[ a_{hn}^i = \frac{q_{hn}^i}{q_{hn}} \quad \ldots (36) \]

- \( q_{hn}^i \) - household \( i \) net demand
- \( q_{hn} \) - Aggregate net household demand

- Net tax rates (relative to expenditure in gross prices)
- Price elasticities are calculated using the formula:

\[ \xi_{nm} = C_m \sigma_{nm} \]

- \( \xi_{nm} \) - Price elasticity for good \( n \) with respect to price \( m \).
- \( C_m \) - Cost share of good \( m \)
- \( \sigma_{nm} \) - Elasticity of substitution of good \( n \) with respect to \( m \)

* Elasticities of transfers with respect to tax revenue from transaction taxes (\( \gamma_R^i \)) is calculated using the following formula:

\[ \gamma_R^i = \frac{\delta\lambda}{\delta p} \frac{v^i}{v} \quad \ldots (37) \]
\( v^i \) - Net income
\( v \) - Aggregate net income
\( \rho \) - Total tax revenue
\( \lambda \) - Total transfer

*Elasticities of transfer with respect to the vector of tax instrument \((\gamma^i_T)\) is calculated using the following formula:

\[
\gamma^i_T = \frac{\delta \lambda}{\delta t} \frac{v^i}{v} \quad \text{(38)}
\]

\( \lambda \) - Aggregate Transfer
\( t \) - Total tax revenue
\( v \) - Aggregate income
\( v^i \) - Net income

- A Table showing the aggregate burden of tax change will be presented showing the percentage changes relative to the total national income.

- Aggregate tax burden can also be calculated as follows:

\[
\zeta = \left( \sum \theta^i_H q^i_H + \sum \theta^j_F q^j_F \right) \quad \text{(39)}
\]

\( \theta^i_H \) - Vectors of shares of taxes in aggregate income paid by household
\( \theta^j_F \) - Vectors of shares of taxes in aggregate income paid by firms
\( q^i \) - Vector of relative changes in net demand or supply of household
\( q^j_F \) - Vector of relative changes in the net demand or supply of firm
APPENDIX E (I)

FORMAT OF THE ECONOMICS PARAMETERS INPUTS FILE USED IN THE MODEL

HeaderOfPage " 1988 MALAYSIAN TAX REFORM EVALUATION -G.S.L. "
MODE absolute marginal
PARAMETERS
  GOODS 18
HOUSEHOLDS 8
FIRMS 10
TREELEVELHOUSE 3
TREELEVELSFIRM 6
FOREIGNSECTOR 18
BANK 0
MAXDIFF 1.0E-3
SUBSTELASBANK -300
CAPITALSERVICE 0
EndOfParameterList
LabelsOfGoods
  1 Food
  2 BevTobacco
  3 ClotFwear
  4 MfgDura
  5 HshldServ
  6 InvsGood
  7 Othgoods
  8 Petroleum
  10 Prcommodt
  11 Infwork
  12 Unskld
  13 Semiskld
  14 Skldlab
  15 Topmgmt
  16 Ownerent
  17 Capservs

375
18 Imports

DataOfHouseholds
IncomeShares  0 0 0 0 0 0 0

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282.27 16.403 45.621 2813 631.6343 5128.008 1451.482
221.926 719.158 5.414 0 3410 2336 848 32 0
6315 2300
ExpendituresOnTaxes
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375.1 256.96 93.28 3.52 0 0 0
MarginalShares
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2.3785060E-2 1.9310220E-1 5.4657560E-2 8.3569300E-3
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8.7965310E-2 3.1932610E-2 1.2050000E-3 0.0000000E0
2.3780000E-1 8.6609680E-2
SubstitutionElasticities
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KnotPlaces
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1 1 1 1 1 1 1 1 1
1 1

LabelOfHousehold 2 InfLab
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1545.686 246.1889 2239.891 448.3728 -11784.6 0 0
0 0 0 -3575 0
ExpendituresOnTaxes
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0 0 0 0 0 0 0 407.245 0

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-1650.07 0 -5802.59 0
ExpendituresOnTaxes
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KnotPlaces
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1-2-3 1-2-3 1-2-3 0 0 0 0 1-2 0 0 0

LabelOfHousehold 7 ENTREPRNR
ExpendituresOnGoods
683.5227 144.2741 27.02279 589.2272 186.9389 858.3415
475.394 75.71828 1013.949 126.981 0 0 0 0 0
-3005.600 -4923 0
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0 0 0 0 0 0 0 0 0 0 0 T
MarginalShares
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1.8308660E-1 0.0000000E0 0.0000000E0 0.0000000E0
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0.0000000E0 0.0000000E0
SubstitutionElastici ties
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379
KnotPlaces
1-2-3 1-2-3 1-2-3 1-2-3 1-2-3 1 1-2-3 1-2-3
1-2-3 1-2-3 0 0 0 0 0 1-2 0 0

LabelOfHousehold 8 FOREIGN
ExpendituresOnGoods
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| 210.1  |  25627.55 |    0 |    0 |    0 |    0 |  0 | -11946 | -44958 |
ExpendituresOnTaxes
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| 0.0000000E0 | 0.0000000E0 | 0.0000000E0 | 0.0000000E0 |
| 2.3903000E-3 | 8.9060210E-1 |
SubstitutionElasticities
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DataOfFirms
ProductShares 0 0 0 0 0 0 0 0 0 0
LabelOfFirm 1 Food
ExpendituresOnGoods
-19173.8 5.125 31.823 130.697 605.918 20.779 1350.823
| 362.634 | 693.986 | 4164.427 | 914.73 | 1253.876 | 562.742 |
| 435.626 | 340.511 | 508.77 | 3965.556 | 3825.86 |
ExpendituresOnTaxes
| 147.094 |   0 |   0 |   0 |   0 |   0 |   0 |   0 |   0 |
| 137.926 | 61.902 | 47.919 | 37.456 | 55.965 | 0 | 128.735 |
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KnotPlaces
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| 1-2-3 | 1-2-3 | 1-2-3-4-6 | 1-2-3-4-6 | 1-2-3-4-6 | 1-2-3-4-6 |
| 1-2-3-4-6 | 1-2-3-4-6 | 1-2-3-4-5 | 1-2 |
### LabelOfFirm 2 BevTobacco

#### ExpendituresOnGoods

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| 121.42 | -2037.74 | 3.36 | 13.8 | 65.47 | 2.13 | 205.336 | 12.804 | 173.85 | 86.17 | 95.122 | 130.389 | 58.519 | 45.3 | 35.409 |
| 52.907 | .727.56 | 208.2 |

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### LabelOfFirm 3 ClotFwear

#### ExpendituresOnGoods

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### Substitution Elasticities

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Knot Places
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1-2-3-5 1-2-3-5 1-2-3-4 1-2

Label Of Firm 10 Procommtd
Expenditures On Goods
12.158 3.71 7.237 365.772 984.261 112.071 2648.246
1532.789 4670.595 -35307.9 5885.17 1585.634 711.636
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Knot Places
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Marginal Tax shares
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-0.107729 -0.1145088 0
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0.4832076 0.1292283 0.0195135 0.0558589 0.0004784
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Tax Weights
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APPENDIX E (II)
INPUT FILE FOR THE TAX PARAMETERS

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  RefHousehold 1

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  2 SalBTT
  3 SalCFT
  4 SalDurrT
  5 SerHST
  6 SalOGT
  7 CommT
  8 ExciseT
  9 ExpCoT
 10 ImportT
 11 IncUnsLT
 12 IncSeLT
 13 IncSkLT
 14 IncHMLT
 15 IncEntT
 16 CapIncT
 17 PayrT

MarginalRevenueShares
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MarginalTaxshares
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<td>1.0</td>
</tr>
<tr>
<td>10</td>
<td>17</td>
<td>14</td>
<td>1.0</td>
</tr>
<tr>
<td>10</td>
<td>17</td>
<td>15</td>
<td>1.0</td>
</tr>
<tr>
<td>10</td>
<td>17</td>
<td>16</td>
<td>1.0</td>
</tr>
</tbody>
</table>

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16-18

end
APPENDIX F

SENSITIVITY ANALYSIS TO OBSERVE VARIATION IN RESULT FROM CHANGING THE ELASTICITY OF SUBSTITUTION OF HOUSEHOLDS

The analysis and recommendations made in the earlier section rely heavily on the accuracy of the model in producing some sensible projection of the possible impact of changes in each of the tax instruments. The reliability of the result would in turn depend on the parameters especially those which describe the marginal behavior of the agent prescribed in the model. This is especially crucial in the model that is linear in nature such as this one.

Most of the parameters used in the model, especially those related to elasticities, were obtained from the most reliable sources. Some of these had however been taken from other comparable studies. Crucial among these are the figures for 'elasticities of substitution' for the households sector. This is a very important parameter as it will affect the marginal behavior of these household which will be responsible in determining the impact of tax instruments changes.

Other sensitivity analysis particularly on the Corporate tax analysis, with respect to income elasticity of the public sector, foreign sector and the private households sectors in relation to the supply of capital services had also been carried out and the results described in Chapter seven earlier.
In order to further satisfy our conscience, we performed some sensitivity analysis by varying the elasticity of substitution of the households groups in the hope of strengthening the result of the General Equilibrium model. This will be done by attempting to prove the sensibility of the results compared to others that were obtained by using a different set of parameters. This would at the same time check the sensitivity of the parameters on the findings.

Household consumption was classified into three levels under the nested constant elasticity of substitution function. The elasticity used was as shown in Table F.1.

<table>
<thead>
<tr>
<th>TABLE F.1.</th>
</tr>
</thead>
<tbody>
<tr>
<td>VARIATION ATTEMPTED IN THE SENSITIVITIES ANALYSIS</td>
</tr>
<tr>
<td>Level 1</td>
</tr>
<tr>
<td>Base case</td>
</tr>
<tr>
<td>Variation 1</td>
</tr>
<tr>
<td>Variation 2</td>
</tr>
<tr>
<td>Variation 3</td>
</tr>
</tbody>
</table>

Source: Assumptions used in the model and its variation.

There were three levels of utility structure used for the households sector. The first level showed the relationships between investment goods (saving) and other goods (households consumption). The second level showed the relationships between aggregate consumption and leisure, while the third level showed the
relationship between consumption of various consumables goods and services.

The first variation gauges the sensitivity of the elasticity of substitution in the third level i.e. between all consumable goods and services in the economy. The base case assumed moderate substitution in the consumer demand system. The variation taken was to make the elasticity of substitution unitary \(^1\) which implied a fixed budget shares. This means that all households were assumed to have a fixed consumption pattern.

The second variation attempt to gauge the sensitivity of elasticity of substitution at level two, i.e. between aggregate consumption and leisure. The base case assumed a near complementary relationship between aggregate consumption and leisure. The variation made the elasticity of substitution higher implying that aggregate consumption is relatively more competitive (less complementary) in relation to leisure.

The third variation attempt to gauge the sensitivity of elasticity of substitution at the first level i.e. between investment goods (saving) and consumption goods \(^2\). The base case assumes a unitary elasticity between them, reflecting a fixed marginal propensity to save. The variation taken was to make the elasticity of substitution lower (0.5), implying that investment goods or saving is relatively more complementary to consumption.

\(^1\) Instead of 0.5 as used in the base case.

\(^2\) which comprised of all goods and services in the economy.
To observe the effect of varying these elasticity of substitutions, we prepared a set of comparative figures showing the effect of tax instruments changes on the prices of goods and services, wages rate, profitability ratio, import, demand and supply changes, output changes and changes in the real income.

1. COMPARATIVE EFFECT ON THE MARKET PRICES CHANGES

Figures presented in Table F.2 showed the direct effect on prices of goods and services as a result of the 1% increase in the tax rate for each of the tax instruments facing them.

In the case of prices of goods and services, all the four sets of results showed that prices roughly remained unchanged particularly in structure. It means that variation in the elasticities of substitution between consumption of goods and services, investment (saving) and leisure do not affect market prices and firms behavior substantially.

In the case of wage rates changes however, the second variation resulted in some relatively outstanding differences in the result. The higher substitution elasticity set between aggregate consumption and leisure caused wage rates to be more sensitive. Wage rates declined relatively less drastically in this case as a result of the income taxes rates increased. This was due to the milder reaction in the supply of labours services as a result of the tax rate changes. Bear in mind however that this wage rate is after tax figures.
### TABLE F.2.

**PRICE IMPACT BASED ON ABSOLUTE CHANGE IN THE INSTRUMENT**

( IN PERCENTAGE )

<table>
<thead>
<tr>
<th>Direct impact on tax instrument change</th>
<th>BASE CASE</th>
<th>VARIATION 1</th>
<th>VARIATION 2</th>
<th>VARIATION 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>FOOD</td>
<td>0.9647</td>
<td>0.9647</td>
<td>0.9648</td>
<td>0.9647</td>
</tr>
<tr>
<td>BEV.&amp; TOBB.</td>
<td>0.9996</td>
<td>0.9992</td>
<td>0.9994</td>
<td>0.9995</td>
</tr>
<tr>
<td>CLOTH.&amp; FWR.</td>
<td>0.9911</td>
<td>0.9910</td>
<td>0.9911</td>
<td>0.9911</td>
</tr>
<tr>
<td>MFG.DURABLES</td>
<td>0.7211</td>
<td>0.7187</td>
<td>0.7215</td>
<td>0.7211</td>
</tr>
<tr>
<td>HSLD.SERVICES</td>
<td>0.8901</td>
<td>0.8881</td>
<td>0.8893</td>
<td>0.8901</td>
</tr>
<tr>
<td>OTHER GOODS</td>
<td>0.5098</td>
<td>0.5091</td>
<td>0.5101</td>
<td>0.5096</td>
</tr>
<tr>
<td>PETROLEUM</td>
<td>0.8955</td>
<td>0.8952</td>
<td>0.8959</td>
<td>0.8955</td>
</tr>
<tr>
<td>PRIM COMMDT.</td>
<td>0.4932</td>
<td>0.4919</td>
<td>0.4996</td>
<td>0.4917</td>
</tr>
<tr>
<td>UNSKLD.LABORS</td>
<td>-0.1519</td>
<td>-0.1517</td>
<td>-0.1225</td>
<td>-0.1585</td>
</tr>
<tr>
<td>SEMISKLD.LABORS</td>
<td>-0.0496</td>
<td>-0.0496</td>
<td>-0.0181</td>
<td>-0.0554</td>
</tr>
<tr>
<td>SKILLED LABORS</td>
<td>-0.0074</td>
<td>-0.0074</td>
<td>0.0198</td>
<td>-0.0080</td>
</tr>
<tr>
<td>TOP MANAGEMENT</td>
<td>-0.0468</td>
<td>-0.0468</td>
<td>-0.0191</td>
<td>-0.0479</td>
</tr>
<tr>
<td>ENTREPRENEURS</td>
<td>-0.1188</td>
<td>-0.1188</td>
<td>-0.1030</td>
<td>-0.1212</td>
</tr>
<tr>
<td>CAPITAL SERVICES</td>
<td>0.0389</td>
<td>0.0373</td>
<td>0.0374</td>
<td>0.0392</td>
</tr>
<tr>
<td>IMPORTS</td>
<td>-0.4460</td>
<td>-0.4481</td>
<td>-0.4437</td>
<td>-0.4466</td>
</tr>
</tbody>
</table>

Source: Compiled from the result of the G.E. analysis.

The differences in the reaction rate were quite significant in the case of semiskilled, skilled and top management but very mild in the case of entrepreneurs groups. This phenomenon could be explained by the relatively fixed behavior of these three groups of workers in their labours supply. These groups tend to supply labours services at their maximum level, unlike...
the entrepreneurs who were more elastic in their supply behaviour. The differences in responses here implied that as we allow consumers to react more sensitively toward price changes (as a result of tax rate increased) independently of the labour services supply, the impact on wage rates becomes milder basically because households reaction in the supply of labour services were more independent of their consumption. This means that the result presented in the analysis earlier had been very conservative in reflecting the reaction of the households group. Had the elasticity of substitution between consumption and leisure been fixed higher, as expected for some of the households classes, the impact would have milder.

In the case of capital services and imports prices however, no significant difference occurred between the variation. This implied that variation in elasticities of substitution between consumption goods, leisure and investment (saving) does not greatly affect the price of capital services and import.

2. COMPARATIVE IMPACT ON REAL INCOME CHANGES

To complete the observation about the sensitivity of the elasticity of substitution, we present a set of figures on the impact of tax instrument changes on the welfare of the households sector in Table F.3. We selected Lump-sum tax as the standard of yardstick for the tax instruments just as we used the tax instrument as the basis of comparison in the analysis of each individual tax instrument earlier.

Again, the second variation resulted in a different reaction from the tax rate increase. It showed that as we set consumption to be less complementary to leisure, the
impact of the tax rate increase on real income became relatively worse. Overall, households group suffered a greater welfare loss as their consumption was more complementary to labor supplies. This fact indirectly implied that our earlier result understated the impact of tax changes. The effect on real income and welfare of the households group in our analysis should therefore be taken more seriously.

### TABLE F.3.

REAL INCOME IMPACT BASED ON ABSOLUTE CHANGES IN LUMP SUM TAX (IN PERCENTAGE)

<table>
<thead>
<tr>
<th>Direct impact on tax instrument change</th>
<th>BASE CASE</th>
<th>VARIATION 1</th>
<th>VARIATION 2</th>
<th>VARIATION 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>PUBLIC SECTOR</td>
<td>5.2725</td>
<td>5.2742</td>
<td>5.2817</td>
<td>5.2706</td>
</tr>
<tr>
<td>INFORMAL LABORS</td>
<td>-3.5210</td>
<td>-3.5109</td>
<td>-3.4728</td>
<td>-3.5318</td>
</tr>
<tr>
<td>UNSKILLED LABORS</td>
<td>-1.0321</td>
<td>-1.0289</td>
<td>-1.0643</td>
<td>-1.0239</td>
</tr>
<tr>
<td>SEMISKLD.LABORS</td>
<td>-0.8280</td>
<td>-0.8292</td>
<td>-0.8698</td>
<td>-0.8203</td>
</tr>
<tr>
<td>SKILLED LABORS</td>
<td>-1.8983</td>
<td>-1.9027</td>
<td>-1.9054</td>
<td>-1.8973</td>
</tr>
<tr>
<td>TOP MANAGEMENT</td>
<td>-2.3263</td>
<td>-2.3306</td>
<td>-2.3245</td>
<td>-2.3255</td>
</tr>
<tr>
<td>ENTREPRENEURS</td>
<td>-4.7889</td>
<td>-4.7949</td>
<td>-4.7851</td>
<td>-4.7891</td>
</tr>
<tr>
<td>FOREIGN SECTOR</td>
<td>0.0221</td>
<td>0.0212</td>
<td>0.0217</td>
<td>0.0221</td>
</tr>
</tbody>
</table>

**Source:** Compiled from the results of the G.E. analysis.

3. CONCLUSION ON THE SENSITIVITY ANALYSIS

The sensitivity analysis above highlighted the crucial points in relation to the general equilibrium result presented earlier.
Firstly, the model was not sensitive to marginal propensity to save. The simulation made to show a lower propensity to save only marginally lowered the price responsiveness. Capital services in price or demand did not change significantly as a result of these shifts.

Secondly, the model is sensitive to consumer choice between consumption and leisure. The higher the substitution between consumption and leisure, the milder the effect on wage rate and labours services supply.

Thirdly, the model is sensitive to consumer choices between goods and services in the economy. When we allow consumption patterns to be altered in reaction to the tax rate change, the effect on the demand and output of the firms product is more severe. This implied that impacts reported and used as the basis of discussion about the tax reform impacts earlier had been relatively understated.

Finally, the impact on the households welfare is mild on consumer choice between consumption and leisure. The higher the substitution between consumption and leisure, the more severe the welfare impact that could be expected to be. This again reflects the understatement of the welfare impact described in the analysis of the result which implies that the welfare effect should be taken more seriously.

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3 Instead of the fixed budget assumption as had been made in the base case.

4 Bear in mind, that the difference in result here is not as substantial as in the other two cases above.


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