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Who Pays for Protection in Malaysia?: A New General Equilibrium Approach*

Meher Manzur
Curtin University of Technology

Alamelu Subramaniam
National University of Singapore

Abstract

This paper uses a simple general equilibrium model to isolate the transfer effects resulting from protection in Malaysia. Ignoring the deadweight losses associated with protection, the model uses the concept of true protection to construct a transfer matrix which shows how income is transferred among various sectors of the economy. The evidence suggests that it is only the exporters who pay for protection. The cost to Malaysian exporters was about 2.56 percent of GDP in 1989.

I. Introduction

The issue of true cost of protection in a small open economy has historically been intriguing. The apparent benefits of promoting infant industries

* Correspondence Address: Meher Manzur, School of Economics and Finance, Curtin University of Technology, GPO Box U1987, Perth 6001, Western Australia; and Alamelu Subramaniam, Department of Economics and Statistics, National University of Singapore, Singapore. The authors are grateful to Ken Clements, an anonymous referee and Hamid Beladi, Co-Editor of this journal for useful comments and Jahar Choudhury for excellent research assistance.

and meeting balance of payments targets through limiting imports continue to make protection politically attractive. It is ironical that the time has passed for these benefits. With hindsight, their time may have passed before it was born. For example, if employment is to be boosted in the import-competing sector, it can be better achieved through other measures, such as, by cutting wages or by subsidizing employment. To a first approximation, protection involves transfers of income which are a zero-sum game, and when we include the effect of the deadweight losses also, the net effect is negative. As a result, if one sector is given protection, this necessarily implies the unintended outcome of hurting the unprotected sectors.

A series of papers by Sjaastad [1980], Sjaastad and Clements [1981] and Clements and Sjaastad [1984] discuss the effects of protection in a simple general equilibrium framework. The traditional Heckscher-Ohlin approach is to investigate the incidence of protection in terms of factors as Stolper and Samuelson [1941] demonstrate for the long run and Mussa [1974] for the short run. The Sjaastad-Clements approach is a sectoral approach which divides the economy into three sectors: home goods (or non traded goods), importables and exportables. One major attraction of the model is that it emphasizes the shifting of the burden of protection from one sector to another. More specifically, the approach makes it possible to measure the transfer of income among various economic agents arising from protection for a given real income. In reality, of course, protection will result in inefficient allocation of resources and hence a lowering of income.

We apply the Sjaastad-Clements approach to measure the incentive effects of protection in Malaysia. A particular advantage of the Sjaastad-Clements model is that it enables us to obtain a simple and quick measure of the transfers resulting from protection without the rigorous information requirements of a computable general equilibrium model (widely used elsewhere for the same purpose).

In its pre-independence days, the Malaysian economy was virtually unprotected and tariffs served mainly as a revenue-raising instrument. In the late 1950s, however, the Malaysian government embarked on a major industrialization effort based on recommendations in a World Bank study, whereby import substitution under protection backed by investment incentives was to be a strategy for industrialization and economic development ⟨Ariff

[1991]). Protection was therefore, deemed to be necessary for encouraging the growth of the manufacturing sector.

To aid its purpose, the Malaysian government established various tariff-marking bodies over the years such as Tariff Advisory Board (TAB) in 1963, the Action Committee on Tariff and Industrial Development (ACTID) in 1966 and the Capital Investment Committee (CIC) in 1969. Between 1962 and 1970, 396 new tariffs were introduced and the rates on 274 of the existing 811 tariffs were increased. Tariff rates were lower for only 92 items and sub-items in the same period (Lee [1985]). With this aggressive outlook of TAB, Malaysia became a medium to highly protected less developing country (LDC) by the end of the 1960s.

Following TAB and ACTID which were abolished in 1970 and CIC which was abolished in 1971, The Federal Industrial Development Authority (FIDA) was established together with the Tariff Advisory Committee (TAC) and the Special Advisory Committee on Tariffs (SACT). Although these Committees adopted aggressive approaches in the beginning, by the later part of the 1970s, they had mellowed and began granting protection only to 'deserving' industries. In fact, in its Third Malaysia Plan [1976-1980], the government announced its intention to reduce the level of effective protection afforded to manufacturing industries and to narrow the differences in effective protection between industries in order to promote a more efficient pattern of industrialization in the country.

In Malaysia, the average effective rates of protection (EPR), which measure protection given to the production processes, have been quite high even though nominal rates of protection (NPR), which refer to protection given to final products, have been low. The nominal and effective rates, which averaged 13% and 25% respectively in 1965 rose to 18% and 44% respectively in 1970. The average EPR increased further to 55% in 1973. According to Ariff [1991], the NPR exhibited a general upward trend in the 1970s, the average NPR for all sectors increasing from 16% in 1970 to 18% in 1978 (Ariff [1991]). This study also asserts that there has been no significant overhaul of tariff rates in the 1980s except for minor ad hoc adjustments through annual budgets. Hence, the protection structure, which was designed under the import-substitution phase, has been virtually unchanged for more than a decade now. This is incompatible with Malaysia's

current strategy of export-oriented industrialization.

The higher costs faced by exporters in the manufacturing sector as a result of protection has been offset to some extent by export incentives. As gathered from various government publications, the Malaysian government, which has adopted an active export promotions drive, aims to position the manufacturing sector as the main engine for growth in exports. Hence, it has devised a variety of export incentives and assistance schemes in order to encourage export expansion. Although this has a compensatory effect, the net results are distortions and misallocations of resources arising out of the existing tariff structure. Consequently, the need for a systematic analysis of the effects of protection in Malaysia can hardly be exaggerated.

The paper is organized as follows. Section II gives a brief overview of the Sjaastad-Clements model. The data used in this study are given in Section III, followed by the measurement of the transfers implicit in Malaysian protection in the next section. The last section sums up the paper.

II. Model

This section is based on Sjaastad and Clements [1981] and Clements and Sjaastad [1984]. For a detailed exposition of the model, the reader is referred to Section IV of Sjaastad and Clements [1981] and Appendix One of Clements and Sjaastad [1984].

The Sjaastad-Clements model introduces a sector approach which focuses on the key role of home goods in devising a simple measure of incidence of protection. With a home goods sector, one can determine whether the tariff incidence is borne primarily by exporters (in which case it operates like an export tax) or shared between producers of home goods and exporters. The response of the price of home goods to that of importables is derived as follows. Let q^s and q^d be the quantity supplied and demanded of home goods and p_i be the nominal price of good i ($i = x$ for exportables, m for importables and h for home goods). Assuming real income and the economy's factor endowment to be fixed and using a ^ to denote proportional change ($\hat{x} = dx/x$), the change in the supply and demand of home goods is

$$\hat{q}^s = \eta_x^s \hat{p}_x + \eta_m^s \hat{p}_m + \eta_h^s \hat{p}_h \tag{1}$$

$$\hat{q}^d = \eta_x^d \hat{p}_x + \eta_m^d \hat{p}_m + \eta_h^d \hat{p}_h \tag{2}$$

where η_i^s and η_i^d's are compensated supply and demand price elasticities for home goods. These are subject to homogeneity constraint

$$\sum_i \eta_i^s = \sum_i \eta_i^d = 0. \tag{3}$$

Equilibrium in the home goods market requires $\hat{q}^s = \hat{q}^d$, so that from equations (1)-(3) we obtain $\hat{p}_h = \omega\hat{p}_m + (1-\omega)\hat{p}_x$ or

$$\hat{p}_h - \hat{p}_x = \omega(\hat{p}_m - \hat{p}_x) \tag{4}$$

where

$$\omega = \frac{\eta_m^d - \eta_m^s}{\eta_h^s - \eta_h^d} \tag{5}$$

is the elasticity of p_h/p_x with respect to p_m/p_x. Since $\eta_h^s > 0$ and $\eta_h^d < 0$, it follows that the sign of ω depends on that of the numerator in equation (5) . In absence of complementarity (which is reasonable at a high level of aggregation) $\eta_m^d \geq 0$ and $\eta_m^s \leq 0$, so that $\omega \geq 0$, implying that the price of home goods never falls with the tariff. Thus, ω represents the proportion of the tariff that is an implicit tax on the export sector. In other words, ω gives the general equilibrium relationship between these prices, p_h, p_m and p_x, and is referred to as the incidence parameter. In what follows, the full effect of a tariff is demonstrated more clearly in terms of 'true' tariffs and 'true' subsidies.

Let

$$d = s + \omega(t - s) \tag{4}$$

where d = proportional increase in the price of home goods (or equivalently, nominal wages), s = weighted average subsidy equivalent of the export subsidies and other forms of protection to exporters, t = weighted average tariff equivalent of the actual ad valorem tariffs and other forms of protection to firms in the import-competing sector, and ω is the incidence parameter lying between zero and unity.

Equation (4) states that prices of home goods will rise by the full amount of the export subsidy and some part of the excess of the tariffs over subsidy. Note that represents the fraction of net protection, $(t - s)$, falling on exporters since tells us how much wages increase relative to the price of

exportables, *i.e.*, $\omega = (d - s)/(t - s)$.

In order to make the influence of the induced change in the price of home goods more explicit, the concepts of true tariffs and subsidies are used. True tariffs and subsidies are defined as

$$t^* = \Delta P_m / \Delta P_h = (t - d)/(1 + d)$$
$$s^* = \Delta P_x / P_h = (s - d)/(1 + d)$$

Note that true protection will always be less than nominal protection unless $d = 0$.

As stated earlier, a major thrust of the Clements-Sjaastad model is to provide a simple and quick measure of the transfers across various sectors of the economy arising from protection for a given real income. This is accomplished through constructing a transfer matrix using the concept of true protection as follows.

Let q_x = value of production of exportables; q_m = value of production of importables; m = value of imports; x = value of exports; $C_m = m + q_m$ = value of consumption of importables; and $C_x = q_x - x$ = value of consumption of exportables. All variables are defined in units of GDP at world prices. Economic agents are classified into five overlapping groups: exporters, import-competing firms, consumers, taxpayers and the government. As the effect of nominal protection t and s can be exactly replicated by imposing t^* and s^* (with the price of home goods remaining constant), we look at the implicit transfers resulting from protection in terms of t^* and s^*.

From the relationship between the true tariff and true subsidy given $\omega t^* + (1 - \omega)s^* = 0$, the true export subsidy s^* or the true export tax $-s^*$ can be represented as $-s^* = \omega t^*/(1 - \omega)$. If we impose an export tax of $-s^*$ on the export sector, exporters lose income in proportion to the quantity that they produce. Hence, their total loss is $-s^* q_x = -s^*(C_x + x) = \omega t^* q_x/(1 - \omega)$. This exporters' loss is transferred to consumers in the form of paying less for exportables and to the government in the form of tax revenue. Consumers will get a net transfer from the exporters equal to $-s^* C_x = \omega t^* C_x/(1-\omega)$. The government's revenue from the export tax is $-x s^* = \omega t^* x/(1 - \omega)$.

If the import-competing sector receives true protection at the rate t^*, they will gain income in proportion to the value of production of importables $t^* q_m$. The gain of the import-competing sector comes entirely at the expense of

consumers. It takes the form of consumers paying higher prices for importables. The government also gains from the tariff in the form of tariff revenue mt^*. Hence, the consumers' total transfers to the import-competing sector and the government is $t^*q_m + t^*m = t^*C_m$.

The government collects a total amount of $\omega t^*x/(1-\omega) + t^*m$ from the protection policy, t^*m coming from consumers and $\omega t^*x/(1-\omega)$ from exporters. However, assuming that this additional government revenue is used to reduce other forms of existing taxation, this will be transferred back to taxpayers so that they gain $t^*[m + \omega x/(1-\omega)]$. Therefore, the government will not have a net gain from protection.

The transfers between the economic agents are summarized in the form of matrix in Table 1. The final column represents the total transfers from each sector and the final row shows the total transfers to each sector. The column for taxpayers serves to record the transfer from the government of the higher revenue from commercial policy back to taxpayers.

Consumers gain from lower internal prices of exportables as a result of the export tax $-s^*$. Their gain is equal to $\omega t^*C_x/(1-\omega)$. Consumers lose as a result of protection by having to pay higher prices for importables is t^*C_m.

Combining the consumers gain and loss of real income, their net position as a result of protection is $T_c = t^*[\omega C_x - (1-\omega)C_m]/(1-\omega)$. If T_c is positive, on balance consumers gain from protection. As t^* and $(1-\omega)$ are both positive, $T_c > 0$ when $[\omega C_x - (1-\omega)C_m] > 0$. This condition may be expressed as

$$\omega > C_m/(C_m + C_x). \tag{7}$$

Table 1
Inter-Sectoral Transfers Arising from Protection
(as fraction of GDP)

From \ To	Import-competing firms	Consumers	Taxpayers	Government	Total
Exporters	0	$\omega t^*C_x/(1-\omega)$	0	$\omega t^*x/(1-\omega)$	$\omega t^*q_x/(1-\omega)$
Consumers	t^*q_m	–	0	t^*m	t^*C_m
Government	0	0	$t^*[m+\omega x/(1-\omega)]$	–	$t^*[m+\omega x/(1-\omega)]$
Total	t^*q_m	$\omega t^*C_x/(1-\omega)$	$t^*[m+\omega x/(1-\omega)]$	$t^*[m+\omega x/(1-\omega)]$	

In words, if the shift coefficient exceeds the share of importables in total consumption of tradeables, then consumers gain from protection.

Under the assumption that the additional government revenue gets transferred back to consumers in the form of reductions in existing taxes (or that the government supplies useful services to consumer), we can consolidate these two sectors into the category consumers cum taxpayers. The government revenue for protection, T_t is $t^*[\omega x + (1 - \omega)m]/(1 - \omega)$. Hence consumers cum taxpayers total net gain is $T_t + T_c = t^*[\omega q_x - (1 - \omega)q_m]/(1 - \omega)$.

Consumers cum tax-payers experience a net gain if $T_c + T_t > 0$. As $t^*(1 - \omega)$ are both positive, $T_c + T_t > 0$ if $[\omega q_x - (1 - \omega)q_m] > 0$, *i.e.*, if

$$\omega > q_m/(q_m + q_x). \tag{8}$$

In words, if the shift coefficient exceeds the share of importables in the total production of tradeables, then consumers cum tax-payers are net gainers from protection.

III. The Data

In this section, we discuss the data used to compute the true tariff and true export tax in the next section. The data include Gross Domestic Product (GDP) by industrial origin, total GDP, volume of exports and volume of imports for the year 1989, obtained from the *Economic Report* : 1991-92 published by the Ministry of Finance of Malaysia. GDP by industrial origin and total GDP are given in Table 2. The remaining data are as follows:

Volume of exports ($million) [1989] : 67,824.5

Volume of imports ($million) [1989] : 60,858.1.

All goods are classified into exportables, importables and home goods, Agriculture, livestock, forestry, fishing, mining, quarrying and manufacturing will be classified as traded goods. All the others will be treated as non-traded goods, that is, home goods. This classification is based on Goldstein and Officer [1979]. Within traded goods, agriculture, livestock, forestry, fishing, mining and quarrying will be classified as exportables. In the absence of the data classifying the manufacturing industry into exportables, importables and home goods, we use an approximation that about 70 per-

cent of manufacturing are importables and the remainder as exportables.

Based on the above information, the following are calculated; share of exportables production in GDP (q_x), share of importables production in GDP (q_m), share of home goods in GDP (q_h), share of exports in GDP (x), share of imports in GDP (m), share of exportables consumption in GDP ($c_x = q_x - x$) and share of importables consumption in GDP ($c_m = q_m + m$). These computed values are given in Table 3.

The data on tariffs and subsidies are more troublesome and very difficult to collect. We have the average levels of import duties in Malaysia given in Table 4, reproduced from *Tariff Profiles in ASEAN : An Update* [1985]. As can be seen from this table, the level of import duties in Malaysia in 1985

Table 2

Gross Domestic Product by Industrial Origin[1]

Industry	1989
Agriculture, Forestry and Fishing[2]	14,767
Mining and Quarrying	7,385
Manufacturing	18,089
Construction	2,380
Electricity, gas and water	1,344
Transport, storage and communications	4,859
Wholesale and retail trade, hotels and restaurants	7,748
Finance, insurance, real estate and business services[3]	6,770
Government services	8,132
Other services [4]	1,519
Less: Imputed bank service charge	3,356
Add: Import duties	7,442
GDP (Total)	72,079

Notes: 1. In 1978 constant prices, $ million, Malaysia;
2. Includes livestock and horticulture;
3. Includes own occupied dwellings;.
4. Community, social and personal services, private non-profit services to households and domestic services of households.

Source: *Economic Report* 1991-1992, Malaysia.

Table 3
Structure of the Malaysian Economy

Type of Industry	% of GDP
Exportables (q_x)	38
Importables (q_m)	17
Home goods (q_h)	45
Total production	100
Exports (x)	94
Imports (m)	84
Exportables consumption (c_x)	–56
Importables consumption (c_m)	101

was on average, about 25 percent. Unfortunately, we have not been able to collect a corresponding figure for 1989. Although Ariff's [1991] recent study asserts that the structure of protection in Malaysia has not undergone any major changes in the past decade, some official publications (such as *Input-Output Tables*, 1988 Department of Statistics, Malaysia) indicate a lowing of tariffs in recent years.We can also see from Table 2 that the share of import duties (collected) in the Malaysia GDP in 1989 was about 10 percent. Since there is always a difference between the tariff rate and tariff-take, we use an average of these two information, that is, an average of 25 percent (from Table 4) and 10 percent (from Table 2). Therefore, we take 18 percent as the nominal ad valorem tariff equivalent of all forms of import protection in Malaysia in 1989.

The precise average nominal rates of assistance for exports are not available. The Malaysian government has introduced a number of export incentives and assistance schemes in order to promote exports (*Export Incentives in Malaysia : Practical Guide for Malaysian Exporters,* 1987). For our purpose we assume that all subsidies given by the government are export subsidies. We collect figures for all subsidies from the Yearbook of Statistics, Malaysia, 1990. The total amount comes to about 1 percent of the Malaysian exports in 1989. We shall thus use 1 percent as the approximate rate of nominal assistance given to Malaysian exporters.

Table 4
Average Levels of Import Duties in Malaysia

Description	Import Duties
Primary	3.46
Unprocessed foodstuffs	3.20
Raw materials	3.50
Unprocessed fuels	3.75
Intermediate	17.04
Processed food and beverages for industry	72.89
Industrial supplies processed	14.26
Processed fuels and lubricants. n.e.s	7.33
Capital goods, including parts and Accessories	6.50
Capital goods(except transport equipment)	5.88
Parts and accessories of Capital goods (except transport equipment)	10.41
Consumer goods	63.85
Foods and beverages, primary, mainly for household consumption	11.22
Food and beverage, processed, mainly for household consumption	257.85
Motor spirit	7.57
Passenger motor cars	71.52
Durable goods	11.61
Semi-durable goods	18.67
Non-durable goods	21.80
Transport equipment (excluding passenger motor cars) including parts and accessories.	19.26
Transport equipment, industrial	0.83
Transport equipment, non-industrial	11.96
Parts and accessories of transport equipment	36.24
Others	10.64
Goods elsewhere not specified	10.64
Total	24.99

Source: *Tariff Profiles in ASEAN : An Update* [1985].

IV. The Transfer Matrix

As mentioned in the previous section, we take 18 percent as the nominal ad valorem tariff equivalent of all forms of import protection and 1 percent as the approximate rate of nominal assistance given to Malaysian exporters. We take the value for Malaysia to be 0.6. See Subramaniam [1992] for details of how this value is obtained.

With $t = 0.18$ and $s = 0.01$, the effect of protection on the price of home goods (wages) is $d = 0.112$ from equation (2.2). Using this estimate of d, we find that t^* is 0.061 and s^* is –0.092. Thus, as a result of protection, true tariffs in Malaysia is only 6.1 percent. True protection given to import-competing firms is much less than the nominal value of 18 percent. We also see that rather than being assisted, exporters are subjected to a tax of about 9.2 percent. Note that this concept of 'true' protection is the same as the 'net' protection described in Corden [1971].

We now present the Malaysian transfer matrix in Table 5. The net loss of income for exporters amounts to 2.56 percent of GDP. As GDP for 1989 was $72,079 million, this loss is equivalent to about $3,034.5 million in 1989. The income lost by exporters is transferred to consumers and the government. The gain of the import-competing sector of 0.77 percent of GDP comes entirely at the expense of consumers.

In section 2, we saw that consumers will gain from protection if

$$\omega > C_m / C_m + C_x \tag{9}$$

Table 5

Transfers of Income Among Income Recipients Malaysia 1989 (as a percentage of GDP)

From \ To	import-competing firms	Consumers	Taxpayers	Government	Total
Exporters	0	–3.78	0	6.34	2.56
Consumers	0.77	–	0	3.78	4.55
Government	0	0	10.12	–	10.12
Total	0.77	–3.78	10.12	10.12	

and consumers-cum-taxpayers will gain from protection if

$$\omega > q_m/q_m + q_x \tag{10}$$

The share of importables in total consumption is $C_m/(C_m + C_x) = 2.24$. As this is greater than $\omega (= 0.6)$, we conclude that Malaysian consumers on average do not gain from protection. The share of importables in total production of tradeables is $q_m/(q_m+q_x) = 0.31$ Since $\omega = 0.6 > 0.31$, consumers cum taxpayers gain from protection. In other words, exporters lose by more than import-competing gain. Given an ω value of 0.6, greater production of exportables ($q_x = 0.38$) than importables ($q_m = 0.17$) implies that consumers cum taxpayers experience a net gain from import protection. From Table 5, the gross gain to consumers cum taxpayers is (–3.78 + 10.12) = 6.34 percent of GDP in 1989. Due to higher internal prices of importables, consumers in addition lose 4.55 percent, causing the net gain to consumers cum taxpayers to be 6.34–4.55 = 1.79 percent of GDP.

In short, true protection is found to be substantially different from nominal protection, implying that the ultimate effects of protection are very different from that policymakers believe that to be. This result is consistent with Clements and Sjaastad [1984] and Choi and Cumming [1986].

V. Conclusion

This paper has systematically analyzed the economic effects of protection in Malaysia. We apply a simple general equilibrium framework based on Clements and Sjaastad [1984] to the Malaysian data. Estimates of the nominal ad valorem tariff rate and approximate rate of nominal assistance given to exporters were taken to be 18 percent and 1 percent respectively. An interesting finding is that true tariff in Malaysia was only 6.1 percent, much less than 18 percent. Also, instead of being assisted, exporters were subject to a tax of about 9.2 percent. The cost of protection to Malaysian exporters was 2.56 percent of GDP or $3,034.5 million in 1989.

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