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EVALUATION OF TRADE POLICIES IN PENINSULAR MALAYSIA, 1965–85

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I. INTRODUCTION

MALAYSIA'S postwar economic development has passed through three distinct phases, namely, export promotion of primary products in the 1950s, import substitution in the 1960s, and promotion of exports of manufactured goods in the 1970s. Although a number of incentive programmes were offered by the government during the three development phases, the effectiveness of these programmes in encouraging growth in the various industrial sectors has not been thoroughly investigated. The objective of this study is to make such an assessment.

Commercial policies include tariffs, subsidies, quotas, and prohibitions on imports (or exports), and exchange rate policies. Industrial promotion policies include various incentives such as export allowances, duty drawbacks on imports of raw materials used in export industries, and the establishment of free trade zones for export industries. Such incentive programmes can change the composition of overall investment by attracting investment away from non-priority sectors—those that do not benefit from the incentives—toward the priority industrial sectors promoted through these policies. Malaysia, like most developing countries, has tended to follow a mixed strategy of encouraging import substitution as well as export promotion and as pointed out by Greenaway and Milner [6], among others, the actual net effects of simultaneously pursuing policies which have conflicting net effects on internal prices may be far different from those intended. This is because of the degree of substitutability among goods, both in terms of production and consumption. No completely satisfactory method exists for estimating the size of this substitution or resource-allocation effect because of the difficulties in specifying the technical and behavioral relationships that generate the observed data. Partial equilibrium indices such as the effective rate of protection (ERP), the domestic resource cost (DRC), and the implicit rate of protection are often used to measure the degree of protection offered to various industries through various incentive programmes. In addition to the usual criticisms of partial-equilibrium analysis, however, Evans [5] has shown that crucial factors are ommitted from such partial-equilibrium analyses. In the case of Malaysia, for example, the country adopts a flexible exchange rate system so that the amount

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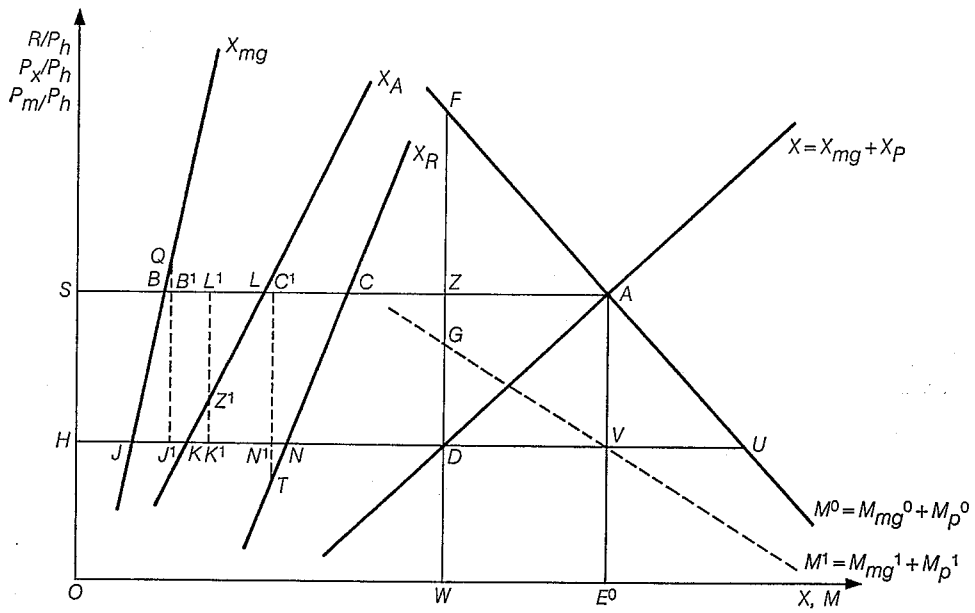
Fig. 1.



Notes:
1. $X_p = X_A + X_R$ where X_p is exports of all primary products, X_R is exports of rubber, and X_A is exports of primary products excluding rubber.
2. X_{mg} is exports of manufactures and total exports is X where $X = X_{mg} + X_p$.
3. Total importables, M, comprises imports of manufactures, M_{mg}, and imports of primary products, M_p.
4. For simplicity, assume there are no cross-price effects between exportables and importables.
5. The horizontal axis measures imports and exports in terms of exports.
6. R/P_h is the real exchange rate, R is nominal exchange rate, P_h is price of home goods, P_x and P_m are prices of exportables and importables respectively.

of appreciation/depreciation of its currency depends on the state of the different markets in trade and at the same time, each of the policies exert different substitutional and resource allocation effects as explained in Greenaway and Milner [6]. Figure 1 provides a simple illustration of the importance of knowing not only the size of the tariff/subsidy but also the incidence of such measures on exportables, importables, and non-tradeables.

Initially, under a free trade regime with equilibrium in the balance of trade, the exchange rate is *OS*, total volume of trade is *SA*, exports of manufactures *SB*, exports of rubber *SC*, and exports of primary products excluding rubber *SL*. However, if the country is on a flexible exchange rate system, then with excessive or high protection of industries, for example, the currency becomes overvalued

and the new exchange rate is OH. At this new exchange rate there is excess demand (equal to DU) in the market for tradeables. This excess demand may be eliminated by a tariff of FD/DW or by licensing imports up to OW units. Either measure will raise the relative price of importables from ZW to FW and lower the relative price of exportables from ZW to DW. Hence exports of manufactures decrease from SB to HJ, exports of rubber decrease from SC to HN, and exports of primary products excluding rubber decrease from SL to HK.

If the government had imposed a tax of N^1T per unit of export of rubber, granted a subsidy of QJ^1 per unit of export of manufactures and subsidy of Z^1K^1 per unit of export of primary products other than rubber, then with the overvaluation of the currency, exports of rubber would have been taxed by L^1Z^1 (despite having received a gross subsidy of Z^1K^1) and manufactures would have received a net subsidy of QB^1 per unit of export. Thus the net effects of the combination of policies is decrease in exports of rubber from SC to SC^1 and other primary products from SL to SL^1.

On the other hand, if the government had imposed an import tariff of AV/VE^0 and demand for importables had decreased from M^0 to M^1, then at the exchange rate OH there would be a potential trade deficit of DV. Hence, one needs to know the values of the incidence parameters in order to calculate the shift factor of a tariff/subsidy so as to determine the net result of the different policies implemented. If the net result is an increase in the proportionate relative price of exportables $(\hat{P}_x - \hat{P}_h)$, where the hat ($\hat{}$) denotes percentage change, then the net effect of the different measures adopted is to promote exports. The actual value of $(\hat{P}_x - \hat{P}_h)$ and $(\hat{P}_m - \hat{P}_h)$ are the actual net protective rates (*NPR*s) for exportables and importables respectively, while the estimated values of $(\hat{P}_x - \hat{P}_h)$ and $(\hat{P}_m - \hat{P}_h)$ are the respective net protective rates resulting from domestic trade and industrial policies and changes in income, assuming non-randomness of exogenous factors and the constancy of the various incidence parameters.

This study develops a general equilibrium model which builds upon Johnson [7] and the more recent computable general equilibrium (CGE) models found, for example, in de Melo and Robinson [2], Adelman and Robinson [1], and Dervis, de Melo, and Robinson [3]. The model takes into account the interactions between the importables, exportables, and home goods markets. General equilibrium is shown to be attained through changes in the structure of relative prices, where the prices of importable goods are assumed to be flexible, thereby allowing the home goods market to clear. The general equilibrium model has the following properties:

(a) The economy is in full employment, so that its production point is constrained to lie on the production possibility curve, the location and shape of which are determined by the economy's factor endowment and by technology.
(b) Consumer behavior satisfies the three general demand-theoretic restrictions of homogeneity, symmetry of the substitution effects, and additivity.
(c) The budget constraint links imports, exports, domestic expenditure, savings, and income. Imports in excess of exports, for example, will lead through the

budget constraint to domestic income being in excess of domestic expenditure on home goods, thereby maintaining the equality of total income and total expenditure.

Results for this general equilibrium model will show whether equilibrium prices of the various industries in the manufacturing sector have changed relative to the prices of non-tradeables.[1] The equilibrium prices of manufactures will be analyzed for both exportables and importables. Increases over time in the equilibrium relative prices of exports of manufactures indicate that exports have been encouraged by the incentives package; decreases in relative prices over time indicate the failure of the incentives package to encourage exports of manufactures, increases (decreases) in equilibrium relative prices over time indicate that rising (falling) protection has been granted to the manufacturing sector.

II. THE BASIC MODEL

The model (see Appendix) has three main building blocks: the consumption component where domestic consumer demands for the commodities yield a system of demand equations, the production component which yields the supply functions, and the budget constraint which links the first two components and gives rise to equilibrium conditions. It should be noted that the supply functions are implicit, because the input demand equations are not explicitly derived in the production component of the model. Dornbusch [4] has shown that equilibrium for the entire model may be reduced to a single equilibrium condition for the home goods market, implying trade balance equilibrium. This equilibrium in the home goods market is attained when excess demand for home goods is zero. Using the model outlined above and in the Appendix, in equilibrium,

$$(\hat{P}_x - \hat{P}_h) = -W_m(\hat{P}_m - \hat{P}_x) - W_y(\hat{Y}),$$

and

$$(\hat{P}_m - \hat{P}_h) = W_x(\hat{P}_m - \hat{P}_x) - W_y(\hat{Y}),$$

where W_m is an elasticity parameter showing the percentage change in the relative price of exportables resulting from a 1 per cent change in the price of importables relative to that of exportables, W_x is the shift parameter referred to by Greenaway and Milner [6] and is an elasticity parameter showing the percentage change in the relative price of importables resulting from a 1 per cent change in the price of importables relative to that of exportables, and W_y is an elasticity parameter showing the percentage change in the relative prices of exportables and importables as a result of a unit percentage change in income. These two equations were transformed (see Appendix) to the following two estimating equations:

$$\ln(P_x) = a_0 + a_1\ln(P_m) + a_2\ln(P_h) + a_3\ln(Y) + U_t, \tag{1}$$

$$\ln(P_m) = b_0 + b_1\ln(P_x) + b_2\ln(P_h) + b_3\ln(Y) + V_t. \tag{2}$$

[1] Services and the home goods sector are used as interchangeable terms to indicate the non-tradeables sector in this study.

When we extend the model to allow for the two main categories of tradeables, namely primary products and manufactures, we have the following two estimating equations:

$$\ln(P_{mg}{}^{x}) = c_0 + c_1\ln(P_h) + c_2\ln(P_m) + c_3\ln(P_p{}^{x}) + c_4\ln(Y), \tag{1.0}$$

$$\ln(P_{mg}{}^{m}) = d_0 + d_1\ln(P_h) + d_2\ln(P_m) + d_3\ln(P_p{}^{m}) + d_4\ln(Y). \tag{2.0}$$

From these two equations, estimates of the various incidence parameters are obtained to calculate the value of $(\hat{P}_{mg}{}^{x} - \hat{P}_h)$ and $(\hat{P}_{mg}{}^{m} - \hat{P}_h)$ where $\hat{P}_{mg}{}^{x}$ and $\hat{P}_{mg}{}^{m}$ are respectively the percentage change in the export and import price indices of manufactures and P_h is the percentage change in the price of home goods. An incentive package is said to have encouraged (discouraged) exports of manufactures if $(\hat{P}_{mg}{}^{x} - \hat{P}_h)$ is positive (negative). To determine if manufactures, classified in Malaysia as importables, are protected by the various policies implemented, the value of $(\hat{P}_{mg}{}^{m} - \hat{P}_h)$ is calculated. The value of $(\hat{P}_{mg}{}^{m} - \hat{P}_h)$ is the "net protective rate"[2] for imports of manufactures. In practice, a number of different policies are in force at the same time and their effects are not necessarily complementary. Furthermore, Malaysia's flexible exchange rate system leads to changes in the external value of the currency that are dependent on the state of the different markets in trade. Although the amount of currency appreciation (or depreciation) is known, it would still be difficult (if not impossible) to quantify the effects of each of the policies separately. This "net protective rate" shows the net result of the different policies implemented, as well as the effects of exogenous factors, not just that of tariffs and exchange rates.

III. EMPIRICAL ANALYSIS

Based on the model discussed above, the various incidence parameters for exports and imports of manufactures were estimated by the two-step full transformation method to correct for first-order serial correlation of errors. A description of the estimation method is found in SAS Institute [9]. The economy was divided into three sectors, namely, the primary sector (comprising agriculture, mining, and quarrying), manufacturing sector, and the home goods or non-tradeables sector (comprising construction, public utilities, and finance). Annual data for export and import price indices for manufactures for Peninsular Malaysia were limited to the 1965–85 sample period because such data were not available before 1965. Additional data limitations also necessitated a high degree of aggregation, with the breakdown of manufactures confined to SITC 6, 7, and 8. Unfortunately, SITC 0 to 5 contain both manufactured and non-manufactured goods. Data for exports and imports, and export and import price indices with 1970 = 100 were obtained from [8, various issues]. The GDP of Malaysia with 1970 = 100 was used as the measure of income.

[2] An illustration of why the change in the equilibrium relative price of importables has been called the "net protective rate" is given in Dornbusch [4, p. 180].

All the equations were corrected for first-order serial correlation because the Durbin-Watson statistics indicated that the null hypothesis of no first-order serial correlation in the errors could not be rejected at the 1 per cent level of significance. Estimates of the export and import parameters together with the levels of significance of the *t*-statistics, adjusted and unadjusted coefficients of determination ($\bar{R}^2$ and R^2, respectively) are presented in Tables I and II. The equations were separately estimated using the *old* price index of home goods (which includes food consumed outside the home) and the *new* price index of home goods (which as from 1980, excludes food consumed outside the home). The $\bar{R}^2$ and R^2 values were all high, the *F*-values exceeded the critical *F*-values both at the 1 per cent and 5 per cent levels of significance and the Durbin-Watson statistic was high enough to indicate that there was no autocorrelation problem. Thus, the model appears to be correctly specified, with expected signs for all the coefficient estimates.

The highly significant and positive regression coefficients of the prices of importables and exportables in equations (1) and (2) reflect the high substitutability between the two categories of goods. An increase in real income (through increasing purchasing power) will generally increase domestic demand for manufactures so that real income (*Y70*) has a more significant effect on importables than exportables (compare Table II with Table I). However, an increase in real income also indicates improvement in technology; this explains why *Y70* is more significant for exports of machinery and transport equipment (SITC 7) than for imports of the same. Prices of non-manufactures (which are principally primary products) are highly significant both for export and import of manufactures in general, and resource-based industries (SITC 6) in particular because primary products provide important raw materials in their production. Prices of home goods are obviously significant for exports of manufactures in SITC 7 and 8 and imports of all categories of manufactures if P_h is defined to include food consumed outside the home, because the price of home goods is an important element in the total cost of production.

From the estimates listed in Tables I and II one may calculate the shift parameter for importables and exportables in general and the various types of manufactures in order to show how much of Malaysia's protectionism has been shifted on as implicit taxes on exports as shown in Table III below.

Table III shows that between 54 to 74 per cent of protection for encouraging import-substituting industries is in fact borne by exportables in the form of implicit export taxes. This finding is consistent with the findings of Greenaway and Milner [6].[3] However, in the case of manufactures in general, protectionism has been successful in raising the price of manufactures relative to home goods, but this increase is only minimal especially when P_h is defined to exclude food consumed outside the home as the shift parameter ranges in value from 0 per cent for SITC 8 to 1 per cent for SITC 6 and 7, and 8 per cent for manufactures in general.

[3] See Greenaway and Milner [6, Table 2, p. 212] for a summary of inter-country comparison of estimates of the shift parameter.

TABLE I

ESTIMATES OF EXPORT PARAMETERS

	Dependent Variable	Constant Term	Regression Coefficients of:							$\bar{R}^2$	R^2
			$\ln(P_m)$	$\ln(P_h)$	$\ln(Y70)$	$\ln(P_p{}^x)$	$\ln(P_{mg6}{}^x)$	$\ln(P_{mg7}{}^x)$	$\ln(P_{mg8}{}^x)$		
(1)	$\ln(P_x)$*	−0.33	0.75	0.49	−0.09					0.87	0.95
		(0.83)	(0.01)	(0.11)	(0.75)						
		0.74	0.74	−0.04	0.07					0.83	0.94
		(0.61)	(0.03)	(0.95)	(0.86)						
(1.0)	$\ln(P_{mg}{}^x)$*	−2.40	0.40	0.31	0.06	0.68				0.97	0.98
		(0.04)	(0.10)	(0.20)	(0.77)	(0.00)					
		−1.81	0.31	0.14	0.07	0.79				0.97	0.98
		(0.09)	(0.21)	(0.65)	(0.76)	(0.00)					
(1.1)	$\ln(P_{mg6}{}^x)$*	−2.42	0.22	0.47	−0.25	0.64		0.34	0.33	0.97	0.98
		(0.08)	(0.45)	(0.09)	(0.50)	(0.01)		(0.53)	(0.19)		
		−1.28	0.04	−0.52	−0.18	0.82		0.91	0.38	0.98	0.98
		(0.37)	(0.90)	(0.35)	(0.65)	(0.00)		(0.31)	(0.26)		
(1.2)	$\ln(P_{mg7}{}^x)$*	−0.67	−0.02	−0.09	0.53	0.06	0.10		0.04	0.99	0.99
		(0.34)	(0.86)	(0.51)	(0.00)	(0.66)	(0.47)		(0.77)		
		−0.68	0.08	0.48	0.32	0.01	0.13		−0.17	1.00	1.00
		(0.04)	(0.35)	(0.00)	(0.00)	(0.95)	(0.09)		(0.10)		
(1.3)	$\ln(P_{mg8}{}^x)$*	1.71	0.40	−0.45	0.08	−0.03	0.34	0.22		0.97	0.97
		(0.24)	(0.14)	(0.12)	(0.83)	(0.92)	(0.23)	(0.71)			
		−0.25	0.51	1.14	0.16	−0.08	0.31	−1.15		0.99	0.98
		(0.78)	(0.00)	(0.00)	(0.55)	(0.72)	(0.10)	(0.09)			

Notes: 1. Method used is ordinary least squares regression, after correction for first-order serial correlation.
2. Figures in parentheses show the levels of significance of the *t*-statistics.
3. R^2 shows goodness of fit while the adjusted R^2 ($\bar{R}^2$) shows the goodness of fit after taking into account the effect of serial correlation.

* The equation uses the old price index for home goods; as from 1980, the new price index for home goods excludes food consumed in restaurants, fast-food centers, and other eating places.

TABLE II

ESTIMATES OF IMPORT PARAMETERS

Dependent Variable		Constant Term	Regression Coefficients of:							$\bar{R}^2$	R^2
			$\ln(P_x)$	$\ln(P_h)$	$\ln(Y70)$	$\ln(P_p{}^m)$	$\ln(P_{mg6}{}^m)$	$\ln(_{mg7}{}^m)$	$\ln(P_{mg8}{}^m)$		
(2)	$\ln(P_m)$*	−2.61	0.43	−0.19	0.67					0.97	0.98
		(0.02)	(0.02)	(0.04)	(0.00)						
		−2.90	0.34	0.45	0.42					0.93	0.98
		(0.00)	(0.03)	(0.24)	(0.09)						
(2.0)	$\ln(P_{mg}{}^m)$*	−1.13	−0.13	0.24	0.36	0.41				0.98	0.99
		(0.06)	(0.24)	(0.09)	(0.00)	(0.00)					
		−0.50	−0.09	−0.53	0.63	0.46				0.98	0.99
		(0.23)	(0.26)	(0.00)	(0.00)	(0.00)					
(2.1)	$\ln(P_{mg6}{}^m)$*	−0.27	−0.08	0.09	0.10	0.39		0.64	−0.20	0.99	0.99
		(0.68)	(0.53)	(0.59)	(0.49)	(0.01)		(0.00)	(0.27)		
		0.52	−0.01	−0.80	0.37	0.51		0.14	0.31	0.99	0.99
		(0.34)	(0.90)	(0.02)	(0.06)	(0.00)		(0.54)	(0.20)		
(2.2)	$\ln(P_{mg7}{}^m)$*	−1.03	−0.11	0.24	0.18	−0.02	0.73		0.02	0.99	0.99
		(0.15)	(0.14)	(0.18)	(0.30)	(0.91)	(0.01)		(0.94)		
		0.21	−0.01	−0.77	0.39	0.11	0.39		0.44	0.99	0.99
		(0.72)	(0.90)	(0.04)	(0.05)	(0.57)	(0.19)		(0.10)		
(2.3)	$\ln(P_{mg8}{}^m)$*	−1.47	−0.06	−0.01	0.64	0.37	−0.15	−0.11		0.97	0.98
		(0.13)	(0.72)	(0.95)	(0.00)	(0.10)	(0.68)	(0.75)			
		−1.39	0.00	1.09	−0.13	−0.20	0.36	0.32		0.99	0.99
		(0.01)	(0.99)	(0.00)	(0.57)	(0.32)	(0.25)	(0.21)			

Notes: 1. Method used is ordinary least squares regression, after correction for first-order serial correlation.
2. Figures in parentheses show the levels of significance of the *t*-statistics.
3. R^2 shows the goodness of fit while the adjusted R^2 ($\bar{R}^2$) shows the goodness of fit after taking into account the effect of serial correlation.

* The equation uses the old price index for home goods; as from 1980, the new price index for home goods excludes food consumed in restaurants, fast-food centers, and other eating places.

TABLE III

ESTIMATE OF SHIFT PARAMETERS FOR 1965–85

		With P_h Defined to Include Food Consumed outside the Home	With P_h Defined to Exclude Food Consumed outside the Home
(A) W_m:	Total	−0.74	−0.54
	Manufactures	0.12	0.08
	SITC 6	0.07	0.01
	SITC 7	0.10	0.01
	SITC 8	0.06	0
(B) W_x:	Total	−3.08	−2.87
	Manufactures	−0.67	−0.46
	SITC 6	0.27	−0.02
	SITC 7	0.02	−0.08
	SITC 8	−0.68	—

Note: SITC 6=resource-based industries; SITC 7=machinery and transport equipment; and SITC 8=miscellaneous manufactured articles.

However, section (B) of the Table III shows that when the price of importables relative to exportables increases by 1 per cent (e.g., through tariff imposition), the price of importables and exportables drops relative to home goods indicating that tradeables and home goods are close substitutes and this is true for manufactures in general, especially miscellaneous manufactured goods.

Using our estimates of the various incidence parameters, the *average* net protective rates (*NPRs*) for imports and exports of manufactures in the SITC 6 to 8 categories were calculated for two time periods: 1965–75 for the import-substitution phase and 1976–85 for the export-promotion phase. These *NPRs* show the net result of *all* the different policies implemented as well as the effects of exogenous factors, not just that of tariffs and exchange rates. The estimated values of $(\hat{P}_x - \hat{P}_h)$, $(\hat{P}_{mg}{}^x - \hat{P}_h)$, $(\hat{P}_{mg6}{}^x - \hat{P}_h)$, $(\hat{P}_{mg7}{}^x - \hat{P}_h)$, and $(\hat{P}_{mg8}{}^x - \hat{P}_h)$ and of the corresponding import counterparts, were decomposed into two components: a component arising from income changes (given by the elasticity times the percentage change in income) and a component resulting from commercial and industrial policies. The difference between the actual values of $(\hat{P}_x - \hat{P}_h)$, $(\hat{P}_m - \hat{P}_h)$, $(\hat{P}_{mg}{}^x - \hat{P}_h)$, $(\hat{P}_{mg}{}^m - \hat{P}_h)$, $(\hat{P}_{mg6}{}^x - \hat{P}_h)$, $(\hat{P}_{mg6}{}^m - \hat{P}_h)$, $(\hat{P}_{mg7}{}^x - \hat{P}_h)$, $(\hat{P}_{mg7}{}^m - \hat{P}_h)$, $(\hat{P}_{mg8}{}^x - \hat{P}_h)$, and $(\hat{P}_{mg8}{}^m - \hat{P}_h)$ and their respective estimated values are the components attributed to exogenous factors such as changes in world prices. These average *NPRs* for importables and exportables are shown in Table IV.

Table IV shows that:

(a) Protectionism was higher for importables during the import-substitution phase (1965–75) and higher for exportables during the export-promotion phase (1976–85).

(b) The average *NPR* has been positive but generally low both for importables and exportables. Although this shows that in general commercial and trade policies

TABLE IV

AVERAGE NET PROTECTIVE RATE FOR PENINSULAR MALAYSIA

(%)

	Importables		Exportables	
	1965–75	1976–85	1965–75	1976–85
Actual $(\hat{P}_m - \hat{P}_h)$	5.46	3.05	0.58	4.04
Estimated $(\hat{P}_m - \hat{P}_h)$	1.21	5.19	4.03	1.73
(a) Due to exogenous factors	4.25	−2.14	−3.45	2.31
(b) Due to income	−8.90	4.58	2.48	−0.61
(c) Due to domestic policies	10.11	0.61	1.54	2.34
Actual $(\hat{P}_{mg}{}^m - \hat{P}_h)$	4.57	1.63	1.86	5.17
Estimated $(\hat{P}_{mg}{}^m - \hat{P}_h)$	4.23	1.73	3.35	3.44
(a) Due to exogenous factors	0.34	−0.10	−1.49	1.73
(b) Due to income	−2.27	2.47	−0.69	0.40
(c) Due to domestic policies	6.50	−0.74	4.04	3.04
Actual $(\hat{P}_{mg6}{}^m - \hat{P}_h)$	4.96	1.94	2.02	5.35
Estimated $(\hat{P}_{mg6}{}^m - \hat{P}_h)$	5.03	2.47	3.18	4.62
(a) Due to exogenous factors	−0.07	−0.53	−1.17	0.73
(b) Due to income	−0.69	0.71	2.23	−1.68
(c) Due to domestic policies	5.72	1.76	0.95	6.30
Actual $(\hat{P}_{mg7}{}^m - \hat{P}_h)$	4.83	0.96	1.14	4.18
Estimated $(\hat{P}_{mg7}{}^m - \hat{P}_h)$	4.61	4.20	1.90	2.14
(a) Due to exogenous factors	0.22	−3.24	−0.76	2.04
(b) Due to income	−1.15	1.22	−3.68	3.62
(c) Due to domestic policies	5.76	2.98	5.58	−1.48
Actual $(\hat{P}_{mg8}{}^m - \hat{P}_h)$	2.64	4.60	3.10	4.68
Estimated $(\hat{P}_{mg8}{}^m - \hat{P}_h)$	3.34	4.08	2.11	3.72
(a) Due to exogenous factors	−0.70	0.52	0.99	0.96
(b) Due to income	−4.27	4.34	−0.96	0.55
(c) Due to domestic policies	7.61	−0.26	3.07	3.17

Notes: 1. P_h was defined to exclude food consumed outside the home.
2. For exportables, the corresponding actual and estimated values of *NPR*s are for $(\hat{P}_x - \hat{P}_h)$, $(\hat{P}_{mg}{}^x - \hat{P}_h)$, $(\hat{P}_{mg6}{}^x - \hat{P}_h)$, $(\hat{P}_{mg7}{}^x - \hat{P}_h)$, and $(\hat{P}_{mg8}{}^x - \hat{P}_h)$.

in Peninsular Malaysia have encouraged trade, nevertheless *real* protection has been lower than nominal protection because of implicit taxes through substitutional relationships and negative income effects. This is further supported by the fact that generally, protectionism due to domestic policies exceeded actual protectionism.

(c) In so far as trade policies and incentives had aimed primarily at promoting the manufacturing sector they can be said to have failed in the period 1965–75 but were successful subsequently during 1976–85 as can be seen in the lower *NPR* for manufacturing relative to the national average for 1965–75 but a higher relative *NPR* for manufacturing during 1976–85.

(d) In general during the import-substitution phase, the effectiveness of protec-

tionism was reduced through a reduction in real income as shown in the negative income effect for all goods except exports in general and exports of resource-based industries. This negative net protective effect of income is an apparent contradiction because advancement of the economy and the industrialization process should result in less imports and more exports of manufactures. This contradictory result indicates that the industrialization strategy adopted had not been entirely successful. Malaysia should and did switch from a primarily import-substituting strategy to a primarily export-promotion strategy, but the failure during the export-promotion phase of 1976–85 is that this export-promotion strategy should emphasize the promotion of *resource-based industries* (i.e., SITC 6) in which Malaysia has comparative advantage rather than consumer durables which are highly capital-intensive and have low value-added (e.g., SITC 7). As can be seen in the decomposition of protective effects for exports of SITC 7, the main component is the income component indicating the importance of high technology imported by foreign investors in those industries. The domestic policies component is in fact negative and care should be exercised to ensure that the import-substitution phase is not extended through the promotion of goods in which Malaysia does not have comparative advantage. Comparing the income elasticities for exportables and importables, the income elasticities are higher for exportables (except for imports of SITC 8, miscellaneous manufactured articles). This result is to be expected since domestic income reflects domestic purchasing power and, therefore, is a more important and relevant factor for domestic demand than for foreign demand. The lower income elasticity for imports, compared to exports, of SITC 8 probably reflects the advance in the industrialization process and the success of the import-substituting policy, so that it is less necessary to import-substituting policy, so that it is less necessary to import relatively simple manufactured articles (SITC 8) even though demand for manufactured articles continues to increase with rising income.

(e) In promoting exports, protectionism was generally biased in favor of manufactures. The significant impact of domestic policies compared to the insignificance of exogenous factors for importables during the import-substitution phase and exportables during the export-promotion phase shows the importance of government policies in the success of the country's industrialization strategies.

IV. CONCLUSION

The Malaysian government has actively pursued its aim of industrialization of the economy especially since its Third Malaysia Plan. It has used a variety of incentives to promote both export-oriented as well as import-substituting industries. However, this study shows that because of differences in the strength and direction of substitutional relationships among industries and the income effect, true protection appears to be considerably less than nominal protection. In addition, although the government has succeeded in switching from import-substitution policies to export-promotion policies which are biased in favor of the manufacturing sector, nevertheless the study points to a need for a revamp of the existing incentives package to reduce, if not eliminate, implicit undesired effects of the incentives

especially for high-technological and capital-intensive manufactures involving machinery and transport equipment. The relative importance of exogenous factors in the promotion of such capital-intensive industries should be carefully considered by the government. After recovering from the global recession of the early 1980s the government has turned increasingly to attracting foreign direct investment (FDI) especially in the manufacturing sector so that FDI tripled from M$3.1 billion in 1986 to M$9.4 billion in 1990 and evaluation of the success of trade policies after 1985 must take into consideration the impact of FDI.

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APPENDIX

The demand for home goods, D, depends on the relative prices of exportables and importables and on income, Y.

$$D = D(R_x, R_m, Y), \tag{1}$$

where $R_x = P_x/P_h$ and $R_m = P_m/P_h$; P_x is the domestic price of exportables, P_m is the domestic price of importables, and P_h is the price of home goods. The supply of home goods, S, depends on the relative prices of exportables and importables and on income, which is a proxy for productive factors (capital and labor) and technology.

$$S = S(R_x, R_m, Y). \tag{2}$$

General equilibrium is attained when $D = S$, or excess demand for home goods

is zero, because equilibrium in the home goods market implies trade balance equilibrium as well. If equilibrium is displaced (for example, through imposition of a tariff on imports that changes relative prices), the home goods market will be in equilibrium again when $\hat{D} = \hat{S}$, where the hat ($\hat{}$) denotes percentage change. From the total differentials of equations (1) and (2) and some manipulation, the following relationships stated in terms of elasticities are obtained:

$$\hat{D} = \eta_x \hat{R}_x + \eta_m \hat{R}_m + \eta_y \hat{Y}, \tag{3}$$

and

$$\hat{S} = \varepsilon_x \hat{R}_x + \varepsilon_m \hat{R}_m + \varepsilon_y \hat{Y}, \tag{4}$$

where

η_x = elasticity of demand for home goods with respect to the relative price of exportables,

η_m = elasticity of demand for home goods with respect to the relative price of importables,

η_y = income elasticity of demand for home goods,

ε_x = elasticity of supply of home goods with respect to the relative price of exportables,

ε_m = elasticity of supply of home goods with respect to the relative price of importables,

ε_y = income elasticity of supply of home goods.

Equations (3) and (4) state that $\hat{D}$ and $\hat{S}$ are the weighted sums of the percentage changes in the relative prices of exportables, importables, and income. Equations (3) and (4) may be restated as:

$$\hat{D} = \eta_x(\hat{P}_x - \hat{P}_h) + \eta_m(\hat{P}_m - \hat{P}_h) + \eta_y(\hat{Y}), \tag{3a}$$

$$\hat{S} = \varepsilon_x(\hat{P}_x - \hat{P}_h) + \varepsilon_m(\hat{P}_m - \hat{P}_h) + \varepsilon_y(\hat{Y}). \tag{4a}$$

In equilibrium $\hat{D} = \hat{S}$. Hence:

$$\gamma_x(\hat{P}_x - \hat{P}_h) + \gamma_m(\hat{P}_m - \hat{P}_h) + \gamma_y(\hat{Y}) = 0, \tag{5}$$

where $\gamma_x = \eta_x - \varepsilon_x$, $\gamma_m = \eta_m - \varepsilon_m$, and $\gamma_y = \eta_y - \varepsilon_y$.

γ_x and γ_m are the elasticities of the excess demand function for home goods with respect to the relative price of exportables and importables, respectively, and γ_y is the elasticity of the excess demand function for home goods with respect to income. Equation (5) states that general equilibrium is reestablished through changes in the prices of importables and exportables relative to the prices of home goods and also through changes in income if income is not held constant.

For exportables, $P_x = eP_x^*$, where e is the nominal exchange rate of currency and P_x^* is the world price index of exportables. For importables, $P_m = eP_m^*(1 + t)$ where P_m^* is the world price index of importables and t is the tariff on imports. Let $T = 1 + t$, $P = P_m/P_x$, and $P^* = P_m^*/P_x^*$, so that:

$$R_m/R_x = P = P^*T. \tag{6}$$

We assume P^* is exogenous. This is a reasonable assumption because Malaysia is a small, open economy and although it is the world's major exporter of rubber, tin, and palm oil, prices are determined by producing and consuming countries through the use of buffer stocks and international agreements. Hence equation (6) yields:

$$\hat{T} = (\hat{P}_m - \hat{P}_x) - (\hat{P}_m^* - \hat{P}_x^*). \tag{7}$$

Substituting equation (7) into equation (5), we get:

$$\hat{P}_x - \hat{P}_h = -\frac{\gamma_m}{\gamma_x}[\hat{T} + \hat{P}_x + (\hat{P}_m^* - \hat{P}_x^*) - \hat{P}_h^*] - \frac{\gamma_y}{\gamma_x}(\hat{Y}),$$

$$\hat{P}_x - \hat{P}_h = -\frac{\gamma_m}{\gamma_x + \gamma_m}[\hat{T} + (\hat{P}_m^* - \hat{P}_x^*)] - \frac{\gamma_y}{\gamma_x + \gamma_m}(\hat{Y}). \tag{8}$$

Equation (8) shows that the effects of a tariff will depend on the substitution or complementary relationship between home goods and the two traded goods. Using equations (7) and (8), we obtain the following:

$$\hat{P}_x - \hat{P}_h = -W_m(\hat{P}_m - \hat{P}_x) - W_y(\hat{Y}), \tag{9}$$

and

$$(\hat{P}_m - \hat{P}_h) = W_x(\hat{P}_m - \hat{P}_x) - W_y(\hat{Y}), \tag{10}$$

where $W_m = \gamma_m/(\gamma_x + \gamma_m)$ is an elasticity parameter showing the percentage change in the relative price of exportables resulting from a 1 per cent change in the price of importables relative to that of exportables; and $W_y = \gamma_y/(\gamma_m + \gamma_x)$ is an elasticity parameter showing the percentage change in the relative prices of exportables and importables as a result of a unit percentage change in income.

Treating W_m, W_x, and W_y as constants, equations (9) and (10) yield the following specifications for estimation purposes:

$$\ln(P_x/P_h) = a - W_m\ln(P_m/P_x) - W_y\ln(Y) + U_t, \tag{11}$$

$$\ln(P_m/P_h) = b + W_x\ln(P_m/P_x) - W_y\ln(Y) + V_t, \tag{12}$$

where a, b, W_m, W_x, and W_y are parameters to be estimated, and U_t and V_t are error terms assumed to have mean zero and constant variance.

If data for P_m^* and P_x^* were available, changes in the net protective rates can be decomposed into three components: a component arising from changes in T (which reflects the effects of domestic industrial and trade policies), a component arising from changes in world prices, and a component arising from changes in income. However, because of data limitations for the Malaysian case, such a decomposition will not be pursued.

Direct application of ordinary least squares (OLS) estimation of equations (11) and (12) can lead to simultaneous equations bias since the endogenous variable is common to both sides of those equations. Therefore, equation (11) is transformed to:

$$\ln(P_x) = a_0 + a_1\ln(P_m) + a_2\ln(P_h) + a_3\ln(Y) + U_t, \tag{13}$$

and the parameters are estimated using the OLS method. The values of a, W_m, and W_y are calculated according to: $a_0 = a/(1 - W_m)$, $a_1 = -W_m/(1 - W_m)$, $a_2 = 1/(1 - W_m)$, and $a_3 = -W_y/(1 - W_m)$.

Similarly, equation (12) is transformed to:

$$\ln(P_m) = b_0 + b_1\ln(P_x) + b_2\ln(P_h) + b_3\ln(Y) + V_t, \tag{14}$$

and W_x is calculated from $b_1 = -W_x/(1 - W_x)$.

The model can be extended to allow for different categories of exportables or importables. With disaggregation of export categories, equation (5) can be expressed as:

$$\sum_j \gamma_j(\hat{P}_j - \hat{P}_h) + \gamma_m(\hat{P}_m - \hat{P}_h) + \gamma_y\hat{Y} = 0. \tag{15}$$

In the case of Malaysia, the main export categories are primary product exports, X_p, and exports of manufactures, X_{mg}. Hence these are the categories that this study will focus on. From equation (15):

$$\gamma_{mg}\hat{P}_{mg} + \gamma_p\hat{P}_p + \gamma_m\hat{P}_m = (\gamma_{mg} + \gamma_p + \gamma_m)\hat{P}_h - \gamma_y\hat{Y}, \tag{16}$$

where $\sum_j \gamma_j = \gamma_{mg} + \gamma_p$ and $\hat{P}_{mg}$ and $\hat{P}_p$ are the percentage changes in the export price index of manufactures and of primary products, respectively. Let $\gamma = \gamma_{mg} + \gamma_p + \gamma_m$ and $W_{mg} = \frac{\gamma_{mg}}{\gamma}$, $W_p = \frac{\gamma_p}{\gamma}$, $W_m = \frac{\gamma_m}{\gamma}$, and $W_y = \frac{\gamma_y}{\gamma}$, so that $W_{mg} + W_p + W_m = 1$. From equation (16) we obtain:

$$\hat{P}_h = W_{mg}\hat{P}_{mg} + W_p\hat{P}_p + W_m\hat{P}_m + W_y\hat{Y}. \tag{17}$$

Using exports of manufactures as a "numeric," equation (17) can be expressed as:

$$\hat{P}_{mg} - \hat{P}_h = W_{mg}(\hat{P}_{mg} - \hat{P}_{mg}) + W_p(\hat{P}_{mg} - \hat{P}_p) + W_m(\hat{P}_{mg} - \hat{P}_m) - W_y(\hat{Y}), \tag{18}$$

because $W_{mg} + W_p + W_m = 1$.

Equation (18) forms the basis for the following estimating equation:

$$\ln(P_{mg}/P_h) = c + W_p\ln(P_{mg}/P_p) + W_m\ln(P_{mg}/P_m) - W_y\ln(Y) + U_t. \tag{19}$$

Again, to overcome the problem of simultaneous equations bias, equation (19) is transformed to:

$$\ln(P_{mg}) = d_0 + d_1\ln(P_h) + d_2\ln(P_p) + d_3\ln(P_m) + d_y\ln(Y), \tag{20}$$

and estimated using the OLS method.