Trade Protection and Employment in Manufacturing: the Case of Malaysia

Evelyn DEVADASON*
University of Malaya

Abstract. The primary focus of the study is on employment responses to trade policy in the 1990s. Although tariffs and export duties in manufacturing were substantially reduced, quantitative restrictions were scaled up in the 1990s. The results suggest that trade liberalisation *via* the dismantling of trade barriers is desirable given the positive impact on aggregate employment, both skilled and unskilled. Conversely, only unskilled labour showed significant response to the imposition of licensing requirements. The *type* of licensing mattered as higher import licensing permits reduced unskilled labour demand whilst export licensing had the opposite effect on the latter. Non-tariff barriers rather than tariffs are thus more likely, if any, to have a bearing on skill inequality in manufacturing.

Keywords: Trade liberalisation, tariffs, non tariff barriers, employment, skill inequality
JEL classification: J23, F16

1. Introduction

Since trade reforms overlap partially with labour reforms, several studies have sought to establish these links. Prior evidence in developing countries in particular indicates a lack of employment response to trade reforms. For example, firms in Morocco chose to adjust to trade reforms by reducing profit margins and raising productivity (Currie and Harrison 1997), whilst adjustments to trade reforms in Mexico resulted in increased average wages for skilled workers (Revenga 1997; Harrison and Hanson 1999).

The bulk of the discussion on trade reforms in the Malaysian manufacturing in the past has been on tariff barriers. Though there has been an increase and reliance on both import and export licensing, discussion on non-tariff barriers has not gone beyond a simple listing of the instruments and commodities covered. Athukorala (2002) points out that the import restraining effects of these controls are not known. It is therefore timely to examine the extent of trade protection (both tariff and non tariff barriers) and the implications for labour demand. The study contributes to the debate on trade and employment linkages in two aspects. First, using a new data set combining trade, labour and industrial statistics for industries at the 5-digit level, the study establishes the links between trade policy and employment. Second, the estimates of tariffs can be compared with that of non-tariff barriers.

The paper is structured in the following manner. Section 2 illustrates the data employed for the study. Section 3 discusses the variation across industries in terms of protection levels. Section 4 then examines the relationship between the various types of protection on employment. Section 5 concludes.

* Department of Economics, Faculty of Economics & Administration, University of Malaya, 50603 Kuala Lumpur, Malaysia.
Email: *evelyns@um.edu.my*

2. Data: Concordance and Construction

Since the detailed non-trade data for Malaysian industries remains as unpublished, the analyses would have to be restricted to selected years for comparison. The years chosen are 1990, 1993 and 2000 as data on licensing requirements are not available prior to 1990.

The unpublished disaggregated data of employment and wages by occupation is drawn from industrial surveys, canvassed by the Department of Statistics Malaysia. The surveys cover industries at the 5-digit Malaysia Industrial Classification (MIC 1972, thereafter revised to Malaysia Standard Industrial Classification (MSIC) in 2000). This level of data disaggregation is important for the study due to the substantial variability observed across 5-digit industries.

The study only considers full-time paid employees[1], which excludes working proprietors and active business partners, unpaid family workers and part-time paid employees. Full-time paid employees refer to paid workers who work for at least 6 hours a day and at least 20 days a month. Similarly, only annual salaries and wages of full-time paid employees are taken into account. Salaries and wages are deflated by the consumer price index. The wage measures used for the study refer to the real annual full-time wages divided by the number of full-time employees.

The definition of skills used for the study is based on occupational groupings. Skilled workers refer to those in the managerial, professional, supervisory and technical category while unskilled workers refer to production/operative workers. The real average wages for skilled and unskilled workers are constructed based on their average yearly earnings, as in the case of total average wages. Other industry measures employed comprise value-added and inward foreign direct investment. Value-added is deflated by the Gross Domestic Product deflator.

The labour and industry data is then merged with trade data. Due to the non-availability of a concordance table to match trade and labour data in Malaysia at a disaggregated level beyond the two-digit sectors, a concordance table was established for the analyses. The trade data, which identifies thousands of relevant products, cannot be mapped to one particular industry in the MIC (or the MSIC). Thus, the trade data was aggregated to 3-digit after performing the concordance with the industrial classification. The final number of sub-industries obtained for the analysis for the selected years and the breakdown by major industrial groups is as presented in Appendix 1. Though 72 industries were obtained for the analysis in 2000 (Appendix 1), the remaining two years comprise a smaller number of industries. This is due to the unpublished labour and industrial data obtained for those years that have merged some industries at the 5-digit MIC level.

The data on exports and imports are derived from the Malaysia: External Trade Statistics publications. The data is compiled for industries at the 3-digit Standard International Trade Classification (SITC) level. Exports do not include re-exports. Exports are valued to explain f.o.b. while imports to explain c.i.f. Both exports and imports are in ringgit Malaysia at current prices. Total manufacturing imports and exports is deflated with the import price and export price index (1980 =100) for the entire economy respectively.

[1] Full-time employees represent approximately 99 per cent of the total number of persons engaged in the manufacturing sector.

Industry-specific average tariff rates and export duties are constructed using a concordance between the MIC (and MSIC) with the SITC categories under which tariff rates and export duties are specified. They are calculated by dividing import duty by import values, and export duty by export values. The import duty and export duty rates at the 9-digit SITC were obtained from the publication Malaysian Trade Classification and Customs Duties Order for the selected years. The import duty and export duty values were calculated at the 9-digit SITC and then aggregated to the 3-digit SITC in order to obtain the average rates for the empirical estimation based on the industries identified in the study. Specific tariffs were converted to their *ad valorem* equivalents, using values and prices. Export duties were also calculated in a similar manner.

As for license coverage data, the products that require licensing at the 9-digit SITC were obtained from the same publication: Malaysian Trade Classification and Customs Duties Order. For the study, two measures were used to capture the coverage of quantitative restrictions. The first measure was the proportion of products subject to import licensing and export licensing as a percentage of total number of products in that industry. The second was the value of imports (exports) in total imports (total exports) that was subject to import licensing (export licensing).[2] Though coverage ratios are criticized as a measure of trade protection, the existing information on these restrictions is exploited since trade reforms in the 1990s were not confined merely to tariff and export duty reductions.

3. Levels of Trade Protection Across Industries

The Malaysian manufacturing sector is considered to be relatively open. Openness, however, is not confined merely to trade flows, but is also based on the levels of protection, both tariff and non-tariff barriers. Table 1 presents the average tariff rates and export duties for the 19 major industrial groups in manufacturing (For discussion purposes, the trade protection levels are presented for the 19 major industrial groups within manufacturing, though the cross-section estimates for this study comprises a detailed number of industries).

Malaysia cuts tariffs both on a unilateral basis and on a preferential basis in trade within the Association of Southeast Asian Nations (ASEAN). Table 1 shows that the average tariff rate for the manufacturing sector declined by 41 per cent, from 11 per cent to 6 per cent between 1990 and 2000. Significant tariff reductions are observed for a majority of the industries within manufacturing between 1990 and 2000 (except for beverages and tobacco and basic metal products). The average tariff rates in the beverages and tobacco industry remain relatively high due to the high import duties on tobacco. As for basic metal products, the protection is towards basic iron and steel in line with the heavy industry emphasis in Malaysia (Khalifah 1996). Though the tariff rates on the overall transport equipment industry appear to be low (see Table 1), it should be noted that import duties on automobiles, vans and motorcycles were increased from 30 to 200 per cent to 40 to 300 per cent for completely build-up and from 4 to 42 per cent to 30 to 80 per cent for completely knocked down in 1998 (Athukorala 2002).

[2] There could be cases in which there are no imports or exports of a product that are subject to licensing for that particular year, and therefore the number of products subject to licensing would overestimate the coverage of quantitative restrictions for that industry. Arguably though, the proportion of products subject to licensing within an industry reflects the extent of non-tariff barriers in an industry analysis.

Table 1: Average import and export duties, 1990-2000

Industry	Import duty (%)			Export duty (%)			% Change 1990-2000
	1990	1993	2000	1990	1993	2000	Import duty
Food	23.52	5.53	1.47	0.54	0.33	0.17	-93.75
Beverages & Tobacco	177.52	118.58	211.94	0	0	0	19.39
Textile & Textile Products	26.53	12.57	10.78	0	0	0	-59.37
Leather & Leather Products	20.52	10.23	0.46	0	0	0	-97.76
Wood & Wood Products	22.40	24.04	5.53	0	0	1.25	-75.31
Furniture & Fixtures	19.69	28.68	17.87	0	0	0	-9.24
Paper, Printing & Publishing	6.73	6.25	5.54	0	0	0	-17.68
Chemical & Chemical Products	3.03	2.96	1.92	0	0	0	-36.63
Petroleum Products	0.47	1.01	neg	23.62	21.55	6.70	-99.36
Rubber Products	12.34	9.44	6.66	0	0	0	-46.03
Plastic Products	51.64	8.55	11.23	0	0	0	-78.25
Non-Metallic Mineral Products	16.60	9.16	10.74	0.14	0.12	0.13	-35.30
Basic Metal Products	7.46	8.38	8.73	0.09	neg	0.01	17.02
Fabricated Metal Products	10.61	11.68	9.44	0	0	0	-11.03
Machinery Manufacturing	4.83	4.94	1.28	0	0	0	-73.50
Electrical & Electronic Products	10.84	8.56	1.52	0	0	0	-85.98
Transport Equipment	11.83	3.69	4.49	0	0	0	-62.05
Scientific & Measuring Equipment	2.87	2.59	0.14	0	0	0	-95.12
Miscellaneous	25.28	16.65	13.76	0	0	0	-45.57
TOTAL	10.76	6.82	6.32	5.79	2.87	0.48	-41.26

Note: neg.- negligible.
Source: Calculations based on (i) Department of Statistics, *Malaysia: External Trade Statistics*, various years; (ii) Department of Statistics, *Malaysia: Malaysian Trade Classification and Customs Duties Order*, various years.

Unlike tariffs, export duties have been lifted for most industries. Manufactured exports virtually enjoy free trade through export duty exemptions. By 2000, export duties remained in only four industries, namely petroleum, followed by food products, non-metallic mineral products and basic metal products.

In contrast to tariffs and export duties, quantitative restrictions in the form of import and export licensing requirements have been scaled up (see Table 2). Import licensing (IL) had increased from 8 per cent in 1990 to 14 per cent of total products in 2000, while export licensing (EL) had almost doubled between both years. Obviously, quantitative restrictions are becoming important instruments of trade policy in Malaysia.

The permits required vary across industries, as reported in Table 2. Import licensing requirements have been relatively high in the food industry since 1990. Imports of meat and poultry products in particular are regulated through licensing to ensure that they originate from facilities that have been approved by Malaysian authorities as 'halal' or acceptable for consumption by Muslims. Other industries that have seen increasing import requirements since 1990 to record high levels in 2000 are electrical and electronics, basic metal, chemicals and transport equipment. The high import licensing requirements for these industries is a result of public health, security and protection purposes.

Conversely, export-licensing requirements remain high for textiles and wood products industries. For textile products, export licenses are used to ensure compliance with bilateral export restraint agreements. There are also industries that are not subject to any kind of licensing, namely leather products and furniture.

In total, Malaysia is still considered a relatively open economy based on its current trade protection levels.[3] Malaysia's CEPT (Common Effective Preferential Tariff) tariff rate at 2.73 per cent in 2000 was lower than the average rate of 3.87 per cent for the ASEAN (ASEAN Secretariat). The concerns regarding the protection levels are based on the broader implications of the changes in the former on the labour market. Adjusting to the changes in trade barriers and licensing requirements as discussed above require some form of adjustment of resources. Understanding how adjustment occurs whether *via* employment responses, can provide essential insights as to the broader workings of the Malaysian labour market.

Table 2: Licensing requirements, 1990-2000

	Approved permits (% of total products)*					
	Import licensing			Export licensing		
Industry	1990	1993	2000	1990	1993	2000
Food	31.30	30.93	34.00	17.48	16.76	19.35
Beverages & Tobacco	6.90	7.50	2.08	0	0	0
Textile & Textile Products	5.49	4.24	2.87	47.76	40.04	44.89
Leather & Leather Products	0	0	0	0	0	0
Wood & Wood Products	5.32	7.22	7.05	59.57	59.79	26.36
Furniture & Fixtures	0	0	0	0	0	0
Paper, Printing & Publishing	0	0	3.47	2.15	2.14	5.45
Chemical & Chemical Products	4.02	4.26	15.73	0.24	0.24	13.59
Petroleum Products	0	0	2.08	2.33	0.22	4.17
Rubber Products	0	0	0	0	0	2.38
Plastic Products	3.47	2.44	8.21	0	0	13.57
Non-Metallic Mineral Products	2.06	1.04	1.96	8.25	11.46	12.75
Basic Metal Products	4.10	4.72	18.97	4.87	5.25	5.64
Fabricated Metal Products	1.15	1.15	6.38	0.38	0	8.41
Machinery Manufacturing	1.67	1.46	9.79	0	0	13.81
Electrical & Electronic Products	15.94	16.67	39.82	0	0.29	12.08
Transport Equipment	16.17	13.22	14.80	0	0	0.51
Scientific & Measuring Equipment	0	0	0	0.49	0.47	2.08
Miscellaneous	3.14	4.40	5.82	0.70	0.63	4.50
TOTAL	8.12	7.92	13.83	8.77	8.18	15.39

Note: * Represents number of approved permits divided by total number of products in each industry.
Source: Calculations based on (i) Department of Statistics, *Malaysia: External Trade Statistics*, various years; (ii) Department of Statistics, *Malaysia: Malaysian Trade Classification* and *Customs Duties Order*, various years.

[3] Wood and Ridao-Cano (1999) state that a country is classified as closed, either with average tariff rates of 40 per cent or more or non-tariff barriers covering 40 per cent or more.

The variation across industries in the levels and types of trade protection justifies the cross-section analysis employed in this study. A cross-section industry analysis is thus pertinent since trade reforms (changes in tariffs and other forms of protection) are usually implemented at the industry level. A reduction in tariffs, for example, that shifts industry product demand will move employment in the same direction, while wage adjustments may dampen the employment response. According to Revenga (1997), the magnitude of employment effects will ultimately depend on the nature of the labour market. As such, the different levels of protection should be accounted for when analyzing labour market effects of foreign competition in manufacturing industries. This is even more crucial particularly in the wake of the ASEAN free trade area (AFTA), as further liberalisations are expected in the trade regime.

4. Cross-Sectional Regression Analysis

4.1. Estimating Equations

It is acknowledged in the empirical literature that protection levels reflect trade policy since it captures the restrictiveness of the trade regime, and thus should not be neglected in the discussion of trade influences. In this context, measures of exposure to foreign competition are extended beyond quantity flows to capture the influence of trade policy instruments.

Since the measures of trade protection levels have to be calculated at the 9-digit SITC level prior to aggregating to the 3-digit SITC, the nature of the analysis is cross-sectional. In the spirit of Greenaway *et al*. (1999), the reduced form employment function estimated in the cross-section analysis is derived from a fairly simple static profit-maximizing model of firm behaviour. A Cobb-Douglas production function is assumed for the representative firm in industry i in period t:

$$Q_{it} = A^{\gamma} K_{it}^{\alpha} N_{it}^{\beta}$$

where

A = technological progress
Q = real output
K = capital stock
N = units of labour utilised

and α, β represent the factor share coefficients and γ allows for factors changing the efficiency of the production process.

A profit-maximising firm will employ labour and capital at such levels that the marginal revenue product of labour equals the wage[4] (w) and the marginal revenue product of capital equals the user cost (c). Thus, solving this system simultaneously to eliminate capital from the expression for firm output gives the following expression:

$$Q_{it} = A^{\gamma} [\alpha N_{it}/\beta \text{ x } w_i/c]^{\alpha} N_{it}^{\beta}$$

[4] It is assumed that the supply of labour to each industry is perfectly elastic so that wages can be considered exogenous. Hasan *et al.* (2003) claim that this assumption is plausible given that the unit of analysis is an industry-time combination, which is a much higher level of disaggregation in comparison to manufacturing or economy wide data.

Taking logarithms and rearranging the above equation provides the derivation of the firm's, and therefore the industry's derived demand for labour:

$$lnN_{it} = \mu_0 + \varphi_1 ln(w_i/c) + \varphi_2 lnQ_{it}$$

where

$$\mu_0 = -(\gamma lnA + \alpha ln\alpha - \alpha ln\beta)/(\alpha + \beta)$$
$$\varphi_1 = -\alpha/(\alpha + \beta)$$
$$\varphi_2 = 1/(\alpha + \beta)$$

Increases in industry output (Q) increase the demand for labour (N), while increases in ratio of wages to the cost of capital[5] (w/c) cause labour demand to fall. The effects of trade on employment are investigated by modifying the production function to include trade terms (exports and imports). Labour demand is assumed to depend on a technology indicator, which in turn is assumed to depend on the volume of trade. The justification of this assumption is that exposure to foreign competition induces firms to reduce x-inefficiencies in production.

If the technical efficiency of the production process increases over time and the rate of technology adoption and increases in x-efficiency are correlated with trade changes and other demand shifters such as foreign direct investment (FDI), then parameter A in the production function varies with time in the following manner:

$$A_{it} = e^{\delta 0 Ti} M_{it}^{\ \delta 1} X_{it}^{\ \delta 2} FDI_{it}^{\ \delta 3} \qquad \delta_0, \delta_1, \delta_2, \delta_3 > 0$$

where

T = time trend
M = imports
X = exports
FDI = foreign direct investment

then taking log:

$$lnA = ln[e^{\delta 0 T} M^{\delta 1} X^{\delta 2} FDI^{\delta 3}]$$
$$lnA = \delta_0 T + \delta_1 lnM + \delta_2 lnX + \delta_3 lnFDI$$

Substitute the above into the following equation :

$$lnN = \mu_0 + \varphi_1 ln(w/c) + \varphi_2 lnQ$$

implies

$$lnN_{it} = \varphi^*_0 - \mu_0 T - \mu_1 lnM_{it} - \mu_2 lnX_{it} - \mu_3 lnFDI_{it} + \varphi_1 ln(w_i/c) + \varphi_2 lnQ_{it} + \Phi Z_{it}$$

with

i = industry
t = time
$\varphi^*_0 = -(\alpha ln\alpha - \alpha ln\beta)/(\alpha + \beta)$
$\mu_0 = v\delta_0$
$\mu_1 = v\delta_1$
$\mu_2 = v\delta_2$

[5] Capital markets are assumed to be perfect and therefore the user cost of capital (c) will only vary over time.

$\mu_3 = v\delta_3$
$v = \gamma/(\alpha + \beta)$
Z = other possible influences upon employment (structural characteristics of the industry)

The above equation forms the basis of labour demand estimation in this study. Industry level trade protection is expected to have a direct effect on industry labour demand, through product demand. Thus, the partial equilibrium effects of trade policy are measured by incorporating trade policy variables as measures of the extent of protection levels across industries. The study associates employment directly to measures of trade protection without linking the latter to trade measures (import and exports). Industry imports and exports are thus deemed to capture the combined effect of all trade related channels other than trade policy as follows:

$$lnN_i = \varphi^*_0 - \mu_1 lnM_i - \mu_2 lnX_i - \mu_3 (FDI/CI)_i + \varphi_1 lnW_i + \varphi_2 lnVA_i + \Phi Z_i + \varepsilon_i \quad (1)$$

$$lnS_i = \varphi^*_0 - \mu_1 lnM_i - \mu_2 lnX_i - \mu_3 (FDI/CI)_i + \varphi_1 lnW_i + \varphi_2 lnVA_i + \Phi Z_i + \varepsilon_i \quad (2)$$

$$lnUS_i = \varphi^*_0 - \mu_1 lnM_i - \mu_2 lnX_i - \mu_3 (FDI/CI)_i + \varphi_1 lnW_i + \varphi_2 lnVA_i + \Phi Z_i + \varepsilon_i \quad (3)$$

where

N_i = total employment
S_i = skilled employment
US_i = unskilled employment
M_i = real imports
X_i = real exports
$(FDI/CI)_i$ = share of foreign direct investment in total capital investment (in per cent)
W_i = average real wage
VA_i = real value-added

Z_i represents the structure of protection across industries represented by t (average tariff rate, in per cent), Xd (average export duty, in per cent), IL (percentage of total number (import value) of products covered by import licenses) and EL (percentage of total number (export value) of products covered by export licenses) and ε represents error terms that pick up random measurement errors in employment and the effects of labour demand shocks on employment, which are not picked up by the included independent variables.

The above equation is also estimated for skilled employment (Equation 2) and unskilled employment (Equation 3) as dependent variables. All the variables in the above specifications are measured in real terms and are in logarithmic values except for the trade protection variables and FDI, which are in percentages. The stock of FDI as a ratio of total capital investment is used in the analysis as it is less prone to variation and is a preferred measure than FDI flows.

4.2 Sample Characteristics

Table 3 presents a select set of industry characteristics for the chosen years. Unlike that of the developed world, destruction of jobs is obviously not the problem in Malaysian manufacturing. Manufacturing employment has grown by more than 100 per cent between

Table 3: Select characteristics for manufacturing, 1990-2000

Characteristics		1990	1993	2000
	LABOUR DATA			
Full-Time paid employees	- % of national employment	19.94	23.55	27.50
	- Total (No.)	741598	1067358	1484247
	- Skilled (% of total)	12.51	12.99	16.87
	- Unskilled (% of total)	70.71	77.54	73.17
Average wages	- Total (RM per year)	5377	6427	8959
	- Skilled (RM per year)	15885	17436	21182
	- Unskilled (RM per year)	3908	4584	6219
	INDUSTRY DATA			
Value added (RM million)		18934	31527	62755
Foreign Direct Investment	- Total (RM million)	15145	6152	18007
	- % of Total Capital Investment	61.49	45.91	59.13
	TRADE DATA			
Imports	- % of GDP	71.89	74.77	123.50
	- Total (RM million)	43733	70131	295859
Exports	- % of GDP	99.10	110.45	201.16
	- Total (RM million)	57089	93779	352696
Average tariff rate (%)		10.76	6.81	6.32
Average export duty (%)		9.50	2.87	0.48
License coverage	- IL (%)	8.09	7.92	13.83
	- EL (%)	8.59	8.18	15.39

Source: Compiled from calculations based on labour, industry and trade data.

1990 and 2000. Since job destruction is not the issue, the interest in manufacturing lies in the changes in skills composition. There seems to be a slight shift in the composition of manufacturing labour in favour of skilled workers. Unique to the Malaysian scene, is also the relatively high employment shares of unskilled workers. Unskilled workers have been of prime importance to the manufacturing sector with the large inflow of foreign labour since the 1990s.

Foreign participation in manufacturing is not just limited to the inflow of migrant labour, but also the inflow of FDI. Though inward FDI stock as a percentage of total capital investment has declined marginally from 61 per cent in 1990 to 59 per cent in 2000, it still accounts for the majority share in total capital investment. Japanese and US investments (the major foreign investors) into Malaysia are noted to be 'vertical' in the sense that manufacturing affiliates are established in order to take advantage of cheaper factor prices. In fact, Fukao *et al.* (2003) iterates that the significant increase in vertical intra-industry trade in East Asia (including Malaysia) is attributed to inward FDI.

FDI in Malaysia is generally export-oriented. The expansion in Malaysian exports as shown in Table 3 has thus been generated largely by external demand from developed economies and market access to them facilitated by FDI (Rasiah 2002). The 1990s witnessed

a continued expansion of not just exports but also imports. It is claimed that the modern and growing sectors of manufacturing in particular are highly dependent on imported components. The increase in imports also attests to the fact that it may not be possible to put a constraint on the former through licensing (there is a weak correlation of negative 0.3 between the percentage change in imports and the changes in import licensing for the period 1990 to 2000), since imports comprise capital and intermediate goods. Therefore any dynamic changes in the export structure of these industries can be identified with changes in their import structure.

In relation to trade flows, Table 3 also reveals that the average tariff rates and export duties have reduced with time whilst quantitative restrictions in the form of import licensing (IL) and export licensing requirements (EL) have increased. Table 4 presents the summary statistics of the trade protection measures of the cross-sections considered for the empirical estimations. Based on the mean values, it is obvious that export duties were almost totally eliminated by 2000. While tariffs and export duties declined, this level of protection is substituted with quantitative restrictions. There is a rise in the mean values of import and export licensing between 1990 and 2000.

Table 4: Summary statistics of cross-sectional trade protection

Variable	Number of Observations	Mean	Standard Deviation	Minimum	Maximum
			1990		
t (%)	68	18.46	36.41	0	274.08
Xd (%)	68	0.40	2.87	0	23.62
IL (%)	68	15.82	26.77	0	100.00
EL (%)	68	10.05	24.38	0	100.00
			1993		
t (%)	70	15.81	40.20	0	333.57
Xd (%)	70	0.33	2.58	0	21.55
IL (%)	70	15.98	27.19	0	100.00
EL (%)	70	9.91	23.72	0	100.00
			2000		
t (%)	72	11.73	35.10	0	296.12
Xd (%)	72	0.14	0.83	0	6.70
IL (%)	72	17.35	24.45	0	100.00
EL (%)	72	15.85	23.82	0	95.92

Note:
t – average tariff rate
Xd – average export duty
IL – percentage of total number (import value) of products covered by import licenses
EL – percentage of total number (export value) of products covered by export licenses

The variations in the tariff rates vis-à-vis export duties across industries signify different levels of protection. It is obvious that the standard deviations for tariffs are much higher

than that for export duties. However, in terms of quantitative restrictions, the standard deviations of import licensing do not differ much from that of export licensing.

The next interesting point to observe in the Malaysian manufacturing sector regarding quantitative restrictions is that industries with high IL also have high EL. (The correlation of IL and EL is approximately 0.4 for all the three years in the sample). However industries with high licensing requirements are not highly protected in terms of tariffs or export duties. (A negative correlation is obtained between tariffs/export duties with licensing requirements). Therefore in examining trade-labour effects, a complete analysis beyond the simple trade flows to include the extent of trade protection is all-important.

4. 3 Results

This section will shed some light on the issue pertaining to the relationship between trade liberalisation and labour market outcomes. At this level of analysis, it is basically cross-sectional. Several diagnostic tests are carried out to ascertain the reliability of the results. The first is a test for heteroskedasticity, performed using two flavours of the Breusch-Pagan (1979) and Cook-Weisberg (1983) tests. The second test refers to the Ramsey (1969) regression specification error test (RESET) for omitted variables.

Table 5 presents the estimates of the labour demand function for 1990, 1993[6] and 2000 in the three panels respectively. The robust standard errors are reported for some specifications in Table 5 as the variances of the error terms are found to be not constant. Generally, there is no problem of omission of variables. The estimations for aggregate employment functions are reported in Equation (1) of Table 5 while the breakdown into skilled and unskilled employment in Equations (2) and (3) respectively.

The sign of the wage coefficient is significantly negative while that for value-added is significantly positive, as is appropriate in labour demand functions, for all specifications. The stock of FDI in total capital investment relates significantly and positively with aggregate employment. This is widely acknowledged as foreign investment in Malaysian manufacturing has generated employment opportunities. Only weak positive links between FDI and skilled labour are observed in 2000. It appears therefore that there is no bias towards skilled job gains resulting from FDI inflows. This may plausibly change in future with the recent move to encourage selective FDI inflows into higher value added activities.

Apart from the above variables, the focus of the analysis is mainly on the coefficients of the trade terms: trade flows (*M* and *X*) and trade protection levels (*t, Xd, IL, EL)*. Exports are found to generate employment gains, albeit weak. Though imports do not have any significant association with aggregate employment, there are some notable differences between the influence of imports and exports on the composition of labour demand. There is positive evidence between imports and skilled labour demand and between exports and unskilled labour. In fact, the coefficients estimates of imports in the unskilled labour demand equation remain consistently negative for all years.

[6] Given that the coefficient estimates for 1990 and 1993 are very much similar, the data for both years are pooled and estimated. However the coefficients estimates remain similar in terms of their signs and significance. (The results are not reported due to the pervasive problem of omission of variables).

Table 5: Employment equations incorporating trade protection

Independent variables	(1) Coefficient	(1) Standard Error	(2) Coefficient	(2) Standard Error	(3) Coefficient	(3) Standard Error
			1990			
W	-1.341**	0.126	-0.954**	0.190	-1.682**	0.181
VA	0.848**	0.042	0.863**	0.045	0.847**	0.056
FDI	0.0003	0.001	0.001	0.001	0.001	0.002
M	0.013	0.022	0.037	0.025	-0.004	0.030
X	0.036	0.027	0.017	0.030	0.056	0.036
t	0.001	0.001	0.0004	0.001	0.001	0.002
Xd	-0.037**	0.015	-0.025**	0.016	-0.072**	0.020
IL	0.0003	0.002	0.001	0.002	-0.002	0.002
EL	0.003	0.002	0.001	0.002	0.004*	0.002
R-squared	0.939		0.919		0.887	
Test statistics	F(3, 55) = 2.68*		F(3, 55) = 1.86		F(3, 55) = 1.70	
	$\div^2$ = 0.40		$\div^2$ = 0.54		$\div^2$ = 1.96	
			1993			
W	-1.359**	0.095	-0.846**	0.095	-1.614**	0.219
VA	0.901**	0.024	0.904**	0.026	0.897**	0.051
FDI	0.001	0.001	0.001	0.001	0.002	0.002
M	-0.002	0.020	0.052**	0.024	-0.032	0.033
X	0.032*	0.018	0.002	0.018	0.077**	0.028
t	-0.001**	0.001	-0.001**	0.0004	-0.002**	0.001
Xd	-0.034**	0.012	-0.025**	0.005	-0.088**	0.010
IL	-0.002*	0.001	-0.0005	0.002	-0.006**	0.002
EL	0.002	0.001	-0.0001	0.002	0.006**	0.002
R-squared	0.971		0.971		0.935	
Test statistics	F(3, 57) = 2.32*		F(3, 57) = 2.07		F(3, 57) = 3.09**	
	$\div^2$ = 0.21		$\div^2$ = 0.73		$\div^2$ = 3.68	
			2000			
W	-1.495**	0.103	-1.157**	0.152	-1.785**	0.325
VA	0.904**	0.028	0.887**	0.035	0.969**	0.041
FDI	-0.0004	0.001	0.002*	0.001	-0.002	0.002
M	-0.001	0.023	0.024	0.022	-0.029	0.043
X	0.039*	0.021	0.029	0.018	0.047	0.035
t	-0.001	0.001	0.001	0.0005	-0.002**	0.001
Xd	-0.243**	0.040	-0.230**	0.033	-0.274**	0.061
IL	-0.001	0.001	-0.001	0.001	-0.004**	0.002
EL	0.001	0.002	-0.0004	0.002	0.003	0.002
R-squared	0.961		0.968		0.901	
Test statistics	F(3, 59) = 0.08		F(3, 59) = 0.68		F(3, 59) = 0.07	
	$\div^2$ = 0.57		$\div^2$ = 3.62*		$\div^2$ = 6.68**	

Note: The dependent variable is total number of full-time paid employees for Equation (1) and skilled employees and unskilled employees for Equations (2) and (3) respectively.
**significant at 5 per cent and *significant at 10 per cent.
The *F*-test refers to the Ramsey (1969) regression specification error test (RESET) for omitted variables. The chi-squared refers to the Breusch-Pagan (1979) and Cook-Weisberg (1983) tests for heteroskedasticity.

In the case of Malaysia, there are reasons to believe that imports may have a stronger impact on skill levels of the labour market since imports comprise intermediate capital goods, which embody new technologies. Existing evidence for Malaysia also confirms that manufacturing imports embody a higher level of skill content than exports (Bashir, 2001). As such, there is a possibility that imports increase competition in the domestic market and forces domestic producers to innovate and increase the efficiency to compete with foreign imports. It is also argued that imports comprise high quality superior equipment, which increases growth vis-à-vis domestically produced equipment (Mazumdar 2001). It is therefore perceived with higher technical efficiency and superior imports of equipment that embody new technology; imports may generate higher demand for skills. This argument appears convincing for Malaysia, since the manufacturing sector is highly dependent on imports.

In terms of trade protection, significant negative association between tariffs and aggregate employment is observed only in 1993. Conversely, export duties appear to significantly matter more for employment than tariffs. The coefficient estimates for export duties in the aggregate employment equations are negative and significant for all years. Reduction in trade barriers has probably caused industries to expand production and increase labour demand. It appears that high tariffs and export duties in the past may have kept employment inefficiently low in manufacturing. In this perspective, trade liberalisation is deemed desirable.

A breakdown of labour demand by skills reveals that trade liberalisation in the form of reductions in tariff rates and export duties have also been favourable to both skilled and unskilled labour in terms of employment gains. The coefficient estimates for tariffs and export duties are found to be larger for unskilled labour relative to skilled labour. There is also more evidence of a negative association between tariffs and unskilled labour.

Quantitative restrictions do not matter significantly for aggregate employment. Quantitative restrictions are, however, of significant importance when labour demand is disentangled by skill levels. Licensing requirements significantly influences the demand for unskilled labour with opposing effects on the latter depending on the type of license.

Import licensing reduces the demand for unskilled labour whilst export licensing increases the demand for unskilled.[7] The positive impact of export licensing on unskilled labour demand is however limited. It appears that either the stringent requirements on imports have caused adjustments within the industry that reflect improvement in efficiency *via* the rationalisation of unskilled labour or partly because the regulations are also generally concentrated in skill intensive industries.

In total, the types of trade protection are important in that they relate differently to labour demand. The results pertaining to labour composition effects of quantitative restrictions could well be an additional channel through which skill inequality (ratio of skilled to unskilled employment) in manufacturing may have been affected in the 1990s. Some healthy skepticism should therefore accompany the notion that trade liberalisation is inextricably linked with reductions in inequality (Savvides 1998), since the type of policy instrument is important for the latter.

[7] When quantitative restrictions are measured using the value of imports (exports) that is subject to licensing requirements, the coefficient estimates for the import licensing and export licensing variables remain insignificant.

5. Conclusion

Trade protection in the form of tariffs and export duties has reduced substantially while quantitative restrictions (import and export licensing requirements) have increased in the 1990s. Empirical estimates point to lower levels of employment in industries with high tariffs and export duties. By skill levels, a significant negative relationship co-exists between tariffs and export duties with skilled and unskilled labour. This suggests that the reduction in tariffs and export duties in the 1990s have benefited workers of all skill levels.

This is not the case when non-tariff barriers are considered. Unlike that of tariff barriers, the costs of adjustments to the imposition of licensing fall disproportionately on unskilled workers. Only unskilled labour showed significant response to licensing requirements. Import licensing is negatively linked to unskilled labour. Since there is more evidence on import licensing than export licensing, the increase of the former permits in the 1990s may well have had a bearing on the rising skill inequality in manufacturing.

References

ASEAN Secretariat *(http://www.us_asean.org/afta.asp)*

Athukorala, P. and J. Menon. 1999. Outward orientation and economic development in Malaysia. *World Economy* **22(8)**: 1119-1139.

Athukorala, P. 2002. Malaysian trade policy and the 2001 WTO trade policy review. *World Economy* **25(9):** 1297-1317.

Bashir, M.S. and Z.A. Rashid. 2000. Labour skill content in manufactures: The case of Malaysia. Working Paper 4/2000, Universiti Putra Malaysia: Malaysia.

Bashir, M.S. 2001. Labour skill, trade structure and comparative advantage of Malaysia's manufacturing industries, 1978-1996. Unpublished. thesis, Universiti Putra Malaysia: Malaysia.

Breusch, T. and A. Pagan. 1979. A simple test for heteroscedasticity and random coefficient variation. *Econometrica* **47**:1287-1294.

Cook, R.D. and S. Weisberg. 1983. Diagnostics for heteroscedasticity in regression. *Biometrika* **70**:1-10.

Currie, J. and A. Harrison. 1997. Sharing the costs: The impact of trade reform on capital and labor in Morocco. *Journal of Labor Economics* **15(3)**: S44-S71.

Das, D.K. 2003. Quantifying trade barriers: Has protection declined substantially in Indian manufacturing? Working Paper No.105, Indian Council for Research on International Economic Relations: India.

Fukao, K., H. Ishido and K. Ito. 2003. Vertical intra-industry trade and foreign direct investment in East Asia. *Journal of Japanese International Economies* **17**: 468-506.

Gaston, N. 2001. The impact of international trade on Australian manufacturing employment. In *Globalization and Labour Markets*, ed. Greenaway D. and Nelson, D.R. UK: Edward Elgar.

Greenaway, D., R.C. Hine and P. Wright. 1999. An empirical assessment of the impact of trade on employment in the United Kingdom. *European Journal of Political Economy* **15**: 485-500.

Hasan, R. 2001. The impact of trade and labor market regulations on employment and wages: Evidence from developing countries. East-West Center Working Paper No.32, East-West Center: Hawaii.

Hine, R.C. and P. Wright. 1998. Trade with low-wage economies, employment and productivity in UK manufacturing. *Economic Journal* **108**: 1500-1510.

Khalifah, N.A. 1996. AFTA and intra-industry trade. *Asean Economic Bulletin* **12(3)**: 351-368.

Mazumdar, J. 2001. Imported machinery and growth in LDCs. *Journal of Development Economics* **65:** 209-224.

Menon, J. 2000. How open is Malaysia? An analysis of trade, capital and labour flows. *World Economy* **23(2)**: 235-255.

Milner, C. and P. Wright. 1998. Modelling labour market adjustment to trade liberalization in an industrialising economy. *Economic Journal* **108**: 509-528.

Rasiah, R. 2002. Manufactured exports, employment, skills and wages in Malaysia. Employment Papers 2002/35, Employment Sector, International Labour Organization: Geneva.

Ramsey, J.B. 1969. Tests for specification errors in classical linear least-squares regression analysis. *Journal of the Royal Statistical Society, Series B* **31**:350-371.

Revenga, A. 1997. Employment and wage effects of trade liberalization: The case of Mexican manufacturing. *Journal of Labor Economics* **15(3)**: 20-43.

Lang, K. 1998. The effect of trade liberalization on wages and employment: The case of New Zealand. *Journal of Labor Economics* **16(4)**: 792-814.

Savvides, A. 1998. Trade policy and income inequality: New evidence. *Economics Letters* **61**:365-372.

Wood, A. and C. Ridao-Cano. 1999. Skill, trade and international inequality. *Oxford Economic Papers* **51**: 89-119.

Appendix 1: Number of sub-industries in each major industry group

Industry	1990	1993	2000
Food	14	14	14
Beverages & Tobacco	3	3	3
Textile & Textile Products	5	6	6
Leather & Leather Products	2	2	2
Wood & Wood Products	3	3	3
Furniture & Fixtures	1	1	1
Paper, Printing & Publishing	2	2	2
Chemical & Chemical Products	6	6	6
Petroleum Products	1	1	1
Rubber Products	3	3	3
Plastic Products	1	1	1
Non-Metallic Mineral Products	1	1	1
Basic Metal Products	1	1	2
Fabricated Metal Products	5	5	5
Machinery Manufacturing	5	6	6
Electrical & Electronic Products	4	4	4
Transport Equipment	4	4	5
Scientific & Measuring Equipment	3	3	3
Miscellaneous	4	4	4
TOTAL	68	70	72