CHARACTERIZATION OF MALAYSIA-ASEAN BILATERAL TRADE FLOWS: IMPLICATIONS FOR MANUFACTURING EMPLOYMENT IN MALAYSIA

Evelyn Devadason

ABSTRACT

Commodity trade data for the Malaysia-ASEAN bilateral trade flows indicate a distinct shift in the structure of trade. The emerging pattern of trade between Malaysia and ASEAN is characterized by: increased intra-industry trade (IIT) in the 1990s; dominance of vertical IIT; and product flows of an almost equal share of quality differences. The general expansion of IIT with ASEAN is prompted by greater economic complementarities over time arising from increased internationalization.

The implications of the differences in the nature of trade for Malaysia-ASEAN vis-à-vis bilateral trade with other major trading partners (US and Japan) on the domestic labour market are examined within a dynamic labour demand framework, accounting for trade flows and trade specialization. In terms of trade flows, imports from ASEAN are found to be significantly important for both skilled and unskilled labour. Imports from ASEAN also render the largest long run impact on unskilled labour vis-à-vis the other two major import sources. In terms of trade specialization, IIT with ASEAN is also found to have a significant contemporaneous positive impact on labour demand, particularly that of skilled. In conclusion, the impact of trade flows and trade specialization with ASEAN relative to the other major trading partners reflects the typology of labour utilized if one considers the quality of products traded.

INTRODUCTION

Trade developments in East Asia point to an increase in relative importance of machinery and electronic products and a rapid expansion in international production sharing as reflected in trade in parts and components (Ng and Yeats, 2003). A potent factor promoting the expansion of intra-regional trade is the growing similarities between the regional countries. For example, the trade complementarity index between Malaysia and other East Asian countries increased more than 50 per cent from 29.9 in 1985 to 56.4 in 2001 (see Ng and Yeats, 2003).

Malaysia's trade patterns closely mirror the region's experience. The high trade exposure of Malaysian manufactures has made it increasingly more exposed to international competition and more inter-dependent with its trading partners in terms of employment linkages. According to Sakurai and Moriizumi (2000) in their study on trade-employment linkages within the Asia-Pacific region between 1985 and 1990, Malaysian employment has become quite sensitive to imports from other countries. Based on their estimations, 15 per cent of manufacturing employment engaged in exports is generated by imports from the other Asia-Pacific countries (Japan, USA, China, Korea, Taiwan, Singapore, Thailand, Indonesia and Philippines). Malaysian employment was also found to be most sensitive to imports from Singapore that is a one million US$ increase in imports had increased manufacturing employment by 0.98 and 0.82 in 1985 and 1990 respectively. Sakurai and Moriizumi (2000) therefore argue that the growing inter-dependence of employment is triggered by the international procurement of intermediate products for export production.

The study by Sakurai and Moriizumi (2000) on employment linkages however only takes into account the effects on employment, without making any links with skills. The latter is considered in Bashir's (2001) study. His study concludes that Malaysia's trade flows merely reflect her skill endowments; import dependent industries are found to have higher skill levels than export oriented industries. Conversely, Rasiah (2002) argues that the relocation of labour-intensive stages of assembly and processing by the North-East Asian economies to Malaysia, increased demand for the unskilled particularly in export oriented industries during the second phase of export-oriented industrialization from the mid-1980s. Bashir (2001) and Rasiah (2002) basically interpret the trade-skills linkages differently. The former infers that skills influence trade flows which goes back to the basis of the Hecksher-Ohlin theorem of trade based on factor endowments, while the latter suggests that trade flows may affect the demand for skills. These studies point out that trade flows have some ramifications for the Malaysian labour market.

On the question of trade flows again, the emphasis is not merely on the trade performance of the industries concerned, but also the changing structure of trade. The interdependence of economies has provided opportunities for higher intra industry trade (IIT). There is some prior evidence for Malaysia that can shed some light on this issue. IIT in manufactures appears to have grown, based on Brulhart and Thorpe (2000) and Mansor and Radam (2001). The latter study proves this for the case of Malaysian trade in manufactures with the European Union. Vertical intra-industry (VIIT) was found to be higher than horizontal intra-industry trade (HIIT). Hurley (2003) further confirms that VIIT also dominates HIIT for intra-ASEAN IIT in manufactures. This simply means that differences in relative factor endowment (or comparative advantage) are still the main driving force behind IIT in manufactures.

The above developments in the pattern and nature of international trade have given rise to concerns about the consequences for domestic employment. It is thus useful to examine whether Malaysian trade with her major trading partners impacts differentially on the derived demand for labour. Since trade flows and trade patterns may invoke different responses in the labour market, it is imperative to ascertain if trading partners matter to the latter since trade flows vary with different trading partners.

The major trading partner countries that made up approximately 57 per cent of Malaysia's trade in manufactures in 2000 are the ASEAN (Association of Southeast Asian Nations), United States of America and Japan. The study will thus compare and contrast the role played by trade with the ASEAN countries from that of trade with the US and Japan in altering employment in manufacturing. A differential impact of trade with these partner countries is also anticipated given that Malaysia is unskilled abundant relative to the US and Japan but relatively skill abundant with some of the ASEAN countries.

This paper is structured in the following manner. Section 2 discusses the data that is employed for the study. Section 3 analyzes the bilateral trade flows and the evolution of trade patterns between Malaysia-ASEAN, Malaysia-US and Malaysia-Japan. Section 4, the core section, is devoted to an empirical study based on panel data for trade and employment. Finally Section 5 concludes.

DATA

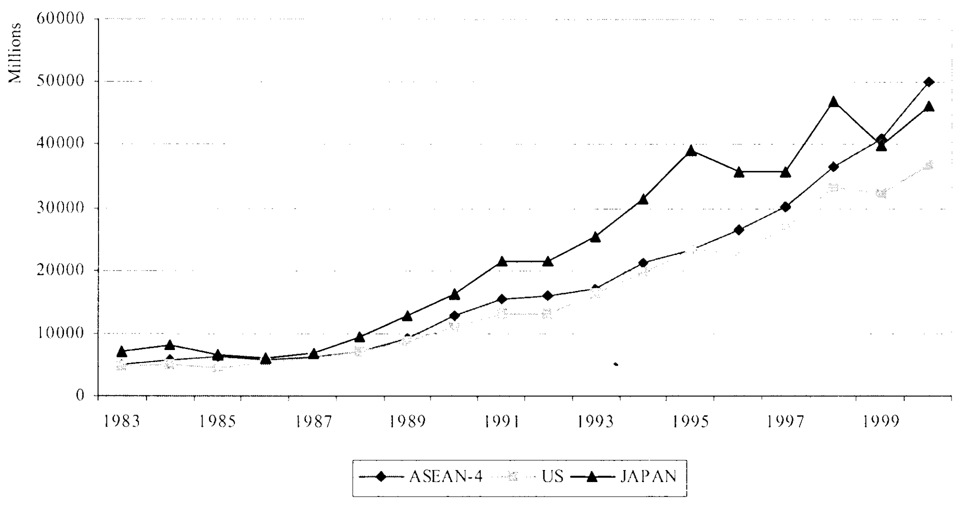
The data on exports (X) and imports (M) are derived from the *Malaysia: External Trade Statistics* publications. The data is compiled for industries at the 3-digit Standard International Trade Classification (SITC) level for the period 1983 to 2000 for 19 major manufacturing industries (Appendix 1) while detailed trade data at the 9-digit SITC is compiled for 1983 and 2000. Exports are valued f.o.b. while imports 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.

The data set on import volumes are derived for three trading areas: original ASEAN member countries (Singapore, Thailand, Philippines and Indonesia, hereafter referred to as the MASEAN), United States of America (MUS) and Japan (MJAPAN). Imports with the numerous other countries are captured as trade with the rest of the world (MROW). Imports as pointed out by Lovely and Richardson (1998) may take the following form: (a) finished goods that displace domestic production directly; (b) outsourcing, defined as the import of components or assembly by firms who previously may have produced these inputs internally.

Though employment may be affected by both exports and imports, only the latter is usually disaggregated into trade by origin. This is because the effects of an increase in exports to low-wage countries are supposed to have both a negative aspect of the fall out of increased competition in export destinations and the positive effect of increasing production. Both effects do not manifest into a clear-cut relationship. However in the Malaysian case, there is evidence of a high dependency of exports on imported capital and intermediate goods. As such, exports will also be disaggregated by market destinations (denoted as XASEAN, XUS, XJAPAN and XROW), and both exports and imports are taken to represent shocks to the demand for labour in this study.

The choice of the three trading partners is based on the fact that imports from and exports to these countries have been steadily rising with time as shown in Figures 1 and 2 respectively. Based on Figure 1, the average annual growth rate of real imports from ASEAN between 1983 and 2000 is 15 per cent, and 13 per cent each for imports from the US and Japan. In addition to the rise in growth rates, all three countries are of equal importance in terms of their share of imports in total Malaysian imports. In 1983, Japan accounted for 22 per cent of total manufacturing imports followed by ASEAN and the US, with 16 and 15 per cent of total imports respectively. In 2000, ASEAN increased its share to 22 per cent, followed by Japan (21 per cent) and the US (16 per cent). The three trading partners thus represent a fairly balanced group with almost similar growth rates in imports and shares in total imports.

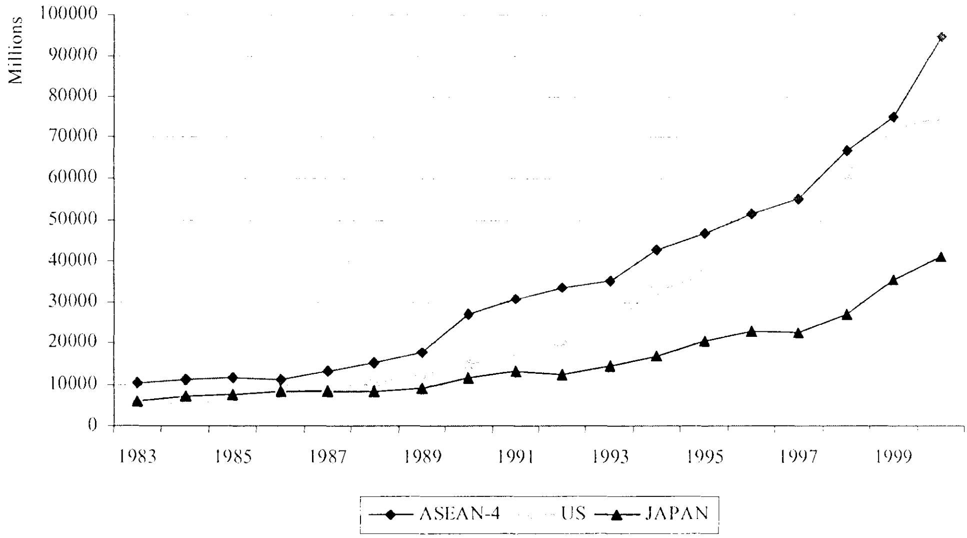
Figure 1: Imports from Major Trading Partner



Source: Calculated from *Malaysia: External Trade Statistics*, various years.

Similarly, the average annual growth rate of real exports to ASEAN, US and Japan between 1983 and 2000 is 14 per cent, 18 per cent and 12 per cent respectively (see Figure 2). As that for imports, all three countries account for a substantial export share of manufacturing exports. The ASEAN and Japan accounted for 29 per cent and 17 per cent of total manufacturing exports in 1983 respectively. Both export market shares see a decline in 2000 to 26 per cent and 11 per cent for the ASEAN and Japan respectively. Conversely there is an increase from 14 per cent to 21 per cent in the export market share in the case of the US. Nevertheless, the combined export market share of the three trading partners is approximately 58 per cent in 2000.

Figure 2: Exports to Major Trading Partners



Source: Calculated from *Malaysia: External Trade Statistics*, various years.

It should be noted that the aim of the study is not to investigate the differential impact of trade with different *income groups* of trading partners, but the differential impact of trade with *key* trading partners. Nevertheless, it is worth mentioning that Japan and the US are basically high income countries while the ASEAN (with the exception of Singapore) are grouped as lower income countries based on the World Bank classification.

Based on aggregate trade flows, the Grubel-Lloyd (GL, 1975) index is employed to measure the extent of trade overlap in manufacturing industries over the period 1983 to 2000. The GL index is also calculated to identify the characteristics of bilateral trade flows with the countries considered. The GL index, calculated for aggregate trade flows with the above trading countries, is defined as:

$$GL_{ij} = 1-[\,|X_{ij}-M_{ij}|\,/\,(X_{ij}+M_{ij})]*100$$

Where

i and j represent the industry and country respectively.

The *nature* of IIT for Malaysian manufactures cannot be calculated at the 3-digit SITC level of aggregation as the quantity measure varies with different products. Thus trade flows with the three trading areas are examined at the 9-digit SITC level of aggregation only for the sample years 1983 and 2000. First, the GL index is calculated at the 9-digit to uncover the traded products that are IIT in nature. (Appendix 1 reports the number of traded products considered for calculation of IIT within the 19 major industries). In what follows, the GL coefficients of more than 50 per cent are treated as a cut-off point to represent IIT products. Second, since products differ in quality even at the most detailed level of disaggregation, it is assumed that differences in prices (unit values) at the 9-digit level reflect quality differences. Unit values are thus calculated for the IIT products with each trading partner for the two sample years to distinguish that which is vertical (VIIT) and horizontal (HIIT).

Products whose unit values are close are considered to be differentiated horizontally. The criterion adopted is that if the export and import unit values differ by more than 15 per cent, products are considered to be differentiated vertically (see Greenaway *et al.* 1995). Thus HIIT is defined as the simultaneous exports and imports of a 9-digit SITC product where the unit value of exports (UV^X) relative to the unit value of imports (UV^M) is within a range of ± 15 per cent (limited differences in unit values), 0.85 d" (UV^X/UV^M) d" 1.15. VIIT therefore refers to the relative unit value of exports and imports outside this range (large differences in unit values), (UV^X/UV^M) < 0.85 or (UV^X/UV^M) > 1.15. Within the IIT products that are vertical in nature, high quality (HQVIIT) and low quality products (LQVIIT) are further differentiated.

Labour data (employment and wages) is drawn from manufacturing surveys (based on the Malaysia Industrial Classification, MIC) conducted annually by the Department of Statistics (DOS) Malaysia. The study will only consider full-time paid employees (N), which excludes working proprietors and active business partners, unpaid family workers and part-time paid employees. Similarly, only the wages and salaries of full-time employees are considered for the study. The wage variable (W) refers to the average yearly earnings per full-time employee in each industry. All wage variables are deflated by the Malaysian consumer price index (at constant 1980 prices).

The definition of skills used for the study is solely based on occupational groupings governed by the availability of data from the manufacturing surveys. Skilled workers refer to the number of employees in the managerial, professional, technical and supervisory categories. Unskilled workers comprise 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 real value-added (VA) and the share of foreign direct investment in total capital investment (FDI/CI).

Integrating trade, labour market and industrial statistics, the empirical analysis involves a panel data set of 19 major industrial groups, spanning the period 1983 to 2000. The data is a balanced panel of 342 observations. This data set is informative in that it includes all manufacturing industries, excluding only the non-tradeables. Thus the unit of observation in the data is industry.

TRADE PATTERNS BY MAJOR TRADING PARTNERS

The importance of Malaysia's major trading partners is presented in Table 1. Between 1983 and 2000, trade (at the 9-digit SITC[1]) with ASEAN remained relatively stable at 23 per cent of total trade in manufactures. This is not surprising since intra-regional trade had also not changed much between 1992 and 2002, accounting for approximately 25 per cent of total ASEAN foreign trade (Doan, 2003). In fact it has been cited that the low level of intra-regional trade may be due to the high similarities[2] in the export structure of ASEAN countries.

Though the growth in trade flows is marginal, the ASEAN represents a substantial proportion of total Malaysian trade. In fact, as observed earlier the ASEAN is the most important import and export market for Malaysia. Total trade with the US grew from 15 to 18 per cent between 1983 and 2000, while trade with Japan fell from 20 per cent to 15 per cent over the same period, resulting in US emerging as the second most important trading partner after ASEAN.

Table 1: Sectoral Composition of Malaysia's Trade* with Major Trading Partners

	ASEAN		US		JAPAN	
Industry	1983	2000	1983	2000	1983	2000
Food	13.19	3.77	7.31	1.49	3.57	1.18
Beverages & Tobacco	0.27	0.57	0.62	0.22	0.01	0.04
Textile & Textile Products	1.60	1.34	6.70	1.47	1.96	1.30
Leather & Leather Products	0.03	0.11	0.04	0.01	0.00	0.00
Wood & Wood Products	4.23	1.10	0.86	0.86	14.67	4.02
Furniture & Fixtures	0.10	0.44	0.07	1.46	0.06	1.11
Paper, Printing & Publishing	0.33	1.30	0.62	0.52	1.02	0.72
Chemical & Chemical Products	2.00	3.66	4.83	2.86	2.42	3.39
Petroleum Products	52.02	9.79	2.04	1.45	14.55	2.79
Rubber Products	5.13	1.03	4.41	0.42	2.57	0.65
Plastic Products	0.61	2.15	1.63	0.75	1.06	2.51
Non-Metallic Mineral Products	0.75	0.37	0.10	0.08	0.73	0.35
Basic Metal Products	1.08	2.29	0.70	0.66	12.20	5.63
Fabricated Metal Products	0.95	1.59	0.78	0.73	2.63	1.86
Machinery Manufacturing	3.35	19.75	10.10	27.60	13.78	21.32
Electrical & Electronic Products	11.12	45.65	54.19	51.50	12.86	41.87
Transport Equipment	1.97	1.19	2.00	1.38	13.32	4.95
Scientific & Measuring Equipment	0.30	1.52	1.73	4.63	1.85	2.93
Miscellaneous	0.97	2.38	1.28	1.93	1.14	2.41
TOTAL**	**23.02**	**23.52**	**15.00**	**18.03**	**20.48**	**15.08**

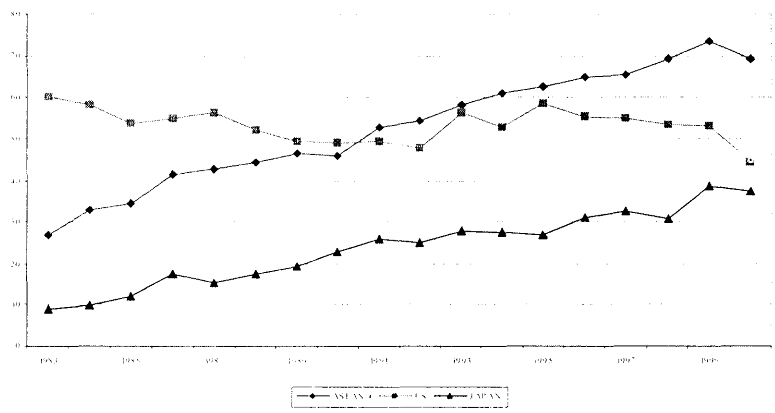
Note: * Percentage of trade with the particular group/country.
** Percentage of total trade in manufactures.
Source: Calculated from *Malaysia: External Trade Statistics*, various years.

Several aspects of the trade data display by sector as reported in Table 1 are noteworthy. Trade flows with the three trading partners in different industries reflect the dominance of trade in electrical and electronic products, followed by machinery manufacturing. By 2000, more than 60 per cent of total trade with the major trading partners was made up of these 2 product categories.

However it should be noted that the situation was quite different for the ASEAN and Japan in the 1980s. Trade shares of petroleum products and food (besides electrical and electronics) were relatively high in trade with the ASEAN in 1983 while trade with Japan reflected high shares in wood, petroleum, basic metal and transport apart from electrical and electronics and machinery. Thus, while the sectoral composition of trade flows with the ASEAN and Japan has changed over the years, it has remained fairly stable for the US.

Trade shares, as discussed above, reveal little about the specialization of trade in the bilateral trade flow context. Thus, it is useful to identify the patterns of IIT as presented in Figure 3. It is obvious that though the share of Malaysian-ASEAN trade flows in total trade in manufactures has not changed much over the years; IIT has grown remarkably from 27 per cent of total trade to 69 per cent between 1983 and 2000. IIT with ASEAN only surpassed the 50 per cent benchmark in 1991, indicating the predominance of inter-industry trade in the 1980s. The increase in IIT may be attributed to the increasing reliance on intra-regional production networks where parts, components and other intermediate goods are produced across the ASEAN region and brought together in one location for final assembly (Elliott and Ikemoto, 2004). This type of imports is basically outsourcing which results in high trade activity within the same industry.

Figure 3: Aggregate Grubel-Lloyd Index by Country, 1983-2000



Note: AGL indices (in percentages) calculated based on 3-digit level of aggregation.
Source: Calculated from *Malaysia: External Trade Statistics*, various years.

IIT with the US has however declined by 27 per cent from a high 60 per cent in 1983 to 44 per cent in 2000. It is important to note however that for the entire period of 1983-1999, trade with the US has basically been that of IIT. Conversely, one way (inter-industry) trade characterizes trade with Japan for the entire period of study and by 2000, only 33 per cent of total trade with Japan was IIT.

To capture the extent of IIT across industries, the GL indices are calculated at the 3-digit SITC level. Table 2 presents the GL indices for the 19 major industry groups. The industries show a great deal of variation in the importance of IIT. IIT fell in some industries, rose in others and shows no discernible pattern in many others. It is important to note the extent of IIT in the two major traded products between Malaysia and the three countries, which is electrical and electronics and machinery manufacturing. More than 50 per cent of trade in these two product categories with ASEAN was IIT in 2000. However, only trade with US in electrical and electronics was IIT while trade with Japan in both electrical and electronics and machinery is basically inter-industry trade. Despite the similarity in trade flows in terms of the type of products traded between Malaysia and her major trading countries (as discussed earlier based on Table 1), the structure of trade flows (as reported in Table 2) differ.

Table 2: IIT Indices by Industry

	ASEAN-4		US		JAPAN	
Industry	1983	2000	1983	2000	1983	2000
Food	23.69	53.33	4.35	9.05	7.73	10.97
Beverages & Tobacco	56.81	14.39	0.02	10.21	0.02	59.41
Textile & Textile Products	76.42	61.94	5.60	2.83	19.63	22.15
Leather & Leather Products	39.30	42.75	8.72	18.27	24.08	78.77
Wood & Wood Products	15.34	47.23	0.96	25.84	0.17	1.22
Furniture & Fixtures	93.32	20.26	87.16	2.67	4.66	14.54
Paper, Printing & Publishing	66.76	45.15	0.34	42.70	0.54	13.78
Chemical & Chemical Products	62.45	71.58	21.83	39.26	13.18	45.31
Petroleum Products	10.22	47.46	0.00	8.26	0.61	4.96
Rubber Products	13.26	29.68	2.62	21.79	9.73	36.87
Plastic Products	71.45	73.86	26.49	47.12	0.18	45.07
Non-Metallic Mineral Products	28.71	55.53	50.15	81.95	1.70	43.52
Basic Metal Products	66.09	67.30	44.92	61.80	0.62	13.56
Fabricated Metal Products	79.30	76.28	27.00	63.23	1.72	25.08
Machinery Manufacturing	52.37	56.83	7.29	22.20	2.45	30.54
Electrical & Electronic Products	75.72	84.18	93.31	56.39	33.89	44.37
Transport Equipment	51.83	51.85	51.70	22.74	0.31	2.85
Scientific & Measuring Equipment	66.39	71.37	24.56	40.63	17.07	62.52
Miscellaneous	76.55	70.31	34.08	50.98	16.35	52.59
TOTAL	**26.98**	**69.32**	**60.11**	**44.28**	**6.63**	**33.49**

Source: Calculated from *Malaysia: External Trade Statistics*, various years.

A further breakdown of IIT into its vertical (VIIT) and horizontal (HIIT) components is thus imperative after noting the substantial change in trade specialization, particularly with ASEAN, and to a large extent the US. The results in Table 3 suggest that VIIT is a significant phenomenon in the Malaysian-ASEAN trade. Based on the proportion of VIIT in IIT, about two-thirds of total IIT was vertical in 1983. By 2000, 86 per cent of the total number of IIT products was vertically differentiated.

Table 3: Nature of IIT with Major Trading Partners

1983					
	% of total IIT			% of total VIIT	
Country	IIT*	VIIT	HIIT	HQVIIT	LQVIIT
ASEAN-4	24.62	63.02	36.98	51.84	50.09
US	4.13	47.66	52.34	59.02	40.98
JAPAN	2.12	61.64	38.36	57.78	42.22
2000					
	% of total IIT			% of total VIIT	
Country	IIT*	VIIT	HIIT	HQVIIT	LQVIIT
ASEAN-4	25.00	85.95	14.05	47.39	52.61
US	9.91	92.21	7.79	35.92	64.08
JAPAN	7.60	89.89	10.11	35.21	64.79

Note: * Represents the percentage of products in manufacturing that are of IIT (GL > 50%). IIT indices are calculated at the 9-digit SITC.

Source: Calculated from *Malaysia: External Trade Statistics*, various years.

The dominance of vertical trade over horizontal trade shifts the focus to quality differentiation. Table 3 also shows that slightly more than half of Malaysian VIIT with ASEAN took the form of high quality VIIT (HQVIIT), particularly in 1983. This means that the export unit value was generally higher than the import unit value, implying that Malaysia exports costlier varieties of a product to ASEAN, from which it imports cheaper varieties of the same product. However in 2000, there was a slight deterioration in the quality of products traded between Malaysia and ASEAN. Approximately 53 per cent of trade in vertically differentiated products was that of low quality, implying a higher quality of imports. One probable explanation could be that Malaysia, to a certain extent does face some competition with the other ASEAN member countries since their export structures are considerably similar.

Though IIT was found to be not that important for Malaysia-US trade and even less so for Malaysia-Japan trade, it is useful to compare the nature of IIT with these countries with that of ASEAN. (From Table 3 it is shown that IIT products only make up 10 per cent and 8 per cent of the total number of products traded with the US and Japan in 2000 respectively). For trade with the US, VIIT is found to be much more important as by 2000, more than 90 per cent of IIT products was vertically differentiated. More importantly is that trade with the US takes the form of LQVIIT. The nature of trade flows with Japan provides a similar story as that with the US. Table 3 shows that VIIT dominates IIT flows, particularly LQVIIT when trade with Japan is considered.

IMPACT OF TRADE ON EMPLOYMENT

Theoretical Arguments

One of the most important theories of international trade for understanding the links between trade and employment is provided by the Hecksher-Ohlin-Samuelson (HOS) model, based on differing factor endowments across countries. Trade liberalization is expected to cause the import sector to contract whilst the export sector expands. Trade in this case will trigger labour reallocation from the importable to the exportable sector. The HOS theorem though provides an explanation for linkages between trade and employment is not convincing since it is founded on some very restrictive assumptions. It assumes that labour markets clear, that is wages fully adjust to restore full employment. This means that the effects of international trade on labour are entirely reflected by wage adjustments at constant employment. This assumption is unreasonable in the context of the practical functioning of labour markets, such as the presence of labour market institutions, trade unions, sticky wages and cultural factors.

Since the HOS was found to be inadequate in explaining the effects of trade on employment in developing countries, a sticky wage model is presented to explain the alternative when wages are fixed or rigid and employment shifts instead to adjust to international competition. This could be the case for developing countries, which may be characterized by an unlimited supply of workers at prevailing wages in the tradable sector. Rightward shifts of the demand for labour in response to trade would probably result in higher employment instead of higher wages.

The employment effects associated with trade liberalization in developing countries have often been interpreted in the light of a "specific factors" trade model. The specific factors models (for example Neary, 1978) that typically allow for sector specific fixed capital in the short-run addresses some of the issues that have been neglected in the neoclassical framework. Edwards (1988) examines labour market adjustments in the short and long runs, with and without wage rigidities in a homogenous labour model with fixed labour supply.

For the ideal case of no wage rigidities, the following are the findings of the Edwards model. In the short run, employment increases in the exportable sector but wages fall due to an increase in supply and a decrease in the marginal product of labour resulting from fixed capital. As expected, employment and wages fall in the importable sector. The long run impact is similar to that of the neoclassical in that employment and wages increase in the exportable sector. In contrast, though employment decreases in the importable sector, wages increase in response to a decrease in labour supply, as labour moves to the exportable sector. The net employment effect may be either positive or negative depending on which sector outweighs the other.

With wage rigidities in the form of a minimum wage in the importable (covered) sector, the employment and wage outcomes in the exportable sector in the short run is identical to the case of no wage rigidities. Employment also falls in the importable sector in the short run but wages rise due to the wage rigidity. In the long run though employment will clearly rise in the exportable sector, the change in wages is ambiguous. The ambiguity stems from two opposing effects: the movement of capital from the importable sector which increases wages and the increased labour supply from the binding minimum wage in the importable sector which decreases wages. The employment and wage impacts in the importable sector in the long run is however similar to the long run case of no wage rigidities.

Milner and Wright (1998) point out that the Edwards-type model, though typical of many developing countries, also fails to explain the presence of non-homogeneity of sectors and factors, and the fact that trade liberalization may induce competitive and efficiency effects in product markets, which in turn affects employment. Fixed factor supplies are also not reasonable in the context of unemployed labour, non-participating labour or even foreign migrants, which increases the elasticity of labour supply and hence the magnitude and direction of employment and wage responses.

In spite of the theoretical models that have accounted for employment adjustments in the presence of different labour types, wage rigidity and impacts in the short and long runs, they still fall short of explaining the dynamics of international trade on labour. There is mixed evidence regarding the impact of trade liberalization on employment in developing countries. Available evidence shows that during and after most of the trade liberalization episodes, there was no major contraction in manufacturing employment. This is because the expanding labour force in the developing world may have influenced the results to be otherwise. Similarly positive employment effects in import competing industries are reported in a number of developing countries. The findings on trade effects[3] obviously do not fit easily into the predicted theoretical framework of traditional theories and theories preceding that.

The lively debate continues as research explores further other dimensions that will expand our understanding of trade and labour markets. Some are crucial features of the real world, which the models in their standard form abstract away from. In view of this, several other explanations have been expressed as potential channels through which international trade affects the position of demand for labour.

The issue that has received recent amount of attention is trade in goods that belong to the same sector, IIT. This type of trade is not considered for in the HOS theory. The assumptions of the models explaining IIT are that consumers love variety and there are increasing returns to scale in the production of the differentiated good. Greenaway *et al.* (1999) point out that trade-labour links becomes even more complicated when expansions and contractions occur within industries. The original impression seemed to be that IIT does not affect the relative demand for skilled labour. However recent contributions to trade literature have showed that this type of trade can lead to increased inequality within countries and within sectors. The reasons put forth are: Assuming skilled workers determine the quality of goods produced and that the opportunities for greater trade rests with industries that are basically producing high quality products (differentiated in a vertical and horizontal way), the demand for high skilled labour would increase much faster (see Manasse and Turrini, 1999). Second, to employ advanced technology to produce high quality goods, the pool of high skilled workers will have to increase (see Duranton, 1999).

Some of the recent explanations on trade and labour market links depart away from the initial focus on trade flows to trade structure, particularly the arguments based on the effects of intra- and inter-industry trade. Trade can be perceived as a cause for adjustment pressures since the latter reflects endogenous changes in factors such as endowments, consumer preferences, technologies, income levels and trade policies. These factors are alluded to as "trade-induced changes," which represent the indirect effects of trade patterns. The adjustment pressure of trade and trade-induced changes on the labour market may therefore translate into a combination of changes in employment and skills, with the precise magnitudes depending on conditions in the labour market.

Estimating Equations

The empirical analysis to uncover trade flow links with labour is rooted in a partial equilibrium framework. The analysis is conducted within the framework of a fairly simple profit-maximizing model of firm behaviour (based upon Greenaway *et al.*, 1999). The influence of foreign competition *via* the changes in trade on the demand for labour is investigated directly by including trade terms (exports and imports) in the employment equation. Labour demand is assumed to depend on a technology indicator, which in turn is assumed to depend on the volume of trade. The rationale for these terms is that an increase in the openness of the industry may induce "efficiency" effects in the case of labour demand. This method also allows for disaggregating the disciplining effects of trade with various trading partners.

Greenaway *et al.* (1999) consider the dynamics of the employment equation. The dynamic relationships, characterized by the presence of a lagged dependent variable among the regressors, are considered to examine the path of employment as the labour market moves between old and new equilibria in response to trade. This is due to the existence of adjustment costs of changing employment. Generally, the important aspect related to dynamics concerns the interpretation of the long run and short run effects. The employment equation is differenced to transform out the industry specific fixed effects, and the dynamic equation estimated is as follows:

$$\Delta \ln N_{it} = -\mu_0 - \Sigma\mu_{1j}\,\Delta \ln M_{i,t-j} - \Sigma\mu_{2j}\,\Delta \ln X_{i,t-j} + \Sigma\mu_{3j}\,\Delta(FDI/CI)_{i,t-j} + \Sigma\varphi_{0j}\,\Delta \ln N_{i,t-j} + \Sigma\varphi_{1j}\,\Delta \ln W_{i,t-j} + \Sigma\varphi_{2j}\,\Delta \ln VA_{i,t-j} + \Delta\varepsilon_{it}$$

where

N_{it} = total employment in industry i in time t
M_{it} = real imports in industry i in time t
X_{it} = real exports in industry i in time t
$(FDI/CI)_{it}$ = share of foreign direct investment in total capital investment (%) for industry
i in time t
W_{it} = average real wage in industry i in time t
VA_{it} = real value-added in industry i in time t
ε represents error term that picks 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.

Greenaway *et al.* (1999) disaggregate import data in the above equations based on region of origin to examine the differential impact on labour demand. It is conceived theoretically that an increase in imports from a skilled abundant country will substitute skilled intensive activities domestically. This will thus be viewed as a negative shock to the demand for skilled labour. Increased imports from a skilled abundant country thus imply a shift toward less skilled intensive activities. The above arguments are based on trade between countries with different factor endowments (skills) and based on inter-industry trade.

The above arguments may be used in the Malaysia-Japan one-way (inter-industry) trade since Japan is relatively more skill endowed than Malaysia. However, the picture seems less clear when trade with the US is considered even though the US is relatively more skill endowed than Malaysia. At a very disaggregated trade level, it has been shown in Figure 3 that Malaysia-US trade flows predominantly comprises IIT and IIT is a typology of trade that is not accounted for in the traditional trade theory, which is based on the premises of inter and not intra industry trade.

At the other extreme, in the context of Malaysia-ASEAN trade flows, more inconsistencies with the HOS theorem exist. First, Malaysia-ASEAN trade flows cannot be categorized as trade with a particular income group since only three of the four countries considered (with the exception of Singapore) are lower income countries. In addition to this, trade with ASEAN is predominantly that of IIT in the 1990s. Within the IIT range, there is also the question of product differentiation based on quality. Most of the products traded with ASEAN comprise a combination of both high and low quality products (approximately 50:50 based on the 1983 and 2000 data in Table 3) while trade flows with the US involve almost low quality products only (based on 2000 data in Table 3).

The structure of trade flows and the nature of IIT therefore becomes an important factor pertaining to trade for labour market analysis, which may no longer be supported by the HOS arguments. A starting point to account for trade of differentiated products (either based on quality or attributes) is to establish a link between the type of products traded and the demand for workers. If the positive relationship between the quality of products and skill of workers necessary for their production holds, lower quality goods should be associated with low skilled workers, and *vice versa* for high quality goods.

Based on the differences in the nature of trade for Malaysia-ASEAN and with the other two countries, one would expect a differential impact on different category of workers resulting from both trade flows. It is expected at the very least that Malaysia-ASEAN and Malaysia-Japan would have opposite implications for the domestic labour market as the structure of trade flows are completely different. Malaysia-US trade flows may also provide a very good case to compare with Malaysia-ASEAN trade flows if the nature of IIT (product quality) is taken into account.

The above equation is thus modified for the study in several ways. First, besides accounting for imports sources, exports are also disaggregated by market destinations since exports rely on imports of capital and intermediate goods. Second, the objective is not confined just to examine trade flows *per se*, but to analyze the influence of the changing trade structure on labour. The latter forms the key building block of this study; the rationale is that if trade matters for labour then the structure of trade should be of no less importance. Thus the trade terms (M and X) in the employment equations are used interchangeably with the GL index[4]. The former as explained above captures foreign competition while the latter probes the structure of trade, basically the extent of IIT. Third, in the context of examining trade and trade structure links with employment, the aggregate employment equation is examined for different labour types. The analysis will distinguish skilled from unskilled due to the high polarization of unskilled labour in Malaysian manufacturing. This disaggregation will capture the links between trade and trade structure and the changing demand for different types of labour.

Results

Since the differencing induces a bias in the coefficient on the lagged dependent variable because of the correlation between it and the unobserved fixed effects in the residual, an instrumental variable approach is adopted. The method used is the generalized method of moments (GMM) technique of Arellano and Bond (1991), which uses lags of the endogenous variables dated t-2 and earlier as instruments since external instruments are difficult to find.

Appendix 2 presents the GMM estimates of the dynamic employment equations. Equation (1) reports the estimations for aggregate labour demand, while equations (2) and (3) are that for skilled and unskilled labour respectively. The results of the one-step model are reported though the null hypothesis of no first-order correlation in the difference residuals is rejected for all specifications, since Arellano and Bond (1991) recommend the one-step results instead of the two-step standard errors for inference on coefficients. The one step results are found to be free of second order autocorrelation for all specifications.

The signs of the wage coefficients are significantly negative while that for value-added are positive, as is appropriate in labour demand functions, for all specifications (refer to Appendix 2). The discussion below will focus on the coefficients of the trade variables. Table 4 presents the summarized short run and long run impact of trade flows by major import sources and export destinations on aggregate labour (1), skilled labour (2) and unskilled labour (3).

Table 4: Estimated Short Run and Long Run Impact of Trade Flows

	Short Run			Long Run		
Trade Variable	(1)	(2)	(3)	(1)	(2)	(3)
(XASEAN)t	-0.019	-0.006	0.096	-0.040	0.022	0.048
(XUS)t	-0.007	0.002	-0.053*	-0.001	-0.010	-0.056
(XJAPAN)t	0.018	0.027	0.045	0.050	0.066	0.065
(XROW)t	-0.022	-0.050*	0.018	-0.095	-0.093	0.022
(MASEAN)t	0.042*	0.059*	0.105*	0.078	0.145	0.160
(MUS)t	0.029**	0.033**	0.015	0.059	0.040	-0.002
(MJAPAN)t	0.057*	0.055**	0.121*	0.121	0.159	0.081
(MROW)t	0.050*	0.049**	0.095*	0.121	0.121	0.163

Note: * significant at 5% and ** significant at 10%.
Source: Estimations based on Appendix 2.

Based on Table 4, it can be inferred that Malaysia's commercial relations with ASEAN, the US and Japan do not appear to cause job losses in the presence of increasing imports. The current variable of imports from all three trading partners (MASEAN, MUS and MJAPAN) is positive and significant. The long run impact of imports also exerts a positive impact on employment in most cases and is found to be generally greater than that in the short run.

Export destinations do not significantly matter for aggregate employment growth. However exports to all destinations, with the exception of that to Japan, have a negative influence on employment growth. The signs on the export coefficients for the long run remain the same. Export expansions to Japan seem to be beneficial for employment growth.

Since trade flows with Malaysia's trading partners also differs in terms of quality, the employment equations are further disaggregated into skilled and unskilled employment. Columns (2) and (3) in Table 4 present the impact of trade flows on skilled employment and unskilled employment respectively.

Imports from ASEAN have a contemporaneous positive and significant effect on both the demand for skilled and unskilled labour. Though the import sources from the other destinations also have positive effects on skilled labour in the short run, the evidence is rather weak. Interestingly, unskilled workers gain significantly from the inflow of goods from Japan in the short run, but not from the US.

Again, evidence on export destinations for the demand for skilled and unskilled labour remains limited based on Table 4. Contemporaneous exports to the rest of the world and to the US have a negative impact on skilled and unskilled labour respectively. It is worth noting that contemporaneous exports to Japan have a positive impact on both skilled and unskilled, though insignificant.

Before drawing any implications, it would thus be useful to further investigate the differential impact of trading partners on skilled and unskilled labour in the long run. The long run estimates for import sources on skilled labour remain positive as in the case of the short run. The long run coefficient estimate of MJAPAN in the skilled employment function is found to be the largest, followed by that from the ASEAN and the rest of the world. As for unskilled functions, all imports sources have a long run positive impact with the exception for imports from the US, with largest estimates obtained for imports from the rest of the world, followed by that from the ASEAN.

In terms of exports, the long run estimates in Table 4 are found to be much smaller than the long run estimates for import sources, except for exports to the US. Exports to the US have a negative impact on both skilled and unskilled labour demand in the long run. Conversely exports to the ASEAN and Japan exert a positive impact on skilled and unskilled labour demand in the long run, with larger estimates obtained for the latter.

The deductive reasoning for the above short run and long run impact can be made if one reverts to the type of intra-industry trade characterizing Malaysia's relations with ASEAN as discussed in the previous section. The relatively high short run and long run impact of trade with ASEAN on both skilled and unskilled labour demand is as expected since trade flows with the former involves a mix of both high and low valued imports relative to exports (as noted earlier in Table 3).

Imports from and exports to Japan render the largest long run impact on skilled employment vis-à-vis that from ASEAN and the US. It has been pointed out that trade with Japan is typically that of inter-industry trade, and within the limited range of IIT products, imports are relatively that which is of higher value than the corresponding exports (based on Table 3). Therefore, one would expect imports from Japan to displace skilled labour, if not in the short run at least in the long run. A possible explanation for the positive association could be that a substantial portion of imports from Japan is related to Japanese MNCs in Malaysia sourcing their machinery and intermediate inputs from their parent/associate companies in Japan. It may also be that within the lower quality ladder of products traded with Japan, Malaysia utilizes skilled workers, as the skills in Malaysia is not equivalent to the skills in the latter.

Generally, the results on employment functions do not point to a distributional conflict expected from the differential impact of imports with the key trading partners of Malaysia. The evidence instead indicates that both skilled and unskilled workers gained in the short and long run, irrespective of the import sources. However a distributional conflict is evident for exports to different markets since gains are not accrued to both skilled and unskilled labour, except for exports to Japan.

The analysis on the impact of trade flows is extended to trade specialization with the major trading partners to gauge the differential impact of IIT on employment (see Lovely and Richardson, 1998). Trade specialization, the degree or extent of intra-industry trade with the major trading partners captured by the GL index, will provide a better understanding on the relationship between trade-labour links since the type and quality of intra-industry trade has been assessed for the given years in Tables 3.

Appendix 3 presents the results incorporating trade specialization into the employment functions. Only equation (2) in Appendix 3, skilled employment function is found to be free of second order serial correlation. In the presence of significant second order serial correlation for aggregate employment and unskilled employment functions (equations (1) and (3) respectively), the lag length is increased from 2 to 3.

Table 5 presents the estimated short run and long run impact of IIT with the major trading partners on aggregate labour, skilled labour and unskilled labour in columns (1), (2) and (3) respectively. Based on Table 5, only contemporaneous IIT with ASEAN has a positive impact on aggregate labour, and on skilled and unskilled labour. However the evidence for unskilled labour is significant only at the 10 per cent level. There is significant positive impact of lagged IIT with Japan on aggregate labour and unskilled labour (refer to Appendix 3). It is thus of concern to compare the short run and long run impact of IIT with the major trading partners.

IIT with ASEAN is consistently positive for labour demand, both skilled and unskilled in the long run. Though IIT with the US has a positive impact on skilled labour in the long run, IIT with Japan has a negative impact on the former.

Two preliminary conclusions emerge. First, the quality of traded products and the quality of labour utilized are reflected in bilateral flows with ASEAN. Second, the results on the GL indices of IIT with different trading partners do suggest some distributional conflict since only IIT with ASEAN is positively associated with both skilled and unskilled labour.

Table 5: Estimated Short Run and Long Run Impact of Trade Specialization

Trade Variable	Short Run (1)	(2)	(3)	Long Run (1)	(2)	(3)
(GLASEAN)t	0.001*	0.002*	0.001**	0.002	0.004	0.003
(GLUS)t	neg.	neg.	-0.001	0.002	0.002	neg.
(GLJAPAN)t	neg.	-0.001	neg.	0.001	-0.001	0.003
(GLROW)t	neg.	neg.	0.001	-0.003	-0.001	neg.

Note: neg. - negligible
  * significant at 5% and ** significant at 10%.

Source: Estimations based on Appendix 3.

CONCLUSION

Trade flows and trade structure with Malaysia's three major trading partners reveal the following features. First, trade with the US mainly followed a pattern of IIT over the period of study, while inter-industry trade characterized trade with Japan. Trade with ASEAN had witnessed a growing importance of IIT in the 1990s. Second, a large share of trade with all three countries involved the electrical and electronics and machinery manufacturing products. However, the structure of trade flows with the three trade partners was distinctly different. More than 50 per cent of trade in the two major traded products with ASEAN was IIT while trade with Japan for these products was of one-way trade. Trade with the US can be considered as IIT only for electrical and electronics. Third, VIIT was a large share of IIT in bilateral trade with all three countries. However, VIIT took the form of a combination of high and low-valued imports in the case of Malaysia-ASEAN trade and a shift towards high-valued imports in the case of Malaysia-US trade and Malaysia-Japan trade.

The three major differences in trade flows of the three key trading partners of Malaysia as cited justify the need to distinguish import sources and export destinations in order to appropriately capture the effects of trade on employment.

The panel estimates imply that trade between Malaysia and her major trading partners (ASEAN and Japan and the US) do not seem to lend support to the widespread fears that these flows might cause serious disruptions to the labour market. On the contrary, imports from these partner countries are found to be beneficial, in the sense of exerting overall positive pressures on labour demand. If the broad trends in trade continue unabated, a rise in imports from these countries will not impose an actual threat to labour demand.

However the impact differs across skills. Contemporaneous imports from all countries benefits skilled labour significantly. Imports from ASEAN and Japan also benefits unskilled labour. In the long run, imports from Japan are found to have the largest impact on aggregate labour and skilled labour whilst imports from the ASEAN for unskilled labour. Conversely the short run impact of export sources does not matter much for labour. Only exports to the US have a significant negative impact on unskilled labour. It is worth pointing out that in the long run, exports to the US have a consistent negative impact on labour (both skilled and unskilled), in contrast to a positive impact of exports to Japan.

In terms of IIT effects on the labour market, the panel estimates point to a significant positive impact of IIT with the ASEAN on all labour types. Though IIT with the US and Japan do not significantly matter for employment, IIT with Japan has a negative impact on skilled labour in the short and long run.

Overall, the analysis though did not reveal any distinct relationships between changes in imports of different trading partners and changes in aggregate labour, fairly clear relationships are observed when different skills are considered. Market sourcing of imports matters for skills. Strong association with skills is accrued to imports from the ASEAN and Japan vis-à-vis other key trading partners of Malaysia, particularly in the long run. A by-product of the analyses on the impact of IIT with the various trading partners indicates the sole importance of IIT with the ASEAN for labour demand vis-a-vis the US and Japan.

Appendix 1: Number of Traded Products, by Major Industry Group

Industry	ASEAN-4		US		JAPAN	
	1983	2000	1983	2000	1983	2000
Food	455	733	351	482	314	329
Beverages & Tobacco	33	43	32	34	16	29
Textile & Textile Products	586	728	419	494	559	480
Leather & Leather Products	21	21	14	11	17	13
Wood & Wood Products	95	337	51	123	81	199
Furniture & Fixtures	30	35	24	31	27	30
Paper, Printing & Publishing	101	169	85	149	97	149
Chemical & Chemical Products	475	826	436	706	411	663
Petroleum Products	36	43	27	27	29	28
Rubber Products	117	183	100	127	105	150
Plastic Products	175	241	145	203	183	224
Non-Metallic Mineral Products	54	96	42	71	52	81
Basic Metal Products	218	465	164	280	247	464
Fabricated Metal Products	199	310	189	255	205	273
Machinery Manufacturing	377	693	380	628	390	663
Electrical & Electronic Products	268	422	251	398	277	393
Transport Equipment	91	222	60	126	89	265
Scientific & Measuring Equipment	111	250	111	233	118	247
Miscellaneous	238	331	215	285	231	270
TOTAL	3680	6148	3096	4663	3448	4950

Source: Calculated from *Malaysia: External Trade Statistics*, various years.

Appendix 2: GMM Estimates of Employment Equations, Incorporating Trade Flows by Trading Partners (one step results)

Independent Variable	(1) coefficient	(1) Std. Err.	(2) coefficient	(2) Std. Err.	(3) coefficient	(3) Std. Err.
Cons	0.002	0.002	0.003**	0.002	0.001	0.002
N(t-1)	0.014	0.102	-0.129	0.135	-0.277	0.173
N(t-2)	-0.055	0.065	-0.135*	0.043	-0.208*	0.043
Wt	-0.939*	0.122	-0.944*	0.124	-0.088**	0.050
Wt-1	-0.215*	0.105	-0.062	0.156	-0.120**	0.062
Wt-2	-0.281*	0.103	-0.219*	0.101	-0.119	0.093
VAt	0.120	0.078	0.074	0.080	0.241*	0.123
(VA)t-1	0.043	0.043	0.068	0.045	0.071**	0.042
(VA)t-2	0.029	0.039	0.033	0.042	0.054	0.056
(FDI/CI)t-1	neg.	-	neg.	-	neg.	-
(FDI/CI)t-2	neg.	-	neg.	-	neg.	-
(FDI/CI)t	0.001	neg.	0.001**	neg.	0.001*	neg.
XASEANt	-0.019	0.033	-0.006	0.036	0.096	0.070
(XASEAN)t-1	-0.010	0.034	0.042	0.027	0.012	0.049
(XASEAN)t-2	-0.013	0.018	-0.008	0.025	-0.036	0.037
XUSt	-0.007	0.016	0.002	0.019	-0.053*	0.016
(XUS)t-1	0.012	0.010	-0.009	0.015	neg.	-
(XUS)t-2	-0.006	0.017	-0.006	0.019	-0.030	0.037
XJAPANt	0.018	0.015	0.027	0.018	0.045	0.028
(XJAPAN)t-1	0.009	0.012	0.025*	0.013	-0.003	0.018
(XJAPAN)t-2	0.025	0.015	0.031**	0.017	0.054*	0.025
XROWt	-0.022	0.022	-0.050*	0.022	0.018	0.031
(XROW)t-1	-0.061*	0.016	-0.059*	0.020	-0.005	0.031
(XROW)t-2	-0.016	0.016	-0.009	0.020	0.019	0.018
MASEANt	0.042*	0.018	0.059*	0.022	0.105*	0.037
(MASEAN)t-1	0.020	0.029	0.058**	0.031	0.069**	0.039
(MASEAN)t-2	0.019	0.021	0.066*	0.024	0.064**	0.033
MUSt	0.029**	0.017	0.033**	0.019	0.015	0.021
(MUS)t-1	0.045*	0.018	0.031	0.024	0.020	0.027
(MUS)t-2	-0.013	0.020	-0.014	0.023	-0.038**	0.022
MJAPANt	0.057*	0.024	0.055**	0.033	0.121*	0.033
(MJAPAN)t-1	0.051*	0.021	0.069*	0.020	0.046*	0.020
(MJAPAN)t-2	0.018	0.026	0.077*	0.036	-0.046**	0.028
MROWt	0.050*	0.024	0.049**	0.028	0.095*	0.043
(MROW)t-1	0.074*	0.030	0.071*	0.035	0.119*	0.052
(MROW)t-2	0.002	0.018	0.033	0.021	0.028	0.033
2nd order serial correlation	-1.72		-1.65		-1.70	
No. of obs.	266		266		266	

Note: 1. The dependent variable is employment for specification (1), while specifications (2) and (3) refer to skilled employment and unskilled employment respectively.

2. The robust standard errors are reported.

neg. - negligible.

* significant at 5% and ** significant at 10%

Appendix 3: GMM Estimates of Employment Equations, Incorporating Trade Specialization by Trading Partners (one step results)

Independent Variable	(1)		(2)		(3)	
	coefficient	Std. Err.	coefficient	Std. Err.	coefficient	Std. Err.
Cons	-0.001	0.002	neg.	-	-0.002	0.002
N(t-1)	0.027	0.112	-0.007	0.157	-0.215	0.187
N(t-2)	-0.070	0.081	-0.123**	0.071	-0.173*	0.070
N(t-3)	0.126*	0.055			0.314**	0.181
Wt -0.907	0.127	-0.914*	0.130	-0.132**	0.073	
Wt-1	-0.235	0.081	-0.092	0.148	-0.178*	0.085
Wt-2	-0.400	0.110	-0.321*	0.130	-0.224**	0.122
VAt 0.170*	0.081	0.134	0.081	0.330*	0.126	
(VA)t-1	0.078	0.050	0.088	0.058	0.120*	0.047
(VA)t-2	0.047	0.047	0.080	0.052	0.046	0.066
(FDI/CI)t-1	neg.	-	neg.	-	0.001	0.001
(FDI/CI)t-2	neg.	-	neg.	-	0.001	0.001
(FDI/CI)t	0.001*	neg.	0.001*	neg.	0.002*	0.001
(GLASEAN)t	0.001*	0.001	0.002*	0.001	0.001**	0.001
(GLASEAN)t-1	0.001	0.001	0.001**	0.001	0.001	0.001
(GLASEAN)t-2	neg.	-	0.001*	neg.	0.001	0.001
(GLUS)t	neg.	-	neg.	-	-0.001	0.001
(GLUS)t-1	0.001	0.001	0.001	0.001	neg.	-
(GLUS)t-2	0.001	0.001	0.001	0.001	0.001	0.001
(GLJAPAN)t	neg.	0.001	-0.001	0.001	neg.	-
(GLJAPAN)t-1	-0.001	-	-0.001**	neg.	-0.001	0.001
(GLJAPAN)t-2	0.002*	neg.	0.001	0.001	0.004*	0.001
(GLROW)t	neg.	-	neg.	-	0.001	0.001
(GLROW)t-1	-0.002*	0.001	-0.001	0.001	neg.	-
(GLROW)t-2	-0.001*	0.000	neg.	-	-0.001*	0.001
2nd order serial correlation	-0.86		-1.40		-0.77	
No. of obs.	247		266		247	

Note: 1. The dependent variable is employment for specification (1), while specifications (2) and (3) refer to skilled employment and unskilled employment respectively.

2. The robust standard errors are reported.

neg. - negligible.

* significant at 5% and ** significant at 10%

ENDNOTES

[1] This level of aggregation is expected a priori to be lower than indices based on three digit figures. However this level of aggregation is chosen merely for the calculation of unit values.

[2] For example, the export similarity index for Malaysia and Singapore is relatively high at 0.62 (see Doan, 2003),

[3] Ghose (2000) claims that the employment effects of trade in manufactures are potentially positive and large in developing countries, particularly exports to industrialized countries increases demand for both unskilled and skilled labour.

[4] Lovely and Richardson (1998) argue that IIIT indices cannot be meaningfully included in the same regression with trade measures, since the respective measures are non-linear transformations of the others. Their argument is that one cannot meaningfully hold two constant and let the third vary. As such, the impact of trade flows and trade structure are examined independently in the employment equations.

[5] Based on the East Asian intra regional trade in parts and components in 2001, 33 per cent of Malaysia's regional parts and components originated in Japan as opposed to 30 per cent from ASEAN (see Ng and Yeats, 2003).

REFERENCES

Arellano, M. and Bond, S. (1991) 'Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations, '*Review of Economic Studies*, 58(2): 277-297.

Balassa, B. (1986) 'The employment effects of trade in manufactured products between developed and developing countries, '*Journal of Policy Modelling*, 8(3): 371-390.

Bashir, M.S. and Rashid, Z.A. (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.

Brulhart, M. and Rob Elliot (2000) 'Labour-market èffects of intra-industry trade: Evidence for the United Kingdom, 'Research Paper 2000/21, Centre for Research on Globalisation and Labour Markets, University of Nottingham, UK.

Brulhart, M. and Thorpe, M. (2000) 'Intra-industry trade and adjustment in Malaysia: Puzzling evidence, '*Applied Economics Letters*, 7(11): 729-733.

Doan, H.Q. (2003) 'Improving competitiveness in the framework of an ASEAN economic community: Challenges and opportunities, ' paper presented at the 28th FAEA Conference on ASEAN's competitiveness, 19-21 December, Batam Island, Indonesia.

Elliott, R.J.R. and Ikemoto, K. (2004) 'AFTA and the Asian crisis: Help of hindrance to ASEAN intra-regional trade? '*Asian Economic Journal*, 18(1): 1-23.

Feridhanusetyawan, T. and Stahl, C.W. (1999) 'The impact of trade liberalisation on labour markets in the Asia Pacific region, ' mimeo.

Feridhanusetyawan, T. (1998) 'The impact of trade liberalization on welfare and employment in ASEAN, ' paper presented at the Third Workshop of the ACIAR Indonesia Research Project, 24-25 February, Adelaide.

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

Ghose, A.K. (2000) 'Trade liberalization and manufacturing employment, ' Employment Paper 2000/3, International Labour Office, Geneva.

Greenaway, D., Hine, R.C. and Milner, C. (1995) Vertical and horizontal intra-industry trade: a cross-industry analysis for the United Kingdom, *Economic Journal*, 105: 1505-1518.

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

Grubel, H.G. and Lloyd, P.J. (1975) *Intra-Industry Trade: The Theory and Measurement of International Trade in Differentiated Products*, US: John Wiley & Sons.

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

Hurley, D.T. (2003) 'Horizontal and vertical intra-industry trade: The case of ASEAN trade in manufactures,' *International Economic Journal*, 17(4): 1-14.

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

Khalifah, N.A. (2000) 'A typology of Malaysia's trade flows (1990-1997): Structural shifts in the merchandise trade balance,' *IIUM Journal of Economics and Managemen*, 8(2): 109-138.

Lovely, M.E. and Richardson, J.D. (1998) 'Trade flows and wage premiums: Does who or what matter?' NBER Working Paper 6668, National Bureau of Economic Research, US.

Mansor, S.Z. and Radam, A. (2001) 'Malaysian vertical and horizontal intra industry trade with European Union,' Working Paper 22/2001, Universiti Putra Malaysia, Malaysia.

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

Murshed, S.M. (2001) 'Patterns of East Asian trade and intra-industry trade in manufactures,' *Journal of the Asia Pacific Economy*, 6(1): 99-123.Ng, F. and Yeats, A. (2003) 'Major trade trends in East Asia,' World Bank Research Working Paper 3084, World Bank, US.

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

Sakurai, N. and Moriizumi, Y. (2000) 'Trade patterns and factor use: Evidence for Asia Pacific countries,' paper presented at the 13th International Conference on Input-Output Technique, 21-25 August, Macerata, Italy.

Tachibanaki, T., Morikawa, M. and Nishimura, T. (1998) 'Economic development in Asian countries, and the effect of trade in Asia on employment and wages in Japan,' *Asian Economic Journal*, 12(2): 123-151.

Tham, S.Y. (2003) 'ASEAN's competitiveness in manufacturing automotive' paper presented at the 28th FAEA Conference on ASEAN' competitiveness, 19-21 December, Batam Island, Indonesia.