*IIUM Journal of Economics and Management* 8, no. 2 (2000): 109-38


# A TYPOLOGY OF MALAYSIA'S TRADE FLOWS (1990-1997): STRUCTURAL SHIFTS IN THE MERCHANDISE TRADE BALANCE*

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## ABSTRACT

Malaysia's merchandise trade flows between 1990-1997 is decomposed into intra-industry trade (*IIT*) and net trade (*NT*). *NT* is further decomposed into net exports and net imports to evaluate the changing structure of trade on the merchandise trade balance. The Grubel-Lloyd (*GL*) index was used to indicate the share of *IIT* in total trade (*TT*). This accounting framework shows that total trade in the electronic sector (*GL* > 0.7) increased from 28 percent of *TT* in 1990 to 45 percent in 1997 with SITC 776 (*GL* > 0.91) accounting for 13 to 20 percent of Malaysia's *TT* for the various years. Over the study period, the trade share of the primary sector decreased from 30 percent of total trade (*TT*) to 16 percent with the surplus of the primary sector decreasing from 14.87 percent of *TT* in 1990 to 5.42 percent in 1997. The manufacturing sector is always at a deficit although narrowing from -12.24 percent of *TT* in 1990 to -4 percent in 1997 with some fluctuations in the intervening years. The factors that possibly contributed to the increased internationalization of production as demonstrated by the increasing *GL* indices from 0.416 to 0.556 are also examined. Vertical *IIT* rather than horizontal *IIT* seem to prevail. Government policy like the promotion of the multimedia super corridor does seem to have an impact on Malaysia's trade structure, and subsequently on the structure of the merchandise trade balance.

JEL Classification: F10

Keywords: Malaysia, Trade balance, Intra-industry trade, Typology of trade

*This paper was written while the author was on sabbatical leave from Universiti Kebangsaan Malaysia (National University of Malaysia) from April to December 1999. The author is grateful to A.K.M. Azhar and two anonymous referees for their comments and the Department of Statistics, Malaysia, for providing the trade data. Research funding from IRPA (Intensified Research in Priority Areas) Research Grant No. 51376 awarded by the Ministry of Science, Technology and Environment, Malaysia, is kindly acknowledged.

## 1. INTRODUCTION

In the aftermath of the Asian financial crisis in 1997, many factors have been linked to the currency crisis which seemed to have contributed to a reversal of "*The East Asian Miracle*". This paper seeks to examine from the real side (as opposed to the financial side), one of the many factors that help shape investors' confidence in the strength of a currency, namely, the intertemporal figures of a country's merchandise trade accounts.[1] When examining the trade balance, researchers can focus on the bilateral trade balance between countries and this is then aggregated to arrive at the trade balance. Country factors are sought as explanations of the trade pattern in the gravity approach, pioneered by Tinbergen (1962). In this paper, the industry factors are addressed as explanations of trade. Inevitably, industrial organization enters into the picture and in the case of a country like Malaysia where direct foreign investment (DFI) is prominent; the impact of DFI on industrial organization, and henceforth trade, cannot be ignored.

We propose to frame the entire merchandise trade of Malaysia in terms of unmatched inter-industry or net trade (*NT*) and intra-industry trade (*IIT*) or matched trade. *NT* is further classified into net exports or net imports. As far as the author is aware of, the systematic decomposition of *NT* into net exports (*NX*) or net imports (*NM*) with *IIT* as the other component of total trade (*TT*) has not been empirically examined, at least for the case of Malaysia. This typology of trade flows immediately shows which commodities or industries contribute towards inflows of foreign exchange and which industries contribute towards outflows of foreign exchange and, therefore, the net impact of the different industries on the balance of payment. The Grubel-Lloyd (*GL*) index shows the share of *IIT* in *TT* and serves to indicate the degree of globalization or internationalization of a particular industry. Thus, only the industry characteristics and not country characteristics will be addressed in this paper. The time frame for this analysis is 1990-1997.[2] Section 2 explains the framework of analysis and data, while Section 3 presents the results of the study at the different levels of aggregation. Policy implications and the conclusion appear in Section 4.

## 2. FRAMEWORK OF ANALYSIS

Analysis of trade flows is normally conducted in terms of exports ($X$) and imports ($M$). Total trade ($TT$) is equal to ($X + M$). The trade balance ($X - M$) is then derived by subtracting $M$ from $X$. However, this conventional way of analyzing trade balance fails to portray the underlying trade structure of a particular country since the trade balance of a particular commodity can be negative or positive, and in the process of aggregation to arrive at meaningful aggregates, the positive and negative values cancel each other resulting in the loss of vital information. For the economy as a whole, the trade balance

($X - M$) is relatively small compared to *TT* and the growth of the trade balance does not convey much information about the net contribution of the different commodities to arrive at the trade balance.

Two measures are commonly used to analyze the trade pattern across time of particular commodities: the absolute and relative changes over time. These measures individually do not reflect the importance of particular commodities since each has its own limitations. Absolute measures tend to obscure the differential growth rate in commodity trade by tending to overstate the growth of commodities with a larger trade share and understating the growth of commodities with a lower trade share. On the other hand, percentage measurements tend to overstate the growth of trade of commodities with a lower trade share and understate the growth of trade of commodities with a larger trade share. In this study, we propose to use shares of intra-industry trade and net trade in total trade for a particular year, to evaluate the changing structure of Malaysia's trade over time.

Lundberg (1992) decomposed trade flows into *IIT* and *NT* and estimated the determinants of these two types of trade. We propose to decompose Malaysia's trade flows into *IIT* and *NT*, but in our case *NT* is further decomposed into net exports (*NX*) and net imports (*NM*) to evaluate the changing structure of the merchandise trade balance over the 1990-1997 period. The current level of development of statistics (or rather "published" statistics) in Malaysia does not permit a direct test of the different trade theories. This decomposition of trade flows will serve as an indirect test of the implications of the different trade theories. Traditional Heckscher-Ohlin theory based on factor endowments postulated trade of the inter-industry or net trade (*NT*) type, although intra-industry trade (*IIT*) is an undeniable fact of modern economies with similar factor endowments. *IIT* refers to simultaneous export and import of products produced within the same industry. Perfect competition, an element of traditional trade theory is an impossible market structure under conditions of diverse preferences and infinitely variable product specifications (Lancaster, 1980). In this case, *IIT* occurs in differentiated consumer goods on the demand side, or to satisfy consumer tastes for variety. In other cases, *IIT* occurs on the production or supply side which "... consists of the specialized production and cross-hauling of slightly differentiated intermediate components to satisfy finished goods producers' demands for diverse production components in order to keep costs down" (Ray, 1991, 170).

Tharakan (1989) contends that the majority of *IIT* between the North and South hides neo-Heckscher Ohlin trade whereby developing countries import high quality products and exports low quality products, or they import intermediate goods to be processed and then exported as manufactured goods, in accordance with the South's comparative advantage at this stage of production. Vertical *IIT* involves differences in the quality of similar products whereas horizontal *IIT* refers to different types of products with similar quality (Greenaway and Milner, 1986). The decompositon of trade flows allows us to identify the type of products that exhibit high *IIT*. This enables us to discern if

the *IIT* of a developing country like Malaysia appears on the demand side like that of differentiated consumer goods in industrial countries or on the supply side reflecting neo-Heckscher-Ohlin kind of trade in the form of vertical *IIT* rather than scale economies in the form of horizontal *IIT*, as witnessed in the industrial countries.[3] Vertical *IIT* on the supply side in developing countries may reflect the internationalization of production and trade (especially intra-firm trade) and the increased role of multinationals and direct foreign investment in vertically integrated industries in the world economy. Therefore,

$$(1) \qquad TT = X + M = [X + M - |X - M| + |X - M|] = IIT + NT$$

where $NT = |X - M|$.

Net trade or unmatched trade or one-way trade shows the absolute value of $(X - M)$. For a particular commodity $i$ with a positive trade balance, $NT_i = X_i - M_i$ and $NT_i$ shows unmatched exports. But in cases of a negative trade balance, $NT$ shows unmatched imports. For the purpose of this paper, the unmatched trade component ($NT$) is recorded as unmatched exports or unmatched imports for a particular industry. At the industry (3-digit) level, net export industries are denoted by industries in set $i$ while net import industries are denoted by industries in set $j$. Thus,

$$(2) \qquad NX_i = (X_i - M_i) > 0$$

$$(3) \qquad NM_j = (M_j - X_j) > 0$$

This unmatched $X$ and unmatched $M$ can then be aggregated to evaluate its impact on the trade balance. At a higher level of aggregation, say $k$,

$$(4) \qquad \begin{aligned} NT_k &= \Sigma_i (X_i - M_i) + \Sigma_j (M_j - X_j) \\ &= NX_k + NM_k \end{aligned}$$

The matched (two-way) trade component is *IIT*, and for industry $i$:

$$(5) \qquad IIT_i = (X_i + M_i - |X_i - M_i|)$$

At a higher level of aggregation, say $k$,

$$(6) \qquad IIT_k = \Sigma_{i \in k} IIT$$

This typology of trade flows in absolute values allows for aggregation across industries.

This paper uses both an absolute value approach as well as a share approach to show the significance of *IIT* and one-way trade in Malaysia's trade flows. Since the value of *TT* changes from one year to another, and we are interested in evaluating the changing structure of trade as to whether it is matched trade (*IIT*) or unmatched trade over the study period, we take percentages of *IIT* and *NT* with respect to *TT*[4] for each year. Thus, the different trade components are additive across the different industries and also across the different types of trade for a particular year, and in this sense, resembles that of an absolute measure. In order to evaluate the importance of matched trade for a particular commodity, we use the Grubel-Lloyd (*GL*) index which is a share measure. The *GL* index measures the share of *IIT* in industry *i* for a given country; where $X_i$ and $M_i$ are the exports and imports of industry *i* during a particular time period, usually one year. The index can take any value between 0 and 1 where the upper bound represents all trade being *IIT* in nature (see Greenaway and Milner, 1986, and Kol, 1988, for a detailed discussion of this index).

$$(7) \qquad GL_i = 1 - \frac{|X_i - M_i|}{X_i + M_i}$$

The following aggregation formula is used to determine the *GL* index for aggregated categories (*k*).

$$(8) \qquad GL_k = \frac{\Sigma_{i \in k} IIT_i}{\Sigma_{i \in k} TT_i}$$

The higher the *GL* index, the larger the matched component of trade reflecting a higher level of internationalization for the industry be it from the production side or consumption depending on the industry being examined. The proportion of net trade in *TT* can simply be obtained by subtracting the *GL* index from 1.[5]

We decompose Malaysia's trade at the highly aggregated single-digit level into matched and unmatched trade and the latter is further decomposed into net exports and net imports (*NX* and *NM*). By subtracting unmatched *M* from unmatched *X*, we can observe the impact of the different sections on the trade balance. This documentary analysis is then conducted at a modestly aggregated level (2-digit) for SITC 7 since this section has the highest contribution towards trade and accounts for the major changes in the structure of trade. Subsequently, the analysis is conducted at the most disaggregated level (3-digit) in order to identify the industries that contribute the most to inflows and outflows of foreign exchange.

The definition of "industry" employed in decomposing *TT* into *IIT* and *NX* or *NM* is an important issue for studies involving *IIT*. Finger (1975) pointed out that overlapping trade within a 3-digit SITC category can still refer to Heckscher-Ohlin trade since trade within a category may represent goods with different factor characteristics. According to the study of industrial organization

and trade theory, products that are close substitutes in demand and produced with similar factor intensities should be gathered together into an industry. Disaggregation at the 3-digit level of the Standard International Trade Classification (SITC) is standard in studies on *IIT* (see Greenaway and Milner 1983; Greenaway and Tharakan, 1986). Data were obtained from the *External Trade Statistics* published by the Department of Statistics, Malaysia, which consists of 262 industries at the 3-digit level. Commodities in SITC 1 to SITC 4 are classified as primary sector commodities, while SITC 5 to SITC 8 show manufactured products. Food, in general, includes SITC 0 + 1 + 22 + 4 but in this paper, as an approximation, food refers to SITC 0 + 1 + 4. According to the SITC, processed food is not categorized as manufactures, that is, it is not included in SITC 5 – SITC 8 (see Hirata, 1988). SITC 6 shows trade of manufactured goods classified chiefly by material like leather, rubber, cork and wood, paper, textile yarns, fabrics, non-metallic mineral manufactures, iron and steel, non-ferrous metals and manufacture of metals, while SITC 8 deals with trade of miscellaneous manufactured articles.

## 3. TYPOLOGY OF MALAYSIA'S TRADE FLOWS

### 3.1 HIGHLY AGGREGATED (1-DIGIT SITC)

Abstracting from the effects of the Asian financial crisis which began around July 1997, the analysis of the pattern of Malaysia's trade flows from 1990 to 1997 (the latest available detailed data at this juncture) is very revealing. It can be gleaned from Table 1 (see Appendix) that in a span of eight years, the changes in the structure of Malaysia's trade reflect that of a developing economy moving towards "maturity". How much of this "maturity" is borrowed or dependent in the sense of being generated by MNCs based in Malaysia and not Malaysia's factors of production is not being directly addressed in this paper.[6] In 1990, the primary sector contributed about 30 percent to total trade but this share measure continuously declined over the period of analysis to roughly half its initial value, representing 16 percent of trade in 1997. At the single-digit level, where the primary sector is concerned, SITC 3 (mineral fuels, lubricants and related materials) registered the largest decline in its share of *TT*, from 12 percent in 1990 to 6 percent in 1997. The share of crude materials, inedibles, except fuels (SITC 2) registered a continuous decline from 8.8 percent to 3.53 percent of *TT* over the period of analysis. The share of food and live animals (SITC 0) and beverages and tobacco (SITC 1) together represented about 3 to 5 percent of *TT* while the share of animal and vegetable oils and fats (SITC 4) was roughly constant at about 3 to 3.5 percent of *TT* over the study period. Generally, the share of the food sector in trade (SITC 0 + 1 + 4) showed a slight decrease from 9 percent to 6.9 percent of *TT* between 1990 and 1997.

The bulk of the loss in the primary sector's (SITC 0 + 1 + 2 + 3 + 4) trade

share is being replaced by SITC 7 (machinery and equipment) of the manufacturing sector which continuously increased from 43 percent of *TT* in 1990 to 58 percent in 1997. The fluctuations in *TT* for manufactured chemicals (SITC 5), manufactured goods classified chiefly by materials (SITC 6) and finished manufactures (SITC 8) were rather minimal respectively representing 4 to 5 percent, 11 to 12 percent and 6.75 to 8 percent of *TT* between 1990 to 1997. Overall, the share of the manufacturing sector (SITC 5 + 6 + 7 + 8) in *TT* increased from 67.69 percent to 81.41 percent of *TT*, while SITC 9 (commodities and transactions not classified according to kind) represented between 1 to 3 percent of *TT*. The pattern of *TT* at this highly aggregated level shows the diminished importance of the primary sector, and the increasing importance of manufactures especially machinery and equipment in tandem with the growth of the Malaysian economy.

We now examine the pattern of one-way trade or net trade or unmatched trade or inter-industry trade which have been aggregated from the 3-digit level to the single digit level. Almost all trade for the different sections consists of both exports and imports with the exception of SITC 4, whereby Malaysia only exports animal and vegetable oils and fats (about 3 percent of *TT*) without any corresponding imports at the 3-digit level. The unmatched exports of the primary sector always exceeded that of the manufacturing sector between 1990 and 1992 (see Table 1). But in 1993, the unmatched export of the manufacturing sector, at 13.22 percent of trade exceeded the unmatched exports of the primary sector which accounted for 12.29 percent of total trade. This reversal in trend continued for the remaining period of analysis. The unmatched exports of the primary sector continuously declined from 19.42 percent of *TT* in 1990 to 8.42 percent in 1997. The unmatched exports of the manufacturing sector continuously increased from 9.84 percent of *TT* in 1990 to 13.47 percent in 1994. It then decreased slightly to 13.17 percent of *TT* in 1995 before hitting a high of 14.13 percent in 1996. The unmatched imports of the manufacturing sector (roughly between 18 to 22 percent of *TT*) far exceeded that of the primary sector (2.5 to 4.5 percent of *TT*) throughout the period of analysis and this phenomena definitely mimics that of a developing economy.

If we look at the difference between unmatched exports and unmatched imports for the different sectors, the primary sector is always at a surplus although the surplus continuously declined from 14.89 percent of *TT* in 1990 to 5.42 percent in 1997. The decline in surplus of the primary sector can be attributed to the decline in unmatched exports of SITC 2 (crude materials) and SITC 3 (petroleum). The manufacturing sector is always at a deficit, with the deficit generally getting smaller although with some minor fluctuations. The extreme values of the manufacturing sector's deficit are -12.24 percent of *TT* in 1990 and -4 percent in 1997. Finished manufactures (SITC 8) always registered surpluses of about 2 percent of *TT* while chemicals (SITC 5) and manufactured materials (SITC 6) registered deficits of between 2 to 4 percent each. Machinery and equipment (SITC 7) registered deficits of between -7.83 percent (1991) and -2 percent (1997) with a general trend of declining

deficits. These figures suggest the role of the primary sector in making available funds to finance purchases in the manufacturing sector throughout the study period which is typical of developing economies although this role of the primary sector is declining in importance over time as the Malaysian economy matures.

*IIT* in the primary sector was between 4.36 percent and 5.64 percent of *TT* over the period studied mainly from the food and live animals (SITC 0) and petroleum (SITC 3) sectors. The *GL* index was at 0.19 in 1990 and 1991 and thereafter the *GL* index kept increasing and settled at 0.28 in 1997 showing the increasing importance of *IIT* even in the primary sector. *IIT* in the manufacturing sector constituted 36 percent of *TT* in 1990 and continuously increased over the period of study representing 50 percent of total trade in 1997. *IIT* in the chemicals sector was the least between 1.5 and 3.0 percent of *TT* followed by *IIT* in the finished manufactures category (SITC 8) which was relatively stable between 3.11 and 3.58 percent of *TT* over the period of study. In the manufactured materials section (SITC 6), *IIT* was between 4.5 percent and 5.5 percent of *TT* with no discernible pattern. *IIT* in Section 7 registered the highest increase from 26.66 percent of *TT* in 1990 to 38.37 percent of *TT* in 1997 with the *GL* index fluctuating between 0.62 and 0.66. The *GL* index for the manufacturing sector was 0.53 in 1990 and showed yearly increments of about 0.02 each year until 1993 where the *GL* index was 0.59, after which it fell slightly and then increased again continuously to attain the value 0.61 in 1997.

From the above analysis at the most aggregated level, it can be observed that SITC 7 (machinery and equipment) increased its share with respect to *TT* (42.94 to 58.15 percent of *TT*), *IIT* (26.66 to 38.37 percent of *TT*) and unmatched exports (except for a slight fall in 1997, possibly due to the currency crisis) from 4.58 percent of *TT* to 9 percent over the study period. In the case of unmatched imports, the share of SITC 7 fluctuated between 10.2 percent and 12.76 percent of *TT*. This pattern of trade led to a decline in deficits for SITC 7 from -7.83 percent of *TT* in 1991 to -2 percent of *TT* in 1997.

### 3.2 MODESTLY AGGREGATED TRADE PATTERNS FOR MACHINERY AND EQUIPMENT (SITC 7)

We now examine the typology of trade flows for the divisions in SITC 7. This examination at a more disaggregated level is warranted since section 7 is the most important contributor to Malaysia's trade and the fastest growing section. The typology of trade flows for SITC 7 is presented in Table 2 (see Appendix) for selected years and are based on percentages of *TT* for the respective years.

The share of industrial[7] machinery (SITC 71 + 72 + 73 + 74) in *TT* fluctuated between 8.35 percent and 10 percent of *TT* over the study period. Meanwhile, the share of electronic machinery (SITC 75 + 76 + 77) continuously

increased over the study period representing 28.48 percent of *TT* in 1990 and 44.67 percent in 1997. Therefore, over a span of eight years, the share of electronic machinery in total trade showed an increase of 16.2 percent while that of industrial machinery remained fairly stable with yearly changes not exceeding 1.5 percent. Together, the electronic and industrial machinery sectors represented more than half of Malaysia's trade from 1993 to 1997. Trade in the transport equipment (SITC 78 + SITC 79) sector represented between 4.5 and 6.0 percent of Malaysia's *TT* over the period of study.

In 1990, net trade in the industrial machinery sector was roughly the same amount as that of the electronic machinery sector, respectively representing 6.19 percent and 6.54 per cent of *TT*. In the industrial machinery sector, net trade mostly represented net imports while in the electronic machinery sector, unmatched exports represented about two and a half times the amount of unmatched imports in 1990. This pattern of unmatched exports and imports in the industrial machinery sector had led to deficits in the industrial machinery sector although the deficit has declined slightly between 1995 (-5.9 percent of *TT*) and 1997 (-5.33 percent of *TT*). The deficit in the transportation equipment sector narrowed from -3.56 to -2.12 percent of *TT* between 1990 to 1993. Between 1994 and 1995, the deficit widened and in 1997, the deficit of the transportation equipment sector was at -2.88 percent of *TT*.

Where the electronic machinery sector is concerned, *TT* in this sector continuously increased from 28.48 percent to 44.67 percent of *TT* in 1997. *TT* and *IIT* in SITC 77 (electrical machinery, apparatus and appliances, n.e.s) were always higher than that of SITC 75 (computers and office machines) and SITC 76 (telecommunications and sound recording apparatus), while *NT* was highest in SITC 76 which consisted mainly of net exports. On average, over the period of study, *TT* in SITC 77 was 2.3 times that of SITC 76 while trade of SITC 76 was 1.6 times that of SITC 75. But when we consider the trends, the percentage of SITC 77 in *TT* increased from 19 percent in 1990 to 26 percent in 1997, while the *TT* of SITC 76 increased from 7.6 percent in 1990 to 11.2 percent in 1994 after which it gradually decreased to 8.6 percent in 1997. This contrasts with the pattern of SITC 75 where *TT* increased continuously from 2.32 percent of *TT* in 1990 to 10.24 percent in 1997.

In 1990 and 1991, SITC 75 (computers and office machines) had some unmatched imports (see Table 2) but from 1992 onwards, unmatched imports were zero. The Asian financial crisis did not hamper the unmatched exports of SITC 75. Over the period of study, unmatched exports of SITC 76 ranged from 3.35 percent of *TT* to 5.72 percent for the various years, while unmatched imports varied between zero and 0.55 percent of *TT* with values closer to zero occurring most of the time. On the other hand, SITC 77 (electrical machinery, apparatus and appliances, n.e.s) always generated deficits, with a sharp increase in deficits between 1993 (-1.9 percent of *TT*) and 1994 (-3.8 percent of *TT*). This sharp increase may be attributed to the Asean Free Trade Agreement (AFTA) and the changing division of labor associated with it, whereby SITC 75 and SITC 76 representing higher value-added products replacing SITC 77,

which represented mainly intermediate parts and components as net revenue generators.[8] The deficits in SITC 77 for the years 1990, 1991, and 1992 were respectively -0.73, -0.68 and -1.66 percent of *TT*, while for 1995, 1996 and 1997 the deficits were -3.64, -3.46 and -2.57 percent of *TT*, respectively. Generally, the electronic machinery sector sustained surpluses of between 4 to 6 percent of *TT* from 1992 onwards because the surpluses in SITC 75 and SITC 76 could more than offset the deficits in SITC 77.

When all divisions in SITC 7 are simultaneously considered, division 76 (telecommunications and sound recording apparatus) generated the most revenue followed by division 75 (office machines and automatic data processing equipment). In 1990, division 72 (machinery specialized for particular industries) generated the largest deficit followed by division 78 (road vehicles, including air-cushion vehicles) and division 74 (general industrial machinery and equipment, and parts). Between 1994 to 1997, division 77 generated the largest deficit followed by division 72. Occasionally, division 74 and 78 took turns occupying the third place where generating deficits are concerned, between the same period. Although the electronic and machinery sectors as a whole generated increasing surpluses, the surpluses only managed to narrow the deficits of the industrial machinery and transportation equipment sectors resulting in overall deficits of -7.83 to -2.02 percent of *TT* over the study period for SITC 7.

If we were to examine absolute amounts of *IIT* for SITC 7, we can observe that SITC 77 (electrical machinery, apparatus and appliances, n.e.s), generates the largest amount of *IIT* and this amount continuously increased throughout the period of study. At the beginning of the period examined, *IIT* in SITC 77 represented 15.89 percent of *TT* and at the end of the study period, *IIT* represented 23.04 percent of *TT*. In 1997, net trade in SITC 77 represented about 3 percent of *TT*. Thus, more than one-quarter of Malaysia's trade in 1997 is accounted for by this single division out of the possible 62 divisions in the SITC categorization. The *GL* indices of between 0.84 to 0.89 also attest to the significance of *IIT* in SITC 77.

*IIT* in household electronics (SITC 76) was the second largest contributor to *IIT* for the years 1990 to1995, ranging from 4.24 percent to 5.48 percent of *TT* for the different years. In the years 1996 and 1997, SITC 75 (computers and office machines) traded positions with SITC 76 as the second largest generator of *IIT*, with SITC 75 generating 5.05 percent and 6.15 percent of *TT* which is *IIT* in nature for the respective years. In comparison, for the years 1996 and 1997 respectively, SITC 76 generated 4.19 percent and 3.9 percent of *TT*, which is *IIT* in nature. This apparent shift in *IIT* (and *TT*) ranking between SITC 76 and SITC 75 possibly reflects Malaysia's policy emphasis on the multimedia super corridor and the information sector. Thus, the electronic machinery sector generated high amounts of *IIT* which represented 21.95 percent of *TT* in 1990 and continuously increased to 33 percent in 1997. On the other hand, *IIT* in the industrial machinery sector and transportation equipment sector each contributed between 2 per cent to 4 per cent of *TT* over the study period.

### 3.3 INDUSTRIES WITH HIGHEST AND LOWEST FOREIGN EXCHANGE EARNINGS (TOP 10)

At this detailed industry (3-digit SITC) level, we seek to illuminate how the different industries interact in generating the trade balance be it from the primary or manufacturing sectors. In Table 3 (see Appendix) , we show the top ten industries with the largest unmatched exports and imports as a percentage of *TT*. Although the analysis is based on a span of eight years, the general trends are quite obvious. The top ten commodities generating the largest net export values were mostly from the primary sector in the earlier part of the period, but the importance of the primary sector in generating net revenues gradually declined. In 1990, SITC 333 (crude petroleum) was the largest generator of net export revenue for the Malaysian economy representing 6.45 percent of *TT*. This was followed by SITC 422 (other fixed vegetable oils) which generated net export revenue amounting to 2.71 percent of *TT* and SITC 247 (other wood in the rough or roughly squared) which is in primary form with unmatched exports representing 2.56 percent of *TT*. The fourth largest generator of net export revenue is SITC 248 (wood simply worked) which is a processed intermediate good with net exports amounting to 2.23 percent of *TT*.[9] In 1991, the three largest generators of net export revenues were similar to that of 1990, but the fourth largest position was replaced by SITC 762 (radio broadcast receivers). This replacement of primary industries by manufacturing industries in generating net export revenue can be gleaned from Table 3. In 1990, seven of the top ten generators of net export earnings belonged to the primary sector. But by 1996 and 1997, only four of the top 10 generators of net export earning belonged to the primary sector, namely SITC 422, SITC 333, SITC 343 (natural gas, whether or not liquefied) and SITC 248.

The manufacturing industries which generated large net export revenue exhibited some "upgrading". Goods from division 76 (telecommunication and sound recording apparatus) were of importance in the earlier part of the study period but these were then replaced by SITC 759 (parts and accessories for SITC 751 and 752) and later on by SITC 752 (automatic data processing machines and units thereof) which is a capital good. This "upgrading" phenomena can also be observed with respect to products from the primary sector as well. For example, in 1990, SITC 247 (other wood in the rough or roughly squared) was the third largest net exporter followed by SITC 248 (wood simply worked). In 1992, SITC 248 ranked higher (fourth) than SITC 247 (fifth) and in 1993, SITC 248 ranked fourth while SITC 247 ranked ninth. From 1994 onwards, SITC 247 dropped out of the top ten positions while SITC 248 continued to be featured in the top ten category. Further processing on wood and agricultural material also occurred and this manifested itself with the appearance of SITC 634 (veneers, plywood, improved or reconstituted wood) for the first time in the top ten list of net exporter industries in 1993 and

thereafter.[10] This wood-based product which has undergone significant processing is now classified as manufactured materials and to some extent reflects resource-based industrialization.

Another general trend is the decreasing concentration of the industries which generate large net export revenue throughout the study period. In other words, Malaysia now has a broader base of industries to rely on for net export revenue although the question of ownership of these industries as alluded to earlier on in the paper is not addressed here. In 1990, the top ten industries generated net export revenues amounting to 22 percent of *TT*, but by 1997, the top ten revenue generators generated only 15.39 percent of *TT*. This general trend of a broadening of the number of commodities that generate net revenues over time contrasts with that of industries which generated the largest unmatched imports.

Cumulative unmatched imports for the top ten industries which generated the largest outflows of revenues fluctuated over the period of study, at first decreasing and then increasing and then decreasing again. Generally, unmatched imports tend to have a broader base than unmatched exports. From Table 3, it can be gleaned that SITC 334 (petroleum products refined) is the only industry from the primary sector which generated large unmatched imports and that too, only for the years 1990 to 1994. The *GL* index of greater than 0.5 signifies the importance of *IIT* in SITC 334 and its disappearance from the top ten list of unmatched imports possibly signify that the processing of petroleum products is being carried out to a greater extent domestically, reducing the need for imports. There could also be a fall in demand for this product relative to other products. The largest generators of unmatched imports were mainly from the manufacturing sector. It is interesting to note that SITC 776 (thermionic, cold and photo cathode valves, tubes and parts) switched from being a net export to net import industry during the period of study. In 1990, SITC 776 was the eighth largest generator of revenue representing 0.87 percent of *TT* but from 1994 onwards, it became a net importer with net imports representing 1.12 percent (fourth position), 1.6 percent (second position), 1.73 percent (first position) and 1.11 percent (second position) of *TT* for the years 1994, 1995, 1996 and 1997, respectively.

Overall, where the *GL* indices are concerned, the industries in the primary sector had low *GL* indices (less than 0.5). These primary industries appeared mostly as large net export revenue generators. In some senses, this pattern of trade reflects comparative advantage *à la* the Heckscher-Ohlin theory, the workhorse of international trade theory in neoclassical economics. Industries in the manufacturing sector can be classified into two broad categories, irrespective of whether they generate large unmatched imports or exports. The first refers to manufacturing industries with high *GL* indices where Malaysia is part of the vertically integrated international production chain with no distinct direction with respect to trade of this kind. In this case, the MNCs are the major players deciding how production is organized depending on the relative costs and benefits of positioning different parts of the production

chain in different countries. This kind of trade can be considered neo-Heckscher-Ohlin trade. Of course, host country policies enter endogenously in the location decisions of MNCs. The second refers to manufacturing industries where the *GL* indices are low and direction of trade is skewed in one direction.

Manufacturing industries in the first category with high *GL* indices are SITC 776, SITC 772 (electrical apparatus such as switches, relays, fuses and plugs), SITC 778 (electrical machinery and apparatus, n.e.s) which belong to the electrical machinery, apparatus and appliances sector and which mainly consists of intermediate goods. As explained above, SITC 776 ($GL > 0.9$) switched from being a net export to net import industry while SITC 772 ($GL > 0.51$) and SITC 778 ($GL > 0.52$) had always been net importer industries over the study period. The high degree of internationalization of production in the electrical and electronics sector and the dominance of direct foreign investment in this sector in Malaysia possibly contributed to this pattern of trade.[11] SITC 759 (parts and accessories suitable for SITC 751 and 752) which is an intermediate good also had high *GL* indices (between 0.55 and 0.8) but it is a net export industry.

Manufacturing industries in the second category with relatively low *GL* indices include SITC 752 (automatic data processing machines and units thereof) which is a capital good and SITC 728 (industrial machinery), and resource-based industries like SITC 634, SITC 641, and SITC 673. Among the industries with low *GL* indices, SITC 752 and SITC 634 are net export industries while SITC 728, SITC 641 and SITC 673 are net import industries. Generally, industries with low *GL* indices reflect the Heckscher-Ohlin kind of trade. SITC 752 which is higher up the value added chain compared to SITC 759 had *GL* indices between 0.3 and 0.4 over the study period. SITC 752 only began to be featured in the top ten net export list in 1995 occupying the ninth position, quickly climbed to the second position in 1996 and the first position in 1997. This rapid growth in production and exports of SITC 752 could possibly be attributed to a policy induced phenomena with Malaysia emphasizing on the multimedia super corridor and information technology-based industries although SITC 752 can be considered as an MNC-dominated industry. The large net exports of the manufacturing industry, SITC 634 (veneers, plywood improved or reconstituted) clearly reflect Malaysia's endowment of forests while SITC 641 (paper and paperboard) with large net imports portrays the lack of endowment in pulp. Similarly, large imports in SITC 673 (flat-rolled products, of iron or non-alloy steel, clad, plated or coated) and SITC 728 (machinery and equipment specialized for particular industries and parts, n.e.s) reflect a comparative disadvantage in the production of these products and, hence, the need for imports.

Some industries like SITC 792 (aircraft and associated equipment and parts) though being a net importer (and sometimes dropping out of the top ten most important net import industries) show increasing *GL* values through time with *GL* indices of 0.42 and 0.68 in 1990 and 1995 respectively. SITC 971

(gold, non-monetary), representing the commodity with the highest unmatched imports in 1990 and 1991 and with relatively low *GL* values, has always remained in the top four position with respect to net outflows of trade revenue over the study period. But there is also the link with SITC 897 (jewelry, goldsmiths and other articles of precious materials) which is a manufacturing industry with net exports ranking among the top twenty net export revenue generators, although the net-exports of SITC 897 is much smaller than those of SITC 971. This suggests that some of the supplies of SITC 971 are consumed domestically, while others are processed domestically and then exported in manufactured form.

The above analysis at the industry level shows the interaction of comparative advantage/disadvantage in the Heckscher-Ohlin sense and the internationalization of production in the neo-Heckscher-Ohlin sense, especially in SITC 7, in determining the pattern of trade and subsequently the merchandise trade balance. Relative costs determine the pattern of production and trade, and government policies also has an impact endogenously on the cost structure of private firms whether they are national or multinational firms.

## 4. POLICY IMPLICATIONS AND CONCLUSION

Between 1990 and 1997, the trade share of Malaysia's primary sector decreased from 30 percent of total trade to 16 percent. The trade share of SITC 7 increased from 43 percent of total trade in 1990 to 58 percent in 1997. Where the trade balance is concerned, the primary sector is always at a surplus albeit decreasing from 14.89 percent of total trade in 1990 to 5.42 percent in 1997. The manufacturing sector is always at a deficit although narrowing from -12.24 percent of total trade in 1990 to -4 percent in 1997 with some fluctuations in the intervening years. At the 2-digit level for section 7, divisions 76 and 75 generated the most net revenues whereas divisions 77 and 72 respectively generated the largest deficits between 1994 and 1997. The electronic machinery sector continued to sustain surpluses of between 4 to 6 percent of total trade from 1992 onwards while the industrial machinery sector continued to sustain deficits representing 5 to 7 percent of total trade over the study period. The transportation sector registered deficits of about 3 percent of total trade.

The above analysis demonstrates that trade is a complex process resulting from differences in endowment, production and consumption patterns. These patterns are dictated by nature, market forces as well as conditioned by the policy environment in which trade, production and consumption occur. Some of Malaysia's trade involve final consumption and capital goods, but the bulk of Malaysia's trade involves intermediate goods used in the production of other goods. Some intermediate goods are imported to enable exports of the final goods using these intermediate inputs. Imports of final goods, like machinery, may be essential for domestic production and domestic use and not so much for exports; nevertheless, these imports contribute to income

generation. In some industries, the degree of internationalization of production and international division of labor is so high as to contain costs such that Malaysia plays only a small part in the production process. Different stages of production have different factor intensities, and fragmentation of the production process is in line with the different relative factor endowments of different countries (see Markusen, 1998). The high *GL* indices in the electronic industries in Malaysia reflect neo-Heckscher Ohlin kind of *IIT* rather than the horizontal kind of *IIT* as characterized by the majority of the North-North trade. The externalities generated in the form of technological spillovers and ability to penetrate other markets as well as the potential for future "upgrading" be it in the structure of production or trade in the electronic sector are difficult to quantify although the immediate domestic value-added in these vertically integrated assembly kind of activities may not be large.

All things considered, the structure of Malaysia's trade does exhibit movement towards that of a developed economy away from the primary sector towards the manufacturing sector and increased integration with the world economy, be it in production, consumption or trade. Integration with other nations opens the door for specialization in particular activities and increased economic efficiency and income, but the price of all this is, of course, interdependence especially with the foreign-dominated investment in the electronic industry and less autonomy in determining the structure of production and trade and the balance of payments. DFI provides employment which generates income and other spillover effects not only at the expense of less autonomy in determining the structure of production and trade but also in the form of outflows of investment income not reinvested domestically, creating an impact on the current account deficit.

Earlier on the policy-induced phenomena of accelerating industrialization *via* export processing zones and licensed manufacturing warehouses (which generated almost tariff-free trade in the export processing zones) resulted in the enclave nature of production in the electric and electronic industry with assembling activities by MNCs flourishing due to cheap unskilled labor (*à la* Heckscher-Ohlin). This sort of policy in Malaysia possibly encouraged imports of intermediate inputs and the creation of foreign linkages at the expense of domestic sourcing and creation of local linkages. Of course, as the name implies, export processing zones encourage exports and contribute to export competitiveness, but whether this export competitiveness is generated by local firms with the ensuing deepening of industrial structure or by MNCs generating exports by importing heavily merits further study. The *GL* indices of greater than 0.7 in the electronic sector with the importance of SITC 776 serve as a signal for further research on the linkages between production and trade in the aforementioned sector. Currently, like other developing countries, also endowed with abundant labor attract multinationals in labor intensive production, Malaysia is forced to move up the technology ladder.

AFTA and Malaysia's multimedia super corridor may interact to induce a changing division of labor but these interactions do not take place in a vacuum.

All developing countries seek to achieve growth mainly based on imitation rather than innovation. But genuine and sustainable growth can only occur through continuous innovation with the requisite quality and quantity of skills. Had Malaysia but learnt the necessary skills and technology and acquired her own production capacity at the micro level, she would have had an added degree of freedom in providing her own intermediate inputs and later on capital equipment and machinery, broadening her indigenous production base, improving the trade balance and, subsequently, the current account position at the macro level. At this juncture, we think that the "optimal" policy for Malaysia would be not only to continue previous policies of attracting DFI in higher value-added activities but also to provide a domestic environment conducive to indigenous technology generation. It is of paramount importance that the incentive system in Malaysia be revamped to ensure "true" learning and not "pseudo" or "apparent" learning to upgrade the indigenous production skills, be it in the agriculture, manufacturing or services sector. This will then augment and upgrade the relative factor endowments of skills in Malaysia *vis-à-vis* other developing countries and, correspondingly, attract DFI in the higher value added activities. The usual presence of externalities in the "learning" business has led to the formulation of policies aimed at minimizing market failure. Previous policy stance like promoting heavy industrialization (which according to Okamoto (1994) did not generate good economic performance) and now the multimedia super corridor, which is knowledge capital intensive, if not geared properly to building a technological base will result in little long-term net benefits to the economy. The inability to learn fast enough will definitely hamper growth in the long-run.

## ENDNOTES

1. See special issue of the *Malaysian Journal of Economic Studies* (1997) on the financial crisis.

2. Latest year for which detailed trade data is available at the time of writing.

3. See Rodas Martini (1998) on the theories of international trade and their application to developing countries.

4. Taking percentages with respect to *TT* for the respective years reduces the effect of price changes since suitable deflators at the 3-digit SITC level is not available to convert trade figures to real values.

5. At the 3-digit level, the trade balance coefficient or net export to total trade ratio, $(X - M)/(X + M)$ can then be obtained as $(1 - GL)$ for net exports and $-(1 - GL)$ for net imports.

6. Okamoto (1994) observed that the worldwide recession of the mid-1980s led to

negative GDP growth rates (-1.1 percent) for Malaysia in 1985 for the first time since Malaysia's independence and that the government dramatically deregulated the rules with respect to DFI in 1986 and admitted 100 percent foreign ownership of capital for companies which exported > 50 percent of their products compared to the 80 percent requirement for exports prior to this which resulted in a massive inflow of foreign capital to Malaysia.

7. Classification of SITC 75 whether as industrial machinery or electronic machinery varies. Appendix Table 1 of Zakariah and Ahmad (1999) categorizes SITC 75 as non-electrical machinery. Appendix Table A1, *GATT Product Categories* as quoted in Hummels and Stern (1994) classifies SITC 75, 76 and 776 as office machines and telecommunications equipment while electrical machinery and apparatus includes SITC 77 minus (776 + 7783). We choose to classify SITC 75 as belonging to the electronic sector.

8. Table 3 shows that SITC 776 was the most important trade contributor in division 77 and SITC 776 consists of intermediate goods.

9. For details on classification by broad economic categories, see United Nations (1989).

10. See Yeats (1991) for commodity processing classification scheme.

11. See Okamoto (1994) and Athukorala and Menon (1998) about the predominance of MNCs in the electric and electronic sector. Specifically, Table 5 of Athukorala and Menon (1996) shows that 85.52 percent of production and 85.09 percent of employment in 1992 in the electronic sector of Malaysia were generated by foreign firms. See Khalifah (1996) about the predominance of intermediate inputs in Malaysia's *IIT*.

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TABLE 1
Malaysia's Matched and Unmatched Trade as a Percentage of Total Trade, 1990 -1997.

| Section | NX 90 | NM 90 | NX-NM 90 | NT 90 | IIT 90 | TT 90 | GL 90 |
|---|---|---|---|---|---|---|---|
| 0 | 1.08 | 1.79 | -0.71 | 2.87 | 2.19 | 5.06 | 0.433 |
| 1 | 0.02 | 0.14 | -0.12 | 0.16 | 0.08 | 0.24 | 0.342 |
| 2 | 6.77 | 1.15 | 5.62 | 7.91 | 0.92 | 8.83 | 0.105 |
| 3 | 8.11 | 1.45 | 6.66 | 9.56 | 2.16 | 11.72 | 0.185 |
| 4 | 3.44 | 0.00 | 3.44 | 3.44 | 0.27 | 3.71 | 0.074 |
| Primary | 19.42 | 4.53 | 14.89 | 23.95 | 5.64 | 29.59 | 0.191 |
| 5 | 0.07 | 3.48 | -3.41 | 3.55 | 1.50 | 5.05 | 0.296 |
| 6 | 1.74 | 5.62 | -3.89 | 7.36 | 4.50 | 11.86 | 0.379 |
| 7 | 4.58 | 11.70 | -7.12 | 16.28 | 26.66 | 42.94 | 0.621 |
| 8 | 3.45 | 1.28 | 2.18 | 4.73 | 3.11 | 7.84 | 0.397 |
| Manufacturing | 9.84 | 22.08 | -12.24 | 31.93 | 35.76 | 67.69 | 0.528 |
| 9 | 0.13 | 2.44 | -2.31 | 2.57 | 0.16 | 2.73 | 0.058 |
| Overall | 29.39 | 29.05 | 0.33 | 58.44 | 41.56 | 100.00 | 0.416 |
| Section | NX 91 | NM 91 | NX-NM 91 | NT 91 | IIT 91 | TT 91 | GL 91 |
| 0 | 0.92 | 1.69 | -0.76 | 2.61 | 1.89 | 4.50 | 0.420 |
| 1 | 0.02 | 0.15 | -0.13 | 0.17 | 0.14 | 0.31 | 0.446 |
| 2 | 5.33 | 1.06 | 4.26 | 6.39 | 0.76 | 7.15 | 0.106 |
| 3 | 6.73 | 1.41 | 5.33 | 8.14 | 1.54 | 9.68 | 0.159 |
| 4 | 2.99 | 0.00 | 2.99 | 2.99 | 0.40 | 3.39 | 0.119 |
| Primary | 15.99 | 4.30 | 11.69 | 20.29 | 4.73 | 25.02 | 0.189 |
| 5 | 0.07 | 3.14 | -3.07 | 3.21 | 1.57 | 4.78 | 0.329 |
| 6 | 1.46 | 5.84 | -4.38 | 7.30 | 4.62 | 11.92 | 0.387 |
| 7 | 4.93 | 12.76 | -7.83 | 17.69 | 29.94 | 47.63 | 0.629 |
| 8 | 3.55 | 1.16 | 2.39 | 4.71 | 3.46 | 8.17 | 0.424 |
| Manufacturing | 10.01 | 22.91 | -12.90 | 32.91 | 39.59 | 72.50 | 0.546 |
| 9 | 0.00 | 2.03 | -2.03 | 2.03 | 0.45 | 2.48 | 0.181 |
| Overall | 26.00 | 29.24 | -3.24 | 55.24 | 44.76 | 100.00 | 0.448 |

TABLE 1 (Continued)

| Section | NX 92 | NM 92 | NX-NM 92 | NT 92 | IIT 92 | TT 92 | GL 92 |
|---|---|---|---|---|---|---|---|
| 0 | 0.83 | 1.66 | -0.83 | 2.49 | 2.01 | 4.50 | 0.446 |
| 1 | 0.02 | 0.12 | -0.10 | 0.14 | 0.14 | 0.28 | 0.501 |
| 2 | 5.04 | 0.90 | 4.14 | 5.94 | 0.76 | 6.70 | 0.114 |
| 3 | 5.73 | 1.26 | 4.47 | 6.99 | 1.62 | 8.61 | 0.189 |
| 4 | 3.19 | 0.00 | 3.19 | 3.19 | 0.32 | 3.51 | 0.091 |
| Primary | 14.81 | 3.94 | 10.87 | 18.75 | 4.86 | 23.61 | 0.206 |
| 5 | 0.13 | 3.07 | -2.94 | 3.20 | 1.82 | 5.02 | 0.362 |
| 6 | 1.71 | 5.33 | -3.63 | 7.04 | 5.19 | 12.23 | 0.425 |
| 7 | 6.09 | 11.12 | -5.02 | 17.21 | 32.09 | 49.30 | 0.651 |
| 8 | 3.84 | 1.09 | 2.75 | 4.93 | 3.54 | 8.47 | 0.418 |
| Manufacturing | 11.77 | 20.61 | -8.84 | 32.38 | 42.64 | 75.02 | 0.568 |
| 9 | 0.00 | 0.92 | -0.92 | 0.92 | 0.45 | 1.37 | 0.327 |
| Overall | 26.58 | 25.48 | 1.10 | 52.06 | 47.94 | 100.00 | 0.479 |
| Section | NX 93 | NM 93 | NX-NM 93 | NT 93 | IIT 93 | TT 93 | GL 93 |
| 0 | 0.75 | 1.52 | -0.77 | 2.27 | 1.84 | 4.11 | 0.448 |
| 1 | 0.02 | 0.11 | -0.09 | 0.13 | 0.12 | 0.25 | 0.479 |
| 2 | 4.21 | 0.97 | 3.23 | 5.18 | 0.79 | 5.97 | 0.132 |
| 3 | 4.45 | 1.00 | 3.45 | 5.45 | 1.55 | 7.00 | 0.222 |
| 4 | 2.87 | 0.00 | 2.87 | 2.87 | 0.34 | 3.21 | 0.105 |
| Primary | 12.29 | 3.60 | 8.69 | 15.89 | 4.63 | 20.52 | 0.226 |
| 5 | 0.15 | 2.75 | -2.60 | 2.90 | 1.91 | 4.81 | 0.397 |
| 6 | 2.10 | 4.66 | -2.56 | 6.75 | 5.53 | 12.28 | 0.450 |
| 7 | 7.41 | 10.20 | -2.78 | 17.61 | 34.45 | 52.06 | 0.662 |
| 8 | 3.56 | 1.04 | 2.52 | 4.60 | 3.38 | 7.98 | 0.424 |
| Manufacturing | 13.22 | 18.64 | -5.43 | 31.86 | 45.27 | 77.13 | 0.587 |
| 9 | 0.00 | 1.65 | -1.65 | 1.65 | 0.69 | 2.34 | 0.294 |
| Overall | 25.51 | 23.90 | 1.61 | 49.41 | 50.59 | 100.00 | 0.506 |

TABLE 1 (Continued)

| Section | NX 94 | NM 94 | NX-NM 94 | NT 94 | IIT 94 | TT 94 | GL 94 |
|---|---|---|---|---|---|---|---|
| 0 | 0.62 | 1.36 | -0.74 | 1.99 | 1.58 | 3.57 | 0.443 |
| 1 | 0.02 | 0.09 | -0.07 | 0.11 | 0.10 | 0.21 | 0.474 |
| 2 | 3.27 | 0.78 | 2.49 | 4.05 | 0.87 | 4.92 | 0.177 |
| 3 | 2.93 | 0.56 | 2.37 | 3.50 | 1.45 | 4.95 | 0.294 |
| 4 | 3.21 | 0.00 | 3.20 | 3.21 | 0.36 | 3.57 | 0.100 |
| Primary | 10.05 | 2.80 | 7.25 | 12.85 | 4.36 | 17.21 | 0.253 |
| 5 | 0.22 | 2.35 | -2.13 | 2.56 | 2.16 | 4.72 | 0.457 |
| 6 | 1.86 | 4.42 | -2.56 | 6.27 | 5.14 | 11.41 | 0.450 |
| 7 | 8.47 | 12.29 | -3.82 | 20.75 | 35.92 | 56.67 | 0.634 |
| 8 | 2.93 | 1.00 | 1.93 | 3.93 | 3.44 | 7.37 | 0.467 |
| Manufacturing | 13.47 | 20.05 | -6.58 | 33.52 | 46.65 | 80.17 | 0.582 |
| 9 | 0.00 | 1.31 | -1.31 | 1.31 | 1.32 | 2.63 | 0.500 |
| Overall | 23.52 | 24.16 | -0.65 | 47.68 | 52.32 | 100.00 | 0.523 |
| Section | NX 95 | NM 95 | NX-NM 95 | NT 95 | IIT 95 | TT 95 | GL 95 |
| 0 | 0.48 | 1.36 | -0.89 | 1.84 | 1.43 | 3.27 | 0.437 |
| 1 | 0.02 | 0.06 | -0.04 | 0.08 | 0.17 | 0.25 | 0.673 |
| 2 | 2.69 | 0.76 | 1.94 | 3.45 | 0.93 | 4.38 | 0.213 |
| 3 | 2.59 | 0.33 | 2.26 | 2.92 | 1.64 | 4.56 | 0.360 |
| 4 | 3.23 | 0.00 | 3.23 | 3.24 | 0.20 | 3.44 | 0.057 |
| Primary | 9.01 | 2.52 | 6.50 | 11.53 | 4.37 | 15.90 | 0.275 |
| 5 | 0.23 | 2.37 | -2.14 | 2.60 | 2.52 | 5.12 | 0.492 |
| 6 | 1.65 | 4.45 | -2.80 | 6.11 | 5.31 | 11.42 | 0.465 |
| 7 | 8.68 | 12.57 | -3.88 | 21.25 | 36.41 | 57.66 | 0.632 |
| 8 | 2.61 | 0.86 | 1.75 | 3.47 | 3.29 | 6.76 | 0.487 |
| Manufacturing | 13.17 | 20.25 | -7.08 | 33.42 | 47.52 | 80.94 | 0.587 |
| 9 | 0.00 | 1.89 | -1.89 | 1.89 | 1.28 | 3.17 | 0.404 |
| Overall | 22.18 | 24.65 | -2.47 | 46.84 | 53.16 | 100.00 | 0.532 |

TABLE 1 (Continued)

| Section | NX 96 | NM 96 | NX-NM 96 | NT 96 | IIT 96 | TT 96 | GL 96 |
|---|---|---|---|---|---|---|---|
| 0 | 0.45 | 1.55 | -1.11 | 2.00 | 1.50 | 3.50 | 0.429 |
| 1 | 0.08 | 0.06 | 0.02 | 0.15 | 0.12 | 0.27 | 0.457 |
| 2 | 2.24 | 0.77 | 1.47 | 3.01 | 0.97 | 3.98 | 0.244 |
| 3 | 3.15 | 0.44 | 2.70 | 3.59 | 1.76 | 5.35 | 0.329 |
| 4 | 2.91 | 0.00 | 2.91 | 2.91 | 0.13 | 3.04 | 0.044 |
| Primary | 8.83 | 2.84 | 5.99 | 11.66 | 4.50 | 16.16 | 0.278 |
| 5 | 0.27 | 2.07 | -1.80 | 2.34 | 2.62 | 4.96 | 0.528 |
| 6 | 2.04 | 4.11 | -2.07 | 6.15 | 5.20 | 11.35 | 0.458 |
| 7 | 9.03 | 11.46 | -2.43 | 20.49 | 37.20 | 57.69 | 0.645 |
| 8 | 2.79 | 0.70 | 2.08 | 3.49 | 3.41 | 6.90 | 0.495 |
| Manufacturing | 14.13 | 18.35 | -4.22 | 32.47 | 48.44 | 80.91 | 0.599 |
| 9 | 0.00 | 1.83 | -1.83 | 1.83 | 1.10 | 2.93 | 0.375 |
| Overall | 22.95 | 23.02 | -0.06 | 45.97 | 54.03 | 100.00 | 0.540 |
| Section | NX 97 | NM 97 | NX-NM 97 | NT 97 | IIT 97 | TT 97 | GL 97 |
| 0 | 0.49 | 1.58 | -1.08 | 2.07 | 1.41 | 3.48 | 0.406 |
| 1 | 0.11 | 0.09 | 0.02 | 0.20 | 0.12 | 0.32 | 0.386 |
| 2 | 1.79 | 0.75 | 1.04 | 2.55 | 0.98 | 3.53 | 0.279 |
| 3 | 3.20 | 0.59 | 2.61 | 3.78 | 1.73 | 5.51 | 0.314 |
| 4 | 2.83 | 0.00 | 2.83 | 2.83 | 0.22 | 3.05 | 0.072 |
| Primary | 8.42 | 3.00 | 5.42 | 11.43 | 4.47 | 15.90 | 0.281 |
| 5 | 0.31 | 2.00 | -1.70 | 2.31 | 2.95 | 5.26 | 0.561 |
| 6 | 2.02 | 4.03 | -2.01 | 6.05 | 4.95 | 11.00 | 0.450 |
| 7 | 8.88 | 10.90 | -2.02 | 19.78 | 38.37 | 58.15 | 0.660 |
| 8 | 2.58 | 0.84 | 1.74 | 3.42 | 3.58 | 7.00 | 0.512 |
| Manufacturing | 13.79 | 17.77 | -3.98 | 31.56 | 49.85 | 81.41 | 0.612 |
| 9 | 0.00 | 1.45 | -1.45 | 1.45 | 1.24 | 2.69 | 0.461 |
| Overall | 22.21 | 22.22 | -0.01 | 44.44 | 55.56 | 100.00 | 0.550 |

**Source:** Computed based on *External Trade Statistics*, Department of Statistics, Malaysia (Government Printers), various issues.

TABLE 2
Malaysia's Matched and Unmatched Trade at the 2-digit Level for SITC 7 as a Percentage of Total Trade, 1990-1997.

| Division | NX 90 | NM 90 | X-M 90 | NT 90 | IIT 90 | TT 90 | GL 90 |
|---|---|---|---|---|---|---|---|
| 71 | 0.01 | 0.71 | -0.70 | 0.72 | 0.50 | 1.22 | 0.408 |
| 72 | 0.00 | 3.04 | -3.04 | 3.04 | 0.48 | 3.51 | 0.136 |
| 73 | 0.00 | 0.72 | -0.72 | 0.72 | 0.07 | 0.78 | 0.088 |
| 74 | 0.00 | 1.71 | -1.71 | 1.71 | 1.23 | 2.94 | 0.419 |
| Industrial | 0.01 | 6.18 | -6.17 | 6.19 | 2.28 | 8.45 | 0.269 |
| 75 | 0.24 | 0.26 | -0.02 | 0.50 | 1.82 | 2.32 | 0.786 |
| 76 | 3.35 | 0.00 | 3.35 | 3.35 | 4.24 | 7.59 | 0.559 |
| 77 | 0.98 | 1.71 | -0.73 | 2.69 | 15.89 | 18.57 | 0.855 |
| Electronic | 4.57 | 1.97 | 2.60 | 6.54 | 21.95 | 28.48 | 0.771 |
| 78 | 0.00 | 1.96 | -1.96 | 1.96 | 0.43 | 2.39 | 0.180 |
| 79 | 0.00 | 1.60 | -1.60 | 1.60 | 2.00 | 3.60 | 0.555 |
| Transport | 0.00 | 3.56 | -3.56 | 3.56 | 2.43 | 5.99 | 0.405 |
| Section 7 | 4.58 | 11.70 | -7.12 | 16.28 | 26.66 | 42.94 | 0.621 |
| Division | NX 91 | NM 91 | X-M 91 | NT 91 | IIT 91 | TT 91 | GL 91 |
| 71 | 0.00 | 1.00 | -1.00 | 1.00 | 0.77 | 1.76 | 0.435 |
| 72 | 0.00 | 3.04 | -3.04 | 3.04 | 0.48 | 3.52 | 0.138 |
| 73 | 0.00 | 0.86 | -0.86 | 0.86 | 0.07 | 0.93 | 0.072 |
| 74 | 0.00 | 2.07 | -2.07 | 2.07 | 1.72 | 3.79 | 0.454 |
| Industrial | 0.00 | 6.97 | -6.97 | 6.97 | 3.04 | 10.00 | 0.304 |
| 75 | 0.71 | 0.21 | 0.50 | 0.93 | 2.47 | 3.40 | 0.728 |
| 76 | 3.87 | 0.55 | 3.32 | 4.42 | 4.69 | 9.11 | 0.515 |
| 77 | 0.35 | 2.03 | -1.68 | 2.38 | 16.38 | 18.76 | 0.873 |
| Electronic | 4.93 | 2.79 | 2.14 | 7.73 | 23.54 | 31.27 | 0.753 |
| 78 | 0.00 | 1.90 | -1.90 | 1.90 | 0.43 | 2.33 | 0.184 |
| 79 | 0.00 | 1.10 | -1.10 | 1.10 | 2.93 | 4.03 | 0.727 |
| Transport | 0.00 | 3.00 | -3.00 | 3.00 | 3.36 | 6.36 | 0.528 |
| Section 7 | 4.93 | 12.76 | -7.83 | 17.69 | 29.94 | 47.63 | 0.629 |

TABLE 2 (Continued)

| Division | NX 92 | NM 92 | X-M 92 | NT 92 | IIT 92 | TT 92 | GL 92 |
|---|---|---|---|---|---|---|---|
| 71 | 0.00 | 0.91 | -0.91 | 0.91 | 0.95 | 1.86 | 0.511 |
| 72 | 0.00 | 2.78 | -2.78 | 2.78 | 0.52 | 3.31 | 0.158 |
| 73 | 0.00 | 0.93 | -0.93 | 0.93 | 0.08 | 1.01 | 0.079 |
| 74 | 0.00 | 2.01 | -2.01 | 2.01 | 1.89 | 3.90 | 0.485 |
| Industrial | 0.00 | 6.63 | -6.63 | 6.63 | 3.44 | 10.08 | 0.342 |
| 75 | 1.43 | 0.00 | 1.43 | 1.43 | 3.03 | 4.46 | 0.680 |
| 76 | 4.27 | 0.04 | 4.23 | 4.30 | 4.77 | 9.07 | 0.526 |
| 77 | 0.40 | 2.06 | -1.66 | 2.46 | 17.10 | 19.57 | 0.874 |
| Electronic | 6.10 | 2.10 | 4.00 | 8.19 | 24.90 | 33.10 | 0.753 |
| 78 | 0.00 | 1.12 | -1.12 | 1.12 | 0.67 | 1.79 | 0.373 |
| 79 | 0.00 | 1.27 | -1.27 | 1.27 | 3.07 | 4.33 | 0.708 |
| Transport | 0.00 | 2.39 | -2.39 | 2.39 | 3.74 | 6.12 | 0.610 |
| Section 7 | 6.09 | 11.12 | -5.03 | 17.21 | 32.09 | 49.30 | 0.651 |

| Division | NX 93 | NM 93 | X-M 93 | NT 93 | IIT 93 | TT 93 | GL 93 |
|---|---|---|---|---|---|---|---|
| 71 | 0.00 | 0.80 | -0.80 | 0.80 | 1.01 | 1.80 | 0.559 |
| 72 | 0.00 | 2.37 | -2.37 | 2.37 | 0.58 | 2.95 | 0.197 |
| 73 | 0.00 | 0.73 | -0.73 | 0.73 | 0.10 | 0.83 | 0.125 |
| 74 | 0.00 | 1.94 | -1.94 | 1.94 | 2.05 | 3.99 | 0.514 |
| Industrial | 0.00 | 5.84 | -5.84 | 5.84 | 3.74 | 9.57 | 0.391 |
| 75 | 2.09 | 0.00 | 2.09 | 2.09 | 2.97 | 5.06 | 0.587 |
| 76 | 5.07 | 0.08 | 4.99 | 5.14 | 5.20 | 10.35 | 0.503 |
| 77 | 0.24 | 2.14 | -1.90 | 2.38 | 19.50 | 21.88 | 0.891 |
| Electronic | 7.40 | 2.22 | 5.18 | 9.61 | 27.67 | 37.29 | 0.742 |
| 78 | 0.02 | 1.05 | -1.03 | 1.07 | 0.79 | 1.86 | 0.425 |
| 79 | 0.00 | 1.09 | -1.09 | 1.09 | 2.25 | 3.34 | 0.673 |
| Transport | 0.02 | 2.14 | -2.12 | 2.16 | 3.04 | 5.20 | 0.585 |
| Section 7 | 7.41 | 10.20 | -2.79 | 17.61 | 34.45 | 52.06 | 0.662 |

TABLE 2 (Continued)

| Division | NX 94 | NM 94 | X-M 94 | NT 94 | IIT 94 | TT 94 | GL 94 |
|---|---|---|---|---|---|---|---|
| 71 | 0.00 | 1.06 | -1.06 | 1.06 | 0.92 | 1.99 | 0.465 |
| 72 | 0.00 | 2.42 | -2.42 | 2.42 | 0.48 | 2.90 | 0.166 |
| 73 | 0.00 | 0.77 | -0.77 | 0.77 | 0.11 | 0.88 | 0.126 |
| 74 | 0.07 | 1.65 | -1.58 | 1.71 | 1.99 | 3.70 | 0.538 |
| Industrial | 0.07 | 5.90 | -5.83 | 5.96 | 3.50 | 9.47 | 0.370 |
| 75 | 2.62 | 0.00 | 2.62 | 2.62 | 3.24 | 5.86 | 0.554 |
| 76 | 5.72 | 0.00 | 5.72 | 5.72 | 5.48 | 11.20 | 0.489 |
| 77 | 0.03 | 3.83 | -3.80 | 3.87 | 19.99 | 23.86 | 0.838 |
| Electronic | 8.37 | 3.83 | 4.54 | 12.21 | 28.71 | 40.92 | 0.702 |
| 78 | 0.03 | 1.20 | -1.17 | 1.23 | 0.59 | 1.82 | 0.325 |
| 79 | 0.00 | 1.35 | -1.35 | 1.35 | 3.11 | 4.46 | 0.698 |
| Transport | 0.03 | 2.55 | -2.52 | 2.58 | 3.70 | 6.28 | 0.590 |
| Section 7 | 8.47 | 12.29 | -3.82 | 20.75 | 35.92 | 56.68 | 0.634 |

| Division | NX 95 | NM 95 | X-M 95 | NT 95 | IIT 95 | TT 95 | GL 95 |
|---|---|---|---|---|---|---|---|
| 71 | 0.00 | 0.94 | -0.94 | 0.94 | 0.87 | 1.81 | 0.479 |
| 72 | 0.00 | 2.71 | -2.71 | 2.71 | 0.56 | 3.27 | 0.172 |
| 73 | 0.00 | 1.07 | -1.07 | 1.07 | 0.12 | 1.19 | 0.100 |
| 74 | 0.19 | 1.37 | -1.18 | 1.56 | 1.81 | 3.37 | 0.537 |
| Industrial | 0.19 | 6.09 | -5.90 | 6.28 | 3.36 | 9.64 | 0.348 |
| 75 | 2.89 | 0.00 | 2.89 | 2.89 | 3.72 | 6.61 | 0.563 |
| 76 | 5.54 | 0.00 | 5.54 | 5.54 | 5.18 | 10.72 | 0.483 |
| 77 | 0.04 | 3.68 | -3.64 | 3.72 | 21.44 | 25.16 | 0.852 |
| Electronic | 8.47 | 3.68 | 4.79 | 12.15 | 30.34 | 42.49 | 0.714 |
| 78 | 0.03 | 1.53 | -1.50 | 1.56 | 0.56 | 2.12 | 0.263 |
| 79 | 0.00 | 1.27 | -1.27 | 1.27 | 2.15 | 3.42 | 0.629 |
| Transport | 0.03 | 2.80 | -2.77 | 2.83 | 2.71 | 5.54 | 0.489 |
| Section 7 | 8.68 | 12.57 | -3.89 | 21.25 | 36.41 | 57.66 | 0.632 |

TABLE 2 (Continued)

| Division | NX 96 | NM 96 | X-M 96 | NT 96 | IIT 96 | TT 96 | GL 96 |
|---|---|---|---|---|---|---|---|
| 71 | 0.00 | 0.80 | -0.80 | 0.80 | 1.01 | 1.81 | 0.557 |
| 72 | 0.00 | 2.49 | -2.49 | 2.49 | 0.73 | 3.22 | 0.227 |
| 73 | 0.00 | 0.68 | -0.68 | 0.68 | 0.13 | 0.81 | 0.161 |
| 74 | 0.20 | 1.60 | -1.40 | 1.80 | 1.52 | 3.32 | 0.458 |
| Industrial | 0.20 | 5.57 | -5.37 | 5.77 | 3.39 | 9.16 | 0.370 |
| 75 | 3.22 | 0.00 | 3.22 | 3.22 | 5.05 | 8.27 | 0.611 |
| 76 | 5.49 | 0.00 | 5.49 | 5.49 | 4.19 | 9.68 | 0.433 |
| 77 | 0.08 | 3.54 | -3.46 | 3.62 | 22.29 | 25.90 | 0.860 |
| Electronic | 8.79 | 3.54 | 5.25 | 12.33 | 31.53 | 43.85 | 0.719 |
| 78 | 0.04 | 1.66 | -1.62 | 1.70 | 0.59 | 2.28 | 0.258 |
| 79 | 0.00 | 0.69 | -0.69 | 0.69 | 1.70 | 2.39 | 0.713 |
| Transport | 0.04 | 2.35 | -2.31 | 2.39 | 2.29 | 4.67 | 0.490 |
| Section 7 | 9.03 | 11.46 | -2.43 | 20.49 | 37.20 | 57.69 | 0.645 |

| Division | NX 97 | NM 97 | X-M 97 | NT 97 | IIT 97 | TT 97 | GL 97 |
|---|---|---|---|---|---|---|---|
| 71 | 0.00 | 0.62 | -0.62 | 0.62 | 0.82 | 1.44 | 0.569 |
| 72 | 0.00 | 2.18 | -2.18 | 2.18 | 0.68 | 2.86 | 0.237 |
| 73 | 0.00 | 0.76 | -0.76 | 0.76 | 0.15 | 0.90 | 0.164 |
| 74 | 0.00 | 1.77 | -1.77 | 1.77 | 1.38 | 3.15 | 0.438 |
| Industrial | 0.00 | 5.33 | -5.33 | 5.33 | 3.03 | 8.35 | 0.362 |
| 75 | 4.09 | 0.00 | 4.09 | 4.09 | 6.15 | 10.24 | 0.601 |
| 76 | 4.65 | 0.00 | 4.65 | 4.65 | 3.97 | 8.62 | 0.461 |
| 77 | 0.10 | 2.67 | -2.57 | 2.77 | 23.04 | 25.81 | 0.893 |
| Electronic | 8.84 | 2.67 | 6.17 | 11.51 | 33.16 | 44.67 | 0.742 |
| 78 | 0.03 | 1.57 | -1.54 | 1.60 | 0.59 | 2.19 | 0.271 |
| 79 | 0.00 | 1.34 | -1.34 | 1.34 | 1.59 | 2.93 | 0.543 |
| Transport | 0.03 | 2.91 | -2.88 | 2.94 | 2.18 | 5.12 | 0.426 |
| Section 7 | 8.88 | 10.90 | -2.02 | 19.78 | 38.37 | 58.15 | 0.660 |

**Source:** Computed by author based on data as quoted in Table 1.

TABLE 3
Malaysia's Top 10 Industries with Largest Unmatched Exports and Unmatched Imports as a Percentage of Exports and Unmatched Imports as a Percentage of Total Trade: 3-Digit Level for All Sectors (1990-1997)

| GROUP | NX 90 | Cum NX 90 | IIT 90 | Cum IIT | GL 90 |
|---|---|---|---|---|---|
| 333 | 6.45 | 6.45 | 0.54 | 0.54 | 0.078 |
| 422 | 2.71 | 9.16 | 0.05 | 0.59 | 0.020 |
| 247 | 2.56 | 11.72 | 0.01 | 0.60 | 0.002 |
| 248 | 2.23 | 13.95 | 0.05 | 0.65 | 0.021 |
| 231 | 1.77 | 15.72 | 0.27 | 0.92 | 0.134 |
| 762 | 1.71 | 17.43 | 0.33 | 1.25 | 0.160 |
| 343 | 1.66 | 19.09 | 0.00 | 1.25 | 0.000 |
| 776 | 0.87 | 19.96 | 12.99 | 14.24 | 0.937 |
| 761 | 0.86 | 20.82 | 0.05 | 14.29 | 0.059 |
| 431 | 0.73 | 21.55 | 0.02 | 14.31 | 0.021 |
| GROUP | NM 90 | Cum NM 90 | IIT 90 | Cum IIT | GL 90 |
| 971 | 2.40 | 2.40 | 0.03 | 0.03 | 0.012 |
| 728 | 1.43 | 3.83 | 0.18 | 0.21 | 0.114 |
| 792 | 1.24 | 5.07 | 0.90 | 1.11 | 0.421 |
| 334 | 1.23 | 6.30 | 1.46 | 2.57 | 0.544 |
| 781 | 1.22 | 7.52 | 0.26 | 2.83 | 0.175 |
| 673 | 1.01 | 8.53 | 0.03 | 2.86 | 0.031 |
| 772 | 0.89 | 9.42 | 1.09 | 3.95 | 0.551 |
| 723 | 0.68 | 10.10 | 0.19 | 4.14 | 0.214 |
| 641 | 0.66 | 10.76 | 0.29 | 4.43 | 0.301 |
| 778 | 0.58 | 11.34 | 0.62 | 5.05 | 0.519 |
| GROUP | NX 92 | Cum NX 92 | IIT 92 | Cum IIT | GL 92 |
| 333 | 4.35 | 4.35 | 0.31 | 0.31 | 0.067 |
| 422 | 2.54 | 6.89 | 0.22 | 0.53 | 0.079 |
| 762 | 2.04 | 8.93 | 0.24 | 0.77 | 0.104 |
| 248 | 1.93 | 10.86 | 0.06 | 0.83 | 0.031 |
| 247 | 1.87 | 12.73 | 0.02 | 0.85 | 0.011 |
| 343 | 1.32 | 14.05 | 0.00 | 0.85 | 0.000 |
| 759 | 1.26 | 15.31 | 2.30 | 3.15 | 0.645 |
| 763 | 1.19 | 16.50 | 0.18 | 3.33 | 0.132 |
| 231 | 1.08 | 17.58 | 0.15 | 3.48 | 0.120 |
| 761 | 1.03 | 18.61 | 0.05 | 3.53 | 0.044 |

TABLE 3 (Continued)

| GROUP | NM 92 | Cum NM 92 | IIT 92 | Cum IIT | GL 92 |
|---|---|---|---|---|---|
| 728 | 1.65 | 1.65 | 0.20 | 0.20 | 0.108 |
| 772 | 1.15 | 2.80 | 1.43 | 1.63 | 0.554 |
| 334 | 1.02 | 3.82 | 1.18 | 2.81 | 0.535 |
| 792 | 0.96 | 4.78 | 1.75 | 4.56 | 0.646 |
| 971 | 0.86 | 5.64 | 0.03 | 4.59 | 0.033 |
| 673 | 0.77 | 6.41 | 0.03 | 4.62 | 0.036 |
| 641 | 0.67 | 7.08 | 0.20 | 4.82 | 0.231 |
| 778 | 0.66 | 7.74 | 0.76 | 5.58 | 0.534 |
| 781 | 0.64 | 8.38 | 0.33 | 5.91 | 0.335 |
| 874 | 0.53 | 8.91 | 0.28 | 6.19 | 0.345 |
| GROUP | NX 94 | Cum NX 94 | IIT 94 | Cum IIT | GL 94 |
| 422 | 2.50 | 2.50 | 0.22 | 0.22 | 0.082 |
| 762 | 2.31 | 4.81 | 0.17 | 0.39 | 0.068 |
| 333 | 2.00 | 6.81 | 0.30 | 0.69 | 0.130 |
| 759 | 1.86 | 8.67 | 2.41 | 3.10 | 0.564 |
| 763 | 1.82 | 10.49 | 0.24 | 3.34 | 0.115 |
| 248 | 1.57 | 12.06 | 0.12 | 3.46 | 0.068 |
| 761 | 1.43 | 13.49 | 0.06 | 3.52 | 0.043 |
| 634 | 1.33 | 14.82 | 0.07 | 3.59 | 0.048 |
| 343 | 0.82 | 15.64 | 0.00 | 3.59 | 0.000 |
| 231 | 0.81 | 16.45 | 0.27 | 3.86 | 0.249 |
| GROUP | NM 94 | Cum NM 94 | IIT 94 | Cum IIT | GL 94 |
| 728 | 1.66 | 1.66 | 0.21 | 0.21 | 0.113 |
| 772 | 1.44 | 3.10 | 1.47 | 1.68 | 0.505 |
| 971 | 1.26 | 4.36 | 0.04 | 1.72 | 0.031 |
| 776 | 1.12 | 5.48 | 16.02 | 17.74 | 0.935 |
| 793 | 0.88 | 6.36 | 0.48 | 18.22 | 0.351 |
| 778 | 0.87 | 7.23 | 0.94 | 19.16 | 0.521 |
| 781 | 0.81 | 8.04 | 0.21 | 19.37 | 0.206 |
| 673 | 0.64 | 8.68 | 0.02 | 19.39 | 0.033 |
| 641 | 0.56 | 9.24 | 0.14 | 19.53 | 0.198 |
| 874 | 0.52 | 9.76 | 0.27 | 19.80 | 0.343 |

TABLE 3 (Continued)

| GROUP | NX 96 | Cum NX 96 | IIT 96 | Cum IIT | GL 96 |
|---|---|---|---|---|---|
| 422 | 2.28 | 2.28 | 0.03 | 0.03 | 0.013 |
| 752 | 1.90 | 4.18 | 1.20 | 1.23 | 0.387 |
| 762 | 1.88 | 6.06 | 0.15 | 1.38 | 0.075 |
| 333 | 1.84 | 7.90 | 0.24 | 1.62 | 0.114 |
| 763 | 1.73 | 9.63 | 0.08 | 1.70 | 0.045 |
| 634 | 1.35 | 10.98 | 0.07 | 1.77 | 0.051 |
| 761 | 1.32 | 12.30 | 0.02 | 1.79 | 0.017 |
| 759 | 1.24 | 13.54 | 3.73 | 5.52 | 0.750 |
| 343 | 1.20 | 14.74 | 0.00 | 5.52 | 0.000 |
| 248 | 0.93 | 15.67 | 0.10 | 5.62 | 0.101 |
| GROUP | NM 96 | Cum NM 96 | IIT 96 | Cum IIT | GL 96 |
| 776 | 1.73 | 1.73 | 18.01 | 18.01 | 0.912 |
| 728 | 1.42 | 3.15 | 0.38 | 18.39 | 0.211 |
| 971 | 1.15 | 4.30 | 0.04 | 18.43 | 0.038 |
| 781 | 0.96 | 5.26 | 0.24 | 18.67 | 0.201 |
| 778 | 0.78 | 6.04 | 0.85 | 19.52 | 0.521 |
| 772 | 0.70 | 6.74 | 2.02 | 21.54 | 0.742 |
| 673 | 0.70 | 7.44 | 0.12 | 21.66 | 0.145 |
| 931 | 0.68 | 8.12 | 1.05 | 22.71 | 0.608 |
| 723 | 0.59 | 8.71 | 0.16 | 22.87 | 0.212 |
| 744 | 0.55 | 9.26 | 0.13 | 23.00 | 0.192 |
| GROUP | NX 97 | Cum NX 97 | IIT 97 | Cum IIT | GL 97 |
| 752 | 2.97 | 2.97 | 1.43 | 1.43 | 0.326 |
| 422 | 2.29 | 5.26 | 0.06 | 1.49 | 0.026 |
| 333 | 1.68 | 6.94 | 0.21 | 1.70 | 0.113 |
| 762 | 1.51 | 8.45 | 0.10 | 1.80 | 0.059 |
| 343 | 1.42 | 9.87 | 0.00 | 1.80 | 0.000 |
| 763 | 1.39 | 11.26 | 0.06 | 1.86 | 0.043 |
| 634 | 1.25 | 12.51 | 0.08 | 1.94 | 0.057 |
| 759 | 1.07 | 13.58 | 4.63 | 6.57 | 0.813 |
| 761 | 1.03 | 14.61 | 0.02 | 6.59 | 0.017 |
| 248 | 0.78 | 15.39 | 0.09 | 6.68 | 0.108 |

TABLE 3 (Continued)

| GROUP | NM 97 | Cum NM 97 | IIT 97 | Cum IIT | GL 97 |
|---|---|---|---|---|---|
| 728 | 1.31 | 1.31 | 0.38 | 0.38 | 0.224 |
| 776 | 1.11 | 2.42 | 18.51 | 18.89 | 0.943 |
| 781 | 0.86 | 3.28 | 0.26 | 19.15 | 0.230 |
| 971 | 0.85 | 4.13 | 0.20 | 19.35 | 0.193 |
| 673 | 0.78 | 4.91 | 0.10 | 19.45 | 0.119 |
| 778 | 0.71 | 5.62 | 0.96 | 20.41 | 0.576 |
| 874 | 0.60 | 6.22 | 0.49 | 20.90 | 0.452 |
| 793 | 0.60 | 6.82 | 0.48 | 21.38 | 0.444 |
| 931 | 0.60 | 7.42 | 1.03 | 22.41 | 0.634 |
| 772 | 0.54 | 7.96 | 2.25 | 24.66 | 0.807 |

**Source:** Computed by author based on data as in Table 1.
**Note:** The tables for the years 1991, 1993, and 1995 can be requested from the author.