

East-Asian Export Growth, Intra-Industry Trade and Adjustment*

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ABSTRACT

This paper investigates the structure East Asian trade flows over the high-growth period of 1970-1996. Data for Korea, Malaysia, Indonesia and the Philippines are analysed, using measures of static intra-industry trade (Grubel-Lloyd index) and of dynamic (marginal) intra-industry trade. Inferences drawn from those results are based on the “smooth adjustment hypothesis”, according to which intra-industry trade expansion entails relatively low factor-market adjustment costs. It is found that, despite the different development levels of the four sample countries, static as well as marginal IIT in each case has grown steadily over the period of the study. The changing structure of East Asian trade patterns thus indicates that less labour adjustment pressures are being experienced over time, both domestically and by partners. This tendency is more pronounced in intra-East Asian trade than in trade with the United States and the European Union.

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INTRODUCTION

The extraordinary expansion of exports over the period of the 1970s up to the mid-1990s by a steadily widening group of East Asian countries has prompted mixed reactions by policy makers and economists in industrialised countries.¹ On the one hand, the success of export-led growth strategies was perceived by many as a vindication of western economic orthodoxy and of the market-oriented development policies advocated by the Bretton Woods institutions. On the other hand, most East Asian economies were also characterised by highly concentrated firm structures and interventionist industrial policies, and did not therefore fit neatly into the free-market paradigm.

At a more practical level, the emergence of East Asian exporters raised anxieties in industrialised countries, fearful of the “giant sucking sound” of jobs being lost to low-wage competitors. Even economists who accept that international specialisation along comparative advantage is a positive-sum game have to acknowledge that changes in specialisation entail at least transitional adjustment costs and produce losers as well as gainers. Blue-collar workers in industrialised countries are often identified as the main losers from East Asian export expansion. Competition from emerging economies is seen either as contributing to the widening gap between skilled and unskilled wages, as in the United States, or as fuelling unemployment of unskilled workers in countries where union power and labour legislation impede US-style flexibility of wages. In contrast to populist rhetoric, a majority of empirical analyses have found that trade liberalisation

accounts for some of the fall in demand for blue-collar workers in developed countries, but that the contribution of trade is small and by far the bigger culprit is trade-independent technological change (for a survey, see Freeman, 1995). However, a re-assessment of the trade-employment link in the 1990s, which accounts for different production technologies across countries and estimates “defensive innovation” by incumbent firms, has led to an upward revision of the estimate of trade effects (see Wood, 1994). It must be noted that the emerging *empirical* consensus about the significance of trade liberalisation for US and EU labour-market adjustment is superseded by even stronger *normative* agreement that a return to protectionism would be detrimental (see Wood, 1995; and Sachs and Shatz, 1996).

The adjustment implications of East-Asian trade expansion are thus clearly important. One widely used empirical method to assess the adjustment implications of trade expansion is to analyse patterns of intra-industry trade (IIT). A popular and intuitively appealing hypothesis states that a high share of IIT will be associated with relatively low labour-market disruption. With intra-industry adjustment, workers move within industries rather than between them, which is likely to entail lower adjustment costs. The OECD Jobs Study (OECD, 1994), for instance, found that trade patterns of most East Asian economies still exhibit relatively low shares of IIT, but that these IIT shares show consistently increasing trends, and that related adjustment costs in the industrialised countries are therefore likely to decrease over time.²

Two developments of the IIT literature in the 1990s have cast a degree of doubt over the

standard hypothesis that high and growing IIT is associated with low adjustment costs. One development was the analysis of trade flows in terms of product quality, inferred from unit values. A distinction between *vertical and horizontal IIT* was proposed, where the former relates to two-way trade in goods of different quality and the latter stands for two-way trade in goods of similar quality (Greenaway, Hine and Milner, 1995). Empirical studies found that the bulk of IIT is in vertically differentiated goods, hence adjustment pressures with IIT might be larger than conventionally assumed (see, e.g., Fontagné, Freudenberg and Péridy, 1997). A second recent development in the analysis of IIT was more immediately concerned with the issue of adjustment. Hamilton and Kniest (1991) have argued that traditional static measures of IIT are not inherently related to changes in trade and specialisation. Adjustment, however, arises in production changes over time, and is therefore a dynamic phenomenon. Addressing this shortcoming of the traditional IIT index, a alternative measures of *marginal IIT* were developed, and there is growing evidence that these measures relate to adjustment much more directly than the static indices (see Brülhart, Murphy and Strobl, 1998).

This paper analyses the evolution of trade patterns of four East Asian countries at different stages of development: Korea, Malaysia, Indonesia and the Philippines over the period 1970-1994. The focus is on patterns of IIT and implications for adjustment. In Section 2, we review the intellectual background to the IIT-adjustment hypothesis, with a particular focus on marginal IIT. Section 3 provides a descriptive summary of trade developments in our four sample countries and detail and discussion of patterns of IIT and marginal IIT. Section 4 concludes.

INTRA-INDUSTRY TRADE AND ADJUSTMENT: CONCEPTS AND THEORY

The Hypothesis of IIT and Smooth Adjustment

The proposition that IIT entails lower costs of factor-market adjustment than inter-industry trade, originally suggested by Balassa (1966), has become widely accepted in international economics. However, this much-quoted hypothesis has been subjected to little formal scrutiny, both in the theoretical and in the empirical literature.

One consequence of the lack of formal analysis is that the precise meaning of the IIT-adjustment hypothesis has never been rigorously stated, and the two variables, trade-induced adjustment costs and IIT, have been subject to differing implicit interpretations. We therefore briefly elucidate the key components: trade as an exogenous variable, adjustment costs, and IIT.

There are two conceptions of *trade as a source of adjustment*. In partial-equilibrium, small open economy (SOE) models adjustment is traditionally analysed by departing from a change in world market prices. Such price changes are exogenous to the SOE, and can originate in a multitude of sources, such as changes in demand, factor endowments or trade policies of trading partners. These changes can be labelled “trade-induced”, since they would not affect the SOE in autarky. The second concept of trade as a source of adjustment centres on changes in trade costs, holding everything else constant in multi-country general-equilibrium models. Under that definition, “trade-induced” means sparked by a change in the level of barriers to international trade.

In a nutshell, domestic adjustment is trade-induced either if caused by a reduction in trade barriers, holding everything else constant; or if caused by any relevant changes in foreign markets, holding trade costs constant (i.e. zero).³

Adjustment costs can also be grouped into two categories. First, they can arise in perfectly competitive markets with flexible prices. If factors are subject to any degree of heterogeneity and product specificity, then trade-induced re-allocation will inevitably divert resources to make the transition possible. Hence, production will occur inside the long-run production possibility frontier for the duration of adjustment, as resources are used to re-train, move and match labour, and to adapt the capital stock. Temporary factor-price disparities are needed to incite resource use on such “adjustment services”. When arising from a fall in the relative price of importables (e.g., through trade liberalisation), adjustment costs of this nature do not lead to an aggregate welfare loss, and their impact is purely distributional.⁴ In theory, lump-sum transfers can be designed so as to compensate all individuals for transitional income losses.⁵ In practice, however, transitional wage and income disparities often go uncompensated, thus producing net losers and feeding protectionist pressures.

The second class of adjustment costs arises in the presence of market imperfections. The most commonly analysed imperfection is that of downwardly rigid nominal wages. Under such a configuration, adjustment costs might outweigh the gains from trade, hence trade liberalisation might be Pareto inferior.⁶ The cost-benefit balance depends on the magnitude of adjustment costs and trade gains as well as on the social discount rate.

Turning to the definition of *IIT*, the key concepts are straightforward. The standard measure of IIT is the Grubel-Lloyd (GL) index:

$$GL_t = \left(1 - \frac{|M - X|}{(M + X)} \right)_t \quad (1)$$

where M stands for imports in a particular industry, X represents corresponding exports and t is the reference year. The value of this index ranges between 0 and 1, inclusive. The former value indicates that all trade is of the inter-industry type, the latter that all trade is IIT. It has become standard practice not to adjust the index for overall trade imbalance, since an unbalanced trade account can well be compatible with overall balance of payments equilibrium. A comprehensive survey of this and related issues with relevance to the interpretation of GL indices can be found in Greenaway and Milner (1986). The GL coefficient leaves room for at least two interpretations of IIT in the adjustment context. IIT could refer to either the GL index at the start or end of the relevant period (GL_t), or to the growth of the GL index over that period (ΔGL).

The GL index is a static measure, in the sense that it captures IIT for one particular year. However, adjustment is a dynamic phenomenon. By suggesting the concept of marginal IIT (MIIT), Hamilton and Kniest (1991) have opened a dimension to the empirical study of IIT which for the first time acknowledged this problem and endeavoured to define IIT in a sense that is compatible with the smooth-adjustment hypothesis. They argued that the observation of a high proportion of IIT in one particular time period does not justify *a priori* any prediction of the likely pattern of *change* in trade flows. Even an observed

increase in static IIT levels between two periods (positive ΔGL) could “hide” a very uneven change in trade flows, concomitant with *inter-* rather than *intra-*industry adjustment.

Brühlhart (1994) has suggested the following index to measure MIIT:⁷

$$A = 1 - \frac{|\Delta X - \Delta M|}{|\Delta X| + |\Delta M|}, \quad (2)$$

where Δ stands for the difference between years t and $t-n$. This index, like the GL coefficient, varies between 0 and 1, where 0 indicates marginal trade in the particular industry to be completely of the *inter-*industry type, and 1 represents marginal trade to be entirely of the *intra-*industry type. The A index shares most of the statistical properties of the GL index.⁸

Theoretical Underpinnings

Adjustment affects all production factors. The analysis of IIT has been implicitly concerned with adjustment in the labour market. The most accessible theoretical framework for a discussion of adjustment issues is the specific-factors model, which was expounded concisely by Neary (1985). This model assumes a small open economy which produces and consumes an exportable and an importable good facing perfect competition in all markets and given world prices. Labour can move between the two sectors (but not between countries), all other factors are fixed (the “specific” factors), and there are diminishing returns to factor inputs. Imagine an export boom, which is equivalent to a fall in the relative demand for importables, triggered by some measure of

trade liberalisation. If adjustment were perfectly smooth, the economy would instantly attain a new equilibrium where the unique economy-wide wage in terms of the exportable has fallen, and some workers have switched employment from the contracting import sector to the expanding export sector. In reality, this transition is likely to be costly. As discussed above, these costs can take the form of “adjustment services” to adapt labour and/or of temporary unemployment in the presence of sticky wages.

We can formulate the IIT-adjustment hypothesis in terms of the specific-factors model. According to the IIT literature, adjustment is smoother in terms of “adjustment services” and unemployment if the expanding and contracting activities are contained within the same industry, than if they represent two different industries. This hypothesis implicitly makes at least one of the following two assumptions:

1. the adaptability of labour is greater within industries than between industries, *ceteris paribus*, or
2. relative wages are more flexible within industries than between industries, *ceteris paribus*.

The first justification for the expectation of smooth intra-industry adjustment has great intuitive appeal. If we define IIT as the exchange of goods with similar production requirements, it is implied that labour requirements are more similar within than between industries. If the skills acquired by the workers and managers of a contracting firm can be applied without much re-training in an expanding firm of the same industry,

then labour mobility may well be higher within industries than between them. Where IIT reflects intra-firm trade, workers can simply be transferred from one department to another.

The second hypothesis seems less plausible. The main impediments to wage flexibility are minimum-wage legislation and contractual wage agreements between labour market institutions. Since such constraints generally apply at the level of the entire economy or of individual industries, they might actually be expected to allow greater wage flexibility between industries than within them. If temporary wage inflexibility through industry-wide centralised bargaining is the dominant cause of adjustment problems, then adjustment costs would be greater when trade shocks are intra-industry than when trade alters the relative positions between industries.

Ultimately, the homogeneity and adaptability of industries, as defined in trade statistics, can only be determined through empirical investigation. Due to the difficulty of obtaining appropriate data, the smooth-adjustment hypothesis has been subjected to few empirical tests. There is increasing evidence, however, that MIIT, but not IIT in the static sense, relates negatively to adjustment costs (see Brülhart and Hine, 1997; Brülhart *et al.*, 1998).

EAST-ASIAN TRADE PATTERNS: A BALANCED EXPANSION?

Trade Growth 1970-96

Until the onset of the recent economic downturn which commenced in mid-1997, the preceding three decades witnessed an unprecedented pace of growth and industrialisation in a number of East Asian countries (Table 1). A small group of first-tier newly industrialised economies, the so-called ‘tiger’ economies of Hong Kong, Singapore, the Republic of Korea (Korea) and Taiwan, grew at an average annual rate of around 7 per cent over this period. A second tier of economies, including Thailand, Malaysia, Indonesia and, more recently, China followed closely behind, having begun their rapid growth phase a decade or so later, during the 1970s. The recent performance of a further group of countries, which comprises the Philippines and transitional economies such as Vietnam, suggests the emergence of a third tier.⁹

Four countries are studied in this paper, selected as a representative sample of economies at varying stages in the process of industrial development. The period of analysis is 1970-1996 and the countries are Korea, Malaysia, Indonesia and the Philippines. A common feature of these economies, and central to their industrialisation, has been the increasing importance of exports (Table 2). Import growth in intermediate and capital goods, as well as final consumption goods, has generally been an important complement to the expansion of exports. This expansion in trade was accompanied by a changing commodity composition of trade and a geographical shift in trade flows as development proceeded. Table 3 shows that in 1996 all four sample countries conducted the bulk of their trade with East Asian neighbours (including Japan) over the period.

Beyond this, however, not much generalisation is possible. Of the two large industrialised trade blocks, the US and the EU, the US is the bigger trading partner for Korea, Malaysia and the Philippines, whereas Indonesia conducts more trade with the EU than with the US. In a detailed analysis of the evolving country and commodity composition of East Asian trade flows, Noland (1997) has refuted the notion of a typically Asian trade structure. He uncovered significant diversity in the specialisation patterns of Asian countries. The selection of our country sample was guided by these findings. Korea is part of the second wave of trade-expanding countries, after Japan.¹⁰ Malaysia, together with Thailand, was considered part of a third wave of “Asian tigers” which was emerging over the period. Finally, both Indonesia and the Philippines would have to be attributed to a fourth category on the basis of their per-capita incomes. However, Tables 1 and 2 show that income and trade growth between 1970 and 1996 were both much stronger in Indonesia than in the Philippines.

Korea's export take-off began in the 1960s with labour intensive manufactures, in particular textiles, clothing and footwear, underpinning the success. The period of the 1970s through to the early 1980s saw a concerted drive by the Korean government to establish heavy and chemical industries. Export industries which were successfully targeted included electronics, machinery and shipbuilding. Imports of capital goods to support this industrialisation programme also grew strongly at this time, one result being a deterioration in the trade account. A reduction in support for strategic industries during the 1980s has seen a broadening of Korea's export base into skill intensive and high technology manufactured goods. These have included chemical and pharmaceutical

products, computer, scientific and office equipment and semiconductors. Imports, meanwhile, have tended to follow a similar trend. This development has been accompanied by a relative decline in the importance of trade, albeit in a strongly growing economy, and a winding back of the trade deficit (Table 2).

Malaysia, has become a very open economy by world standards. In 1996, exports and imports were each equivalent to almost 80 per cent of GDP in value terms (Table 2). A slight downturn in trade in the mid-1980s coincided with a short-lived attempt to pursue a heavy industry policy, but a boost in foreign direct investment during the latter part of the decade contributed to a surge in exports, together with an even greater rise in the level of imports. The early dependence by Malaysia on the export of simple resource-based manufactures (including food, wood, cork, and rubber products) declined from the 1970s to the mid-1980s, as labour and capital intensive resource-based industries developed in areas such as textiles, clothing, electronics and petroleum products. This development occurred more slowly than in first-tier countries because of the relative abundance of natural resources. Following that period there was an expansion of exports in electrical and mechanical machinery, telecommunications equipment, semiconductors, chemicals and pharmaceuticals. Malaysia's high levels of imports and exports of intermediate goods at the end of the period suggested that many products were being re-exported after processing. High levels of imported capital goods, as well as parts and components, were also necessary because of the lack of a strong local domestic industry in these areas.

In *Indonesia*, export orientation rose dramatically through the 1970s, due to rising oil and petroleum revenues stemming from the hike in oil prices at this time. Although the ratio of exports to GDP has remained relatively constant since the decline in oil prices in the mid-1980s, the composition of exports has changed significantly. Trade reforms and an export promotion policy in the late 1980s contributed to increased manufacturing exports, initially in textiles and plywood products, but later in clothing, footwear, electronic equipment and chemicals. Exports of petroleum-related products continued to be important throughout the period, however. Imports also increased dramatically, mainly in chemicals and machinery (where exports are very low), but remained a relatively small share of output compared to first and second-tier economies in the region.

The trade exposure of the *Philippines'* economy remained broadly stable between 1970 and the mid-1980s. A change in the commodity composition of exports did occur, however, with a significant decline in the relative importance of resource-based exports such as coconut oil, lumber and foodstuffs, and export expansion in areas such as clothing, footwear and electrical machinery, chemicals, furniture and handicrafts. A general decline in trade associated with economic and political crisis in the early 1980s was followed by a resumption of economic growth towards the end of the decade. However, another economic downturn occurred in the early 1990s, combined with continuing and expanding trade deficits.¹¹

Intra-Industry Trade

The United Nations Council for Trade and Development (UNCTAD, 1996) noted how the greater export orientation in East Asian economies was accompanied by significant structural change. The first-tier group of countries, which tend to be relatively natural-resource poor, moved quickly out of primary resource based production and exports in the 1960s into labour intensive and then to skill and technology intensive manufacturing. The resource rich, second-tier group moved more slowly during the 1970s and 1980s along this development path, with initially a greater reliance on processing of natural-resource based products, including wood, paper, rubber and food. The importing of capital goods and intermediate goods was an important feature of all these economies, with many exports from second-tier countries, in particular, having a large import content.

These developments would be expected to have created significant pressures for adjustment in domestic economies in East Asia as well as developed economies in Europe and the United States. To the extent that trade expansion has been (M)IIT in nature it would seem likely that the pressures would be less.

Table 4 reports the summary *Grubel-Lloyd indices* for our sample countries. These indices are calculated from SITC 3-digit trade data. 3-digit sectors correspond to the standard definition of an “industry” in the IIT literature (see Greenaway and Milner, 1986). Our results document the remarkably consistent upward trend in IIT in each country. Between 1970 and 1996, the aggregate GL index for manufacturing products (SITC 5-8) grew from 0.19 to 0.58 in Korea, from 0.13 to 0.61 in Malaysia, from 0.02 to

0.30 in Indonesia and from 0.06 to 0.55 in the Philippines. The sectoral composition of imports and exports has therefore become substantially more similar over time in all these countries. Korea and Malaysia traditionally displayed higher IIT shares than Indonesia and the Philippines. However, trade patterns of the Philippines have exhibited a remarkable surge in IIT during the early 1990s, so that Indonesia now remains the only country in our sample with significantly below-average aggregate IIT levels.

GL indices are reported separately for the major trading partners (US, EU and East Asian neighbours) in Table 5. We find that a generally rising trend in IIT is evident in trade relations with each of the major groups of partners. IIT levels are highest in trade among East Asian neighbours. This is expected, given that geographical distance has a well documented attenuating effect on IIT levels.¹² All sample countries also exhibit higher shares of IIT in trade with the US than in trade with the EU. This might be suggestive of greater adjustment pressures and potential for conflict in the EU than in the US.

Our results on IIT confirm conventional wisdom: East Asian IIT is growing steadily and consistently, starting from a lower base in the less industrialised countries. However, we have shown in Section 2 that inferences from static IIT measures on adjustment might be misplaced. Table 6 therefore reports aggregate measures of MIIT, calculated with the *A* index.

Looking at trade in manufactured products (SITC 5-8), we find that MIIT, like IIT,

displays a generally increasing tendency. Between the 1970-80 and the 1990-96 periods, the *A* index rose from 0.35 to 0.39 in Korea, from 0.47 to 0.59 in Malaysia, from 0.08 to 0.19 in Indonesia and from 0.21 to 0.42 in the Philippines. Table 7 shows that the upward trend in MIIT applies to trade with both the EU and the US. This result supports the notion that the composition of East Asian trade flows is changing in a way which gives rise to decreasing inter-industry adjustment pressures. Our MIIT measures also resemble our findings on IIT in that they are significantly higher for Korea and Malaysia than for Indonesia and the Philippines. More industrialised countries evidently have more evenly distributed trade growth across sectors than countries at the take-off stage, where export growth tends to be concentrated in a narrow group of industries, which are distinct from the sectors where imports grow most. These results support, using the more appropriate dynamic IIT measure, previous conjectures on declining adjustment costs which were based on trends in static IIT measures. The positive correlation between trends in IIT and in MIIT is not the result of some inherent mathematical correspondence between the two measures, hence this finding has real economic significance.

Two additional features of our MIIT results are noteworthy. First, the *A* index for Korea shows not a monotonic increase over our sample period, but an initial rise followed by a decline. The aggregate index peaked at 0.46 in the 1985-90 period, falling back to 0.39 in 1990-96; and the index for manufactured trade reached its maximum at 0.55 in 1985-90, followed by a sharp decline to 0.36 in 1990-96. This evolution of MIIT warrants further examination. It is impossible to hypothesise on what might have caused the

apparent re-emergence of more sectorally concentrated export and import growth. However, if the Korean experience is representative for trade changes of countries at that level of industrialisation, then our inference from observed MIIT increases on decreasing adjustment pressures might be too optimistic.

Second, we find that MIIT, like IIT, is higher for intra-East Asian trade than for trade with the US or the EU in most instances. It therefore appears that trade expansion among East-Asian countries was more sectorally balanced than trade expansion between East Asia and the US or EU over the period. While this result cannot be used as an argument to favour regional integration rather than non-discriminatory trade liberalisation, it highlights one aspect of the beneficial nature of closer regional trading links, namely that the forces of inter-industry specialisation and concomitant adjustment costs are less pronounced among similarly endowed and proximate countries than among distant countries with highly different endowments and tastes.¹³

CONCLUSIONS

This study addresses the question of labour market adjustment in the face of the expansion of trade in East Asian economies over the high-growth period of 1970 – 1996. The trade patterns of four countries in East Asia, Korea, Malaysia, Indonesia and the Philippines are analysed.

Traditional trade theory with its attention to inter-industry trade focuses on the structural change and distributional impacts of increased trade where there are both winners and losers within trading nations. This paper develops the proposition that trade expansion which is intra-industry in nature will entail relatively lower factor-market adjustment costs (the “smooth adjustment hypothesis”).

A measure of marginal IIT is expounded alongside the traditional static Grubel-Lloyd index and is argued to be negatively related to adjustment costs. Results presented here for the four sample economies suggest that, despite their different development levels, static IIT in each case has grown steadily over the period of the study, particularly in manufactured goods trade. The same is found to be the case for marginal IIT. This trend is also generally evident in the sample countries’ trade with each of their major trading partners. Thus, the changing structure and composition of the trade flows of these economies indicates that less labour adjustment pressures are being experienced, both domestically and by partners. There is evidence that this tendency is more pronounced in intra-East Asian trade than in trade with the United States and the European Union.

TABLE 1
The Asian Growth Take-Off
(Real GDP growth, percent per annum)

	1970-80	1980-90	1990-96
<i>KOREA</i>	9.6	9.4	7.2
<i>MALAYSIA</i>	7.9	5.2	8.7
<i>INDONESIA</i>	7.2	6.1	7.8
<i>PHILIPPINES</i>	6.0	1.0	3.3
HONG KONG	9.2	6.9	5.3
SINGAPORE	8.3	6.4	8.5
THAILAND	7.2	7.6	8.0
JAPAN	4.3	4.1	1.4
CHINA	5.5	10.2	11.9
VIETNAM	n.a.	n.a.	8.6

Source: World Bank (World Development Report, various years)

TABLE 2
Trade Performance of the Four Sample Countries, 1970-96

	Trade as percent of GDP				
	1970	1980	1985	1990	1996
KOREA					
Exports	9.3	30.4	33.3	25.9	27.7
Imports	22.3	38.7	34.3	27.8	31.3
Balance	-14.0	-8.3	-1.0	-1.9	-3.6
MALAYSIA					
Exports	40.1	53.7	48.9	68.7	79.3
Imports	33.3	44.5	39.2	64.9	78.2
Balance	7.0	9.2	9.7	3.8	1.1
INDONESIA					
Exports	10.8	30.2	21.6	24.8	22.1
Imports	10.5	14.9	11.9	21.2	19.0
Balance	0.3	15.3	9.7	3.6	3.0
PHILIPPINES					
Exports	15.8	16.5	15.3	21.0	26.2
Imports	18.0	23.8	18.1	33.9	42.3
Balance	-2.2	-7.3	-2.8	-12.9	-16.1

Source: World Bank Trade Statistics

TABLE 3**Trade Shares by Major Trading Partners*****(Percent of total trade)**

	1970		1996	
	Exports	Imports	Exports	Imports
KOREA				
United States	47.0	29.5	16.2	22.0
EU	7.9	10.5	10.6	12.7
East Asia	34.4	50.5	37.2	30.7
MALAYSIA				
United States	13.0	8.6	18.1	15.6
EU	20.3	23.4	13.2	13.4
East Asia	50.2	49.6	54.0	56.0
INDONESIA				
United States	14.0	26.6	13.5	11.7
EU	16.3	21.1	14.8	18.2
East Asia	62.7	41.7	53.0	41.6
PHILIPPINE				
S				
United States	41.7	29.3	32.0	17.8
EU	8.6	16.3	16.4	9.5
East Asia	46.6	37.9	39.2	44.6

- EU refers to the group of 12 members
- Source: IEDB Data Base

TABLE 4**Total Intra-Industry Trade of the Four Sample Countries, 1970-96****(unadjusted Grubel-Lloyd indices, 3-digit SITC level)**

	1970		1980		1985		1990		1996	
<i>SITC</i>	<i>0-8</i>	<i>5-8</i>	<i>0-8</i>	<i>5-8</i>	<i>0-8</i>	<i>5-8</i>	<i>0-8</i>	<i>5-8</i>	<i>0-8</i>	<i>5-8</i>
Korea	0.15	0.19	0.29	0.40	0.41	0.49	0.42	0.48	0.52	0.58
Malaysia	0.19	0.13	0.30	0.38	0.37	0.52	0.46	0.57	0.56	0.61
Indonesia	0.05	0.02	0.14	0.08	0.15	0.11	0.21	0.19	0.29	0.30
Philippines	0.07	0.06	0.13	0.16	0.19	0.29	0.27	0.30	0.50	0.55

TABLE 5

**IIT of the Four Sample Countries by Major Trade Partner, 1970-96
(unadjusted Grubel-Lloyd indices, 3-digit SITC level)**

<i>SITC</i>	1970		1980		1985		1990		1996	
	<i>0-8</i>	<i>5-8</i>	<i>0-8</i>	<i>5-8</i>	<i>0-8</i>	<i>5-8</i>	<i>0-8</i>	<i>5-8</i>	<i>0-8</i>	<i>5-8</i>
KOREA										
United States	0.09	0.16	0.20	0.27	0.27	0.30	0.32	0.37	0.46	0.52
EU	0.06	0.06	0.26	0.27	0.44	0.45	0.29	0.30	0.40	0.41
East Asia	0.15	0.18	0.39	0.46	0.48	0.56	0.54	0.58	0.61	0.65
World	0.15	0.19	0.29	0.40	0.41	0.49	0.42	0.48	0.52	0.58
MALAYSIA										
United States	0.01	0.01	0.37	0.57	0.53	0.67	0.49	0.53	0.53	0.56
EU	0.02	0.02	0.15	0.21	0.20	0.26	0.28	0.34	0.44	0.48
East Asia	0.27	0.22	0.19	0.31	0.26	0.43	0.45	0.59	0.60	0.66
World	0.19	0.13	0.30	0.38	0.37	0.52	0.46	0.57	0.56	0.61
INDONESIA										
United States	0.00	0.00	0.02	0.01	0.02	0.02	0.06	0.07	0.18	0.22
EU	0.03	0.04	0.03	0.03	0.04	0.03	0.08	0.07	0.15	0.14
East Asia	0.03	0.02	0.10	0.08	0.10	0.13	0.17	0.20	0.28	0.33
World	0.05	0.02	0.14	0.08	0.15	0.11	0.21	0.19	0.29	0.30
PHILIPPINES										
United States	0.04	0.04	0.06	0.08	0.18	0.30	0.20	0.24	0.49	0.54
EU	0.02	0.02	0.06	0.08	0.11	0.17	0.16	0.20	0.35	0.38
East Asia	0.05	0.06	0.13	0.22	0.19	0.30	0.27	0.29	0.55	0.56
World	0.07	0.06	0.13	0.16	0.19	0.29	0.27	0.30	0.50	0.55

TABLE 6
Total Marginal IIT of the Four Sample Countries, 1970-96
(A indices, 3-digit SITC level)

	1970-80		1980-85		1985-90		1990-96	
<i>SITC</i>	<i>0-8</i>	<i>5-8</i>	<i>0-8</i>	<i>5-8</i>	<i>0-8</i>	<i>5-8</i>	<i>0-8</i>	<i>5-8</i>
Korea	0.25	0.35	0.44	0.50	0.46	0.55	0.36	0.39
Malaysia	0.31	0.47	0.33	0.47	0.54	0.51	0.53	0.59
Indonesia	0.16	0.08	0.08	0.05	0.19	0.18	0.19	0.20
Philippine	0.13	0.21	0.12	0.13	0.25	0.32	0.35	0.42

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TABLE 7

Marginal IIT by Major Trade Partners, 1970-96
(A indices, 3digit SITC level)

<i>SITC</i>	1970-1980		1980-1985		1985-1990		1990-1996	
	0-8	5-8	0-8	5-8	0-8	5-8	0-8	5-8
KOREA								
United States	0.19	0.24	0.28	0.30	0.29	0.35	0.22	0.25
EU	0.24	0.24	0.49	0.52	0.39	0.41	0.21	0.23
East Asia	0.36	0.42	0.32	0.45	0.50	0.58	0.43	0.46
World	0.25	0.35	0.44	0.50	0.46	0.55	0.36	0.39
MALAYSIA								
United States	0.42	0.64	0.21	0.32	0.38	0.42	0.44	0.46
EU	0.20	0.28	0.15	0.20	0.26	0.29	0.40	0.42
East Asia	0.15	0.33	0.26	0.37	0.53	0.59	0.54	0.62
World	0.31	0.47	0.33	0.47	0.48	0.54	0.53	0.59
INDONESIA								
United States	0.01	0.01	0.01	0.01	0.04	0.07	0.10	0.13
EU	0.02	0.03	0.03	0.03	0.08	0.08	0.11	0.11
East Asia	0.11	0.08	0.08	0.05	0.21	0.19	0.17	0.25
World	0.16	0.08	0.08	0.05	0.19	0.19	0.19	0.20
PHILIPPINES								
United States	0.06	0.10	0.11	0.16	0.14	0.17	0.36	0.44
EU	0.05	0.07	0.05	0.07	0.16	0.19	0.28	0.33
East Asia	0.12	0.28	0.06	0.11	0.19	0.22	0.33	0.40
World	0.13	0.21	0.12	0.13	0.26	0.25	0.35	0.42

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¹ In this paper East Asia refers to the following countries: Japan, Republic of Korea (Korea), Taiwan, Hong Kong, Singapore, Malaysia, Thailand, the Philippines and Indonesia.

² Other studies of East Asian IIT patterns include Brülhart and Thorpe (1999), Drysdale and Garnaut (1993); Grant, Papadakis and Richardson (1993); Khalifah (1995, 1996); Lincoln (1990); Menon (1996, 1997); Noland (1990); OECD (1994); Rajan (1996); and Thorpe (1997).

³ Real economies, of course, are subject to continuous changes in demand and production structures. Therefore, trade liberalisation occurs simultaneously with other changes, and the two types of trade-induced adjustment, while separable in theory, are difficult to disentangle empirically.

⁴ see Baldwin *et al.* (1980, p. 408).

⁵ see Feenstra and Lewis (1994, p. 202). Dixit and Norman (1986) have proposed an incentive-compatible taxation scheme which ensures Pareto gains.

⁶ see Baldwin *et al.* (1980, p. 408ff.). Brecher and Choudhri (1994) have formalised this proposition in an efficiency-wage model.

⁷ Hamilton and Kniest (1991), Greenaway *et al.* (1994) Menon and Dixon (1997) and Thom and McDowell (1999) have proposed alternative measures of MIIT.

⁸ Oliveras and Terra (1996) have shown that the statistical properties of the *A* index differ from those of the GL index in two respects. First, the *A* index is not subject to an growing downward bias as the level of statistical disaggregation is increased. Second, there is no functional relationship between the *A* index for a certain period and the *A* indices of constituent sub-periods.

⁹ In the case of the Philippines, negative growth and zero growth in 1991 and 1992 respectively, belies the fact that strong GDP growth was recorded in the mid 1990s.

¹⁰ Noland (1997) found that the evolution of Korean trade patterns closely resembled that of Hong-Kong and Taiwan.

¹¹ A problem for scientific analysis of the Philippines' trade relates to the recording of trade data in recent years. For example, 34 per cent of exports and 18 per cent of imports were recorded in the SITC 9 category for special transactions. Around half of these export transactions are with the United States, while about the same percentage of imports in this category are from East Asia.

¹² see Greenaway and Milner (1986).

¹³ Note that the classical gains from trade are larger the more dissimilar the endowments of the trading countries. Our results only relate to one side of the trade-off between gains from specialisation and adjustment costs.