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## Evaluating economic integration in developing countries: An application for the ASEAN preferential trading arrangement

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Imada, Pearl Y., Ph.D.

University of Hawaii, 1990

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## EVALUATING ECONOMIC INTEGRATION IN DEVELOPING COUNTRIES:

## AN APPLICATION FOR THE ASEAN PREFERENTIAL TRADING ARRANGEMENT

## A DISSERTATION SUBMITTED TO THE GRADUATE DIVISION OF THE UNIVERSITY OF HAWAII IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

## DOCTOR OF PHILOSOPHY

IN

## ECONOMICS

MAY 1990

## By

## Pearl Y. Imada

## Dissertation Committee:

Seiji Naya, Chairperson Albert D. Moscotti Burnham O. Campbell William E. James Chung H. Lee

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#### ACKNOWLEDGEMENTS

This dissertation was completed because of the enormous support given to me by my colleagues, friends, and family. I would like to express my special appreciation to Dr. Seiji Naya, who served as the chairman of my dissertation committee and my mentor at the East-West Center Resource Systems Institute. He was instrumental in sparking my interest in ASEAN and I benefitted greatly from his experience and deep knowledge of the region. I would also like to thank the other members of my committee, Dr. Burnham H. Campbell, Dr. Chung H. Lee, and Dr. William E. James from the East-West Center and University of Hawaii, Department of Economics, and Dr. Albert D. Moscotti from the University of Hawaii, School of Hawaiian, Asian, and Pacific Studies, for their advice and support. Dr. Rodney Tyers of the Australian National University was also extremely helpful in allowing me to adapt his model to this task. Dr. Yongil Lim provided the basic data used in the disseration from UNIDO. All of my colleagues and co-workers at the East-West Center Resource Systems Institute were extremely supportive. In particular, Dr. Shigeyuki Abe provided me with programming assistance and advice, and Dr. Robert McCleery, Dr. Michael Plummer, and Dr. Manuel Montes provided useful comments and encouragement. Special thanks also go to Wesley Oasa and Cynthia Nakachi who helped to pull everything together on time. And finally, I would like to thank my parents for giving me the financial and emotional support that allowed me to follow my dreams, Lori, Leona, and Chris for their friendship and support, and my fiance, Kent, for being extremely patient, encouraging, and loving.

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## ABSTRACT

The similarity in export structure that is often cited as the reason for the slow progress in ASEAN preferential trading arrangements (PTA) is largely in primary commodities where intra-regional export expansion is unlikely to increase significantly. But this dissertation argues that there are large opportunities for trade expansion in manufactured products and to a lesser degree in agriculture and food products. The tariff structures of the ASEAN countries have been biased against other ASEAN countries and the present PTA has done little to correct this problem. Trade in manufactured goods has expanded in the region but the PTA has had little to do with the expansion.

To examine the potential effects of an improved ASEAN preferential trading arrangements, a variant of the Armington model developed by Tyers is used. The results show that welfare and efficiency gains will accrue to ASEAN countries if intra-regional trade is liberalized, partially or completely. Importantly, the negative effect on the rest of the world from trade diversion is less than the increase in welfare of the ASEAN countries, and therefore, enhanced trade cooperation in ASEAN increases world welfare as well.

Even a 20 percent across-the-board reduction of tariffs in manufactures will lead to large expansions of intra-regional trade. For the resource-rich countries, the increase in imports from other ASEAN countries range from an average of nearly 10 percent with a 20 percent across-the-board tariff reduction to about 50 percent with the establishment of a free trade area. Total consumption and production

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also increase in most cases, though the change is small, generally less than 1 percent even in the case of free trade. There is some redistribution of production with the more capital-intensive industries expanding in Singapore while other industries expand elsewhere and contract in Singapore. Food products expand in Thailand and the Philippines and contract in the other countries. Industrial restructuring is spread across countries and industries, and is unlikely to casue significant industrial dislocation with the possible exception of the food products industry. Overall, the effect of an enhanced PTA is enhanced efficiency and largely expanded intra-regional trade in ASEAN.

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#### CHAPTER I

## ASEAN ECONOMIC COOPERATION

## I. Introduction

The Association of Southeast Asian Nations (ASEAN) was established on 8 August 1967 when the Foreign Ministers of Indonesia, Malaysia, the Philippines, Singapore, and Thailand signed what has become known as the Bangkok Declaration. The sixth member, the oil-rich state of Brunei, joined in 1984. The Bangkok Declaration loosely bonded together a group of dissimilar countries to promote peace and prosperity in the region. It stressed the role of cooperation in strengthening the economic and social stability of the region and ensuring the stability and security of the member countries from external interference (ASEAN Secretariat 1978).

After more than 20 years of existence ASEAN is sometimes hailed as one of the most successful regional grouping among developing countries. Many developing country groupings are no longer in existence or have severely restricted the scope of their cooperative efforts. ASEAN, on the other hand, has consistently, albeit slowly, moved forward without the attrition of any members. ASEAN has made a name for itself in the international political arena by presenting a strong united front on several issues including the Viet Nam occupation of Kampuchea. It holds joint dialogues with its most important trading partners and also actively participated in the Cairn's group, an Australian initiated group of developed and developing countries that discusses agricultural trade issues.

In terms of economic cooperation, however, ASEAN's experience attests to the difficulties involved. It is generally agreed that ASEAN has had little direct economic impact on the countries in the region.' The good economic performances of the individual member countries were not directly linked to ASEAN, but were due to national policies. It is asserted that ASEAN economic cooperation has not amounted to much in terms of actual stimulation of intra-ASEAN trade or investment. None of the industrial cooperation schemes have really taken off. Even the most promising private-sector-focussed scheme has few working projects. The coverage of goods has increased under the preferential tariff scheme, but the increasing share of intra-ASEAN exports in the mid 1970s and early 1980s was found to have largely been an illusion due to high commodity and oil prices (Naya and Imada 1987).

Yet the challenges facing the ASEAN countries today and in the 1990s, are in the field of economic cooperation. International and regional politics that propelled ASEAN to forge regional cooperation in the past have changed and are pushing ASEAN toward expanded regional economic cooperation. Regional trading relationships have become more important in the developed world as evidenced by the European Communities' proposed market unification in 1992 and the ratification of the U.S.-Canada free trade pact. More recently, Australia has been in the forefront of a move to establish an Asia-Pacific economic grouping, patterned after the Organisation for Economic Co-operation and Development to include ASEAN as well as the major Pacific trading nations.

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A large premium is placed on ASEAN participation because of the perception of unity in the region. As a group, ASEAN member countries are able to command more attention than they would as individual countries. This is clearly a case where the total is greater than the sum of the parts. However, ASEAN's role in Asia-Pacific cooperation or in other bilateral or regional agreements will be largely determined by its cohesiveness, and in turn, this will be based on its commitment to economic integration. Indeed, close economic cooperation among the member countries will be a prerequisite for ASEAN to deal successfully in a world economy where regionalism is increasingly important. The need and urgency for greater economic cooperation was acknowledged at the third ASEAN summit where ASEAN leaders signalled important changes in both the substance and philosophy behind ASEAN cooperation.

Clearly, it will not be a simple task to set aside differences and overcome the problems that obstruct their efforts to become a cchesive market. The slow progress in economic cooperation in the past has been due not only to the mechanisms chosen to promote this effort but most importantly, because the member countries have chosen to take a cautious approach that does not allow ASEAN priorities to supersede national ones. This cautious approach, in turn, stems from fears and concerns regarding the effects of integration and their distribution, primarily arising from the differing characteristics of the economies of individual members. Many questions about the probable effects of greater economic cooperation need to be analyzed before ASEAN integration can take place. If ASEAN is indeed to move toward closer economic cooperation, the member countries will need a clear picture of

what can be expected--in terms of both possible gains and potential problems--and how to achieve the desired degree of economic integration most effectively.

Economic theory tells us that by lowering or removing trade barriers among themselves, countries can make economic gains arising from increased efficiency, attaining economies of scale, and other integration-induced changes affecting the quantity or quality of factor inputs, such as increased capital inflows (see Chapter II). The reduction of trade barriers also permits lower prices for consumers, wider consumer choice among goods, and hence gains in the economic welfare of member countries. At the same time, economic theory also cautions that integration may lead to welfare losses as higher-priced goods from member countries replace lower-priced goods from non-members. The net effect of regional integration in a particular case will depend on a number of factors, including market size, resource endowment, and trade policies and orientation.

The probable effects of integration in ASEAN remain uncertain. Although much has been written on ASEAN economic cooperation, this research tends to be based on general observations and impressions. Little or no quantitative or rigorous analytical work has been done on the various aspects of ASEAN economic cooperation. This dissertation will look closely at what has been accomplished, the problems involved, and what can be done in the future to enhance cooperative efforts. The goal of this dissertation is also to estimate the effects of enhanced cooperative efforts, with the hope that this will assuage uncertainties

and fears of the member countries so that they can boldly commit themselves to the concept of a larger, more unified ASEAN market.

## II. Summary of Study

As the ASEAN countries are poised to embark on a new era of regional cooperation, there is a clear need to reduce the uncertainties involved by identifying potential industries and estimating the probable effects of the preferential trading arrangements (PTA) or the ASEAN industrial joint ventures (AIJV) on trade and production in the region. This dissertation will examine ASEAN's progress in trade cooperation, both quantitatively and qualitatively. It will also estimate the effect an improved PTA can have on the growth and structure of production and trade in the region and highlight potential problems and benefits of integration. Background on the individual ASEAN members and the history of ASEAN cooperation is provided in the next section of this introductory chapter. Chapter II will look at some conceptual issues relating to several traditional forms of integration arrangements, including free trade areas and customs unions. It will highlight characteristics that could lead to large potential gains from economic integration. Chapter III will then discuss characteristics of ASEAN countries and ASEAN PTA that affect the potential benefits of economic integration. In particular, it will examine the comparative advantage of these countries, the potential for intra-industry trade, the potential for gains from economies of scale, and the structure of protection and preferences in the region.

Chapter IV presents a survey of empirical methodologies used to quantify the effect of integration schemes. Selected methodologies are then used in the following chapter, which will attempt to measure the effect that the ASEAN PTA has had on trade in the region and allow the consideration of the potential gains from integration in terms of intraregional import, export, and production growth. The model to be used is based on the Armington hypothesis of product differentiation. It is especially appropriate in looking at the effect of integration on the ASEAN countries because it goes beyond the simple measuring of trade diversion and trade creation suggested in the literature by including the effects on exports and production. The final chapter will summarize findings and make suggestions for future research.

## III. Description of ASEAN Cooperation

### A. Background

The ASEAN member countries are not a homogeneous group of countries. They differ in terms of historical and cultural aspects--colonial heritage, languages, religions, and traditions. Brunei, Indonesia, and Malaysia are Muslim nations; Thailand is Buddhist; and the Philippines is largely Christian. Of all the countries only Thailand has never been colonized--both the Spanish and U.S. influences are still seen in the Philippines, while the British have left their mark on Malaysia and Singapore, and the Dutch on Indonesia. There is also great disparity among the member countries with respect to physical area and population, not to mention natural resource base and stages of economic development which will be discussed

in detail in Chapter III. Singapore is a small city state while Indonesia, at the other extreme, covers a land area of nearly 2 million square kilometers and is among the largest countries in the world in terms of population. Accordingly, Indonesia is rich in natural resources, while Singapore has virtually none. Singapore, on the other hand, is rich in highly skilled human resources which are lacking in Indonesia. The other three countries lie between these extremes. In terms of economic development, the gap was also wide. Singapore and Indonesia again represent the two extremes, the former being among the richest in Asia while Indonesia is among the poorest. Singapore is virtually a free trade economy with a highly developed industrial sector and manufactured export base. Indonesia maintains high tariff walls and its exports are largely in primary commodities. The three intermediate countries are all relatively rich in natural resources, but also differ in terms of level of development and recent economic growth performance.

In addition to these differences, the prospective members had a number of political disputes among themselves. The Philippines initiated a claim to Sabah (Malaysia) in 1962 and there was considerable tension in Indonesia toward the new federation of Malaysia in 1963. A further source of tension arose with the expulsion of Singapore from the Malaysian federation in 1965.

These problems and differences on the one hand highlighted the need for regional cooperation but at the same time undermined previous attempts to establish a regional organization in the post-war period. Recognizing the need for cooperation, a meeting was organized in Bangkok and in August 1967 the Bangkok declaration that established ASEAN was

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adopted. At this stage, the precise goals of the organization were unclear. The Bangkok declaration provided only a generalized statement on the need for a foundation to develop and promote regional cooperation.

A large number of meetings were held, but the organization made virtually no formal progress and survived largely as a symbolic organization until 1975. Nonetheless, ASEAN did establish a pattern of regular contacts among regional leaders and helped to reduce the likelihood of regional confrontation.

The second phase of ASEAN cooperation began after communist takeovers in Viet Nam and Kampuchea. The ASEAN leaders united under the common threat of military aggression and began to look seriously at their mutual interests. The leaders saw the need to increase the substance of their cooperation, with an emphasis on promoting economic development as a way to reduce internal support for revolutionary movements. The first ASEAN Summit accordingly convened in February 1976 in Bali, leading to the signing of the Treaty of Amity and Cooperation in Southeast Asia and the Declaration of ASEAN Concord. The former document established the general principles for relations among ASEAN countries, while the latter formally set out some guidelines for more concrete regional economic cooperation. The ASEAN Secretariat was also set up soon after the Bali Summit, adding a coordinating body for economic cooperation. A second summit was held in August 1977 in Kuala Lumpur, concentrating on economic issues and on ASEAN's external relations.

During this period, the general strategy and attitude toward regional cooperation remained loose. Consensus was required in all decision-making, giving rise to lengthy negotiations. But at the same time, the consensus mechanism eased acceptance and implementation of programs and lessened problems involving the distribution of benefits and costs in any cooperation scheme.

ASEAN was relatively successful as a political organization and in its role in conducting external relations during this period. It was able to keep political pressure on Viet Nam in the international organizations and highlight the importance of the refugee problem. Its success in this regard earned it international recognition and support. ASEAN has also pursued joint dialogues and negotiations with its major trading partners.

Progress in economic cooperation, however, remained slow after the two summit meetings. After a long lull, ASEAN again was motivated to push ahead with its cooperative efforts in the mid 1980s. The slow growth of world trade in the early 1980s and the fall in commodity prices brought about a sharp drop in the growth of ASEAN countries. The fear of protectionism and the overall uncertainty in world trade conditions forced ASEAN countries to look within ASEAN for a solution. A third summit was called after a ten year lag. Economic concerns were the impetus behind the third summit held in Manila in 1987. The decisions made at the third summit represent a significant step forward in ASEAN economic cooperation, although many have been critical of or downplayed the results of the summit.

## IV. Economic Cooperation

As mentioned earlier, the Bangkok document which formed ASEAN did not contain formal plans for economic cooperation, though it did specifically state that the countries should strive to collaborate more effectively for, among other things, the expansion of trade in the region. It was nearly a decade later that the Bali Summit formalized the basic components of ASEAN economic cooperation which covered: (1) basic commodities, in particular food and energy; (2) industrial development; (3) trade; and (4) a common stand on international economic issues.

All economic cooperation activities are conducted through five committees: the Committee on Trade and Tourism, the Committee on Industry, Minerals, and Energy, the Committee on Finance and Banking, the Committee on Food, Agriculture, and Forestry, and the Committee on Transportation and Communications. The economic ministers of the ASEAN countries have authority over these committees while the ASEAN Secretariat has the task of coordinating and monitoring the activities of these committees as well as the other three committees on non-economic matters. An organizational chart of ASEAN is presented in Figure 1.1. Each of the committees are in turn supported by a host of sub-committees, working groups, and so on.

The aspects within ASEAN economic cooperation that most affect trade are its Preferential Trading Arrangements (PTA) and its three industrial cooperation schemes. The rest of the discussion will focus on these two aspects of ASEAN economic cooperation.

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Sub-Committees, working groups, ad hoc committees

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## Figure 1.1 Organizational Structure of ASEAN

Source: UNIDO (1986).

### A. Industrial Cooperation Schemes

There are three basic components of industrial cooperation in ASEAN: ASEAN Industrial Projects (AIP); ASEAN Industrial Complementation (AIC) and the ASEAN Industrial Joint Venture (AIJV). Like in other developing countries, the idea behind ASEAN cooperation in industrial projects is that the domestic markets of the member countries are too small to permit efficient operation of a wide range of manufacturing activities. Industrial cooperation was therefore based on the principles of resource-pooling and market-sharing. It was felt that regional industrial projects large enough to capture economies of scale could be designed. Since the projects were based on the regional market, market access was expected from all member countries.

1. ASEAN industrial projects

In the AIP, ASEAN agreed to cooperate in the establishment of large-scale industrial plants to produce essential commodities for regional requirements. The AIP program was meant to establish new, government-initiated projects that were jointly financed by all of the member countries (with the host country accounting for 60 percent). Under the AIP, one project was initially allocated to each member country: ASEAN urea project in Indonesia and Malaysia, the ASEAN Rock Salt-Soda Ash Project in Thailand and the ASEAN Copper Fabrication Project in the Philippines, and the diesel engine project in Singapore.

Thus far, only the two urea projects have been completed. It should be noted that both of these projects were initially planned as national projects and were simply turned into regional projects. In any case, neither are presently profitable enterprises. Thailand scrapped

its original project and is presently constructing a potash plant. The other projects have either been scrapped or are unlikely to be implemented.

2. ASEAN industrial complementation

In addition to the AIP, the AIC was also introduced to promote exchange of industrial products among member countries. The AICs were to be smaller-scale projects undertaken primarily by the private sector. The complementation agreements were meant to enable already existing enterprises to become more efficient through specialization in certain product lines while giving up others.

The ASEAN Industrial Complementation covers packages of industries, one of which was assigned to each participating member country. The participation of at least four of the five member countries was generally required. The country would have exclusive production rights for a specified period (two years in the case of existing products and three years for new products). The approved products would receive preferential tariff rates under the PTA.

The ASEAN Chambers of Commerce and Industry (CCI), as a representative of the private sector, was assigned to identify appropriate products or industries. After evaluation by the ASEAN Committee for Industry, Minerals, and Energy (COIME), proposals are recommended to the ASEAN Economic Ministers Meeting (AEM).

Under the AIC, two packages for the production and distribution of automotive parts were proposed in 1976 by the ASEAN Automotive Federation and submitted to COIME in 1979. One of these packages was confirmed by the AEM in October 1983. The second package, covering new

automotive products, was deferred indefinitely in 1982 pending a thorough review of the guidelines for product identification and allocation. It was more recently accepted under a "brand-to-brand" complementation, where production was confined to intermediate inputs for the assembly of one brand of product. The present AIC projects currently under operation both involved joint ventures with Japanese automobile manufacturers (Mitsubishi and Toyota).

3. ASEAN industrial joint ventures

The ASEAN industrial joint ventures was initiated in 1983 to increase progress in industrial complementation. The AIJV were generally smaller projects requiring only two or three ASEAN partners from the private sector and did not contain a "package." This avoided the difficulties of allocation of industries and as well as the cumbersome approval process of the AIC, as these projects could be approved individually by the relevant economic ministers. Any manufactured product under the AIJV would qualify for a 50 percent tariff cut (which was increased to 75 percent in 1987) within the participating countries for a four year period.<sup>2</sup> Further, while it was meant to promote cooperation among the private sectors of member countries, it allowed 49 percent non-ASEAN ownership (which could be increased under certain circumstances).

At the Manila summit, ASEAN leaders agreed to strengthen the AIJV. The approval process was eased for these projects through a pre-approval system and the tariff preference was increased to 90 percent. Any project with a product on the list would automatically receive AIJV status if it is in compliance with the other requirements. Maximum

foreign equity participation was increased to 60 percent. It was notable that no mention was made of the other industrial schemes that involved public sector investments or industrial specialization.

Fifteen projects have been approved, but implementation has been slow. Seven of the projects are currently in operation, one was withdrawn, and the rest are in various stages of implementation. Some of the projects not yet in operation received approval as early as 1984, and several of the projects that are in operation have not been able to export their products with preferential tariff rates.

4. Problems of the industrial cooperation schemes

The lack of willingness to share markets has limited the potential of all three schemes. The countries were unwilling to impart production of any good to a designated country and were not willing to allow the goods produced under these schemes to flow freely among them with significantly lowered trade barriers. Several of the programs have confronted existing non-tariff barriers affecting trade of the products and bureaucratic slowdowns for approvals.

Other problems of the AIP include the difficulty in identifying suitable projects and the bureaucratic problems often found in public enterprises. Projects for the AIP were selected without adequate feasibility studies as to the most economical site for the project or the profitability of the project. Furthermore, the large scale of the projects has meant substantial capital outlays by the public sector. These large-scale, government-financed projects have been a disappointment not only in the ASEAN context but in all developing countries. Public enterprises have been a drain on government finances

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in many countries.<sup>3</sup> The AIP is also contrary to the more private-sector approach to development that is now being emphasized by the ASEAN governments. It is unlikely that there will be any further such projects.

The AIC, as a more private sector-based scheme, is somewhat more promising. The past difficultly in selecting projects may be somewhat alleviated by the "brand name" approach presently being used.

Some problems confronted by the AIJV's include local content accreditation and an apparent lack of awareness of the ASEAN industrial cooperation schemes among ASEAN and non-ASEAN businessmen (Khanthachai 1988). A more inherent problem is the project-by-project nature of the program which resemblas the initial item-by-item approach to trade liberalization. The recent amendment to the AIJV that may help to facilitate more rapid progress is the pre-approval of a list of products. The AIJV has the greatest potential of the ASEAN industrial schemes and can be highly complementary to the preferential trading arrangements.

B. Preferential Trading Arrangement

In January 1977, at the third meeting of the ASEAN Economic Ministers, the draft of The Agreement on ASEAN Preferential Trading Arrangements (PTA) was approved and was signed by the five ASEAN Foreign Ministers in Manila on 24 February 1977. This represented the first major commitment on the part of all the ASEAN countries to make joint efforts to liberalize intra-regional trade. Before the Bali summit meeting, the desirability of some sort of PTA had been discussed by the ASEAN officials, but no accord on procedure (across-the-board vs.

product-by-product) was reached. In addition, some countries were concerned that domestic industries would be hurt.<sup>4</sup>

The preamble to the Agreement emphasized the role of PTA "as a stimulus to the strengthening of national and ASEAN economic resilience and the development of the national economies of the Member States by expanding investment and production opportunities, trade, and foreign exchange earnings."<sup>5</sup> The PTA had a flexible approach with no specific goals, but provided a mechanism whereby intra-ASEAN trade could be liberalized at the pace acceptable to all member countries. The ASEAN Committee on Trade and Tourism (COTT) was "directed and authorized to conduct trade negotiations within the framework of this Agreement and to review and supervise the implementation of the agreement."

The instruments adopted for the preferential trading arrangements were: long-term quantity contracts, purchase finance support, preference in procurement by government entities, extension of tariff preferences, liberalization of non-tariff measures on a preferential basis, and other measures. Long-term contracts, normally lasting for a period of three to five years, were to apply to selected products subject to specific agreements. The agreement on purchase finance support provided preiesential interest rates to be applied to either exports to or imports from member countries of selected products to ASEAN domestic origin covered by the PTA. Preferential margins allowed governments to accept a higher bid from a regional supplier provided that the difference between the higher price and the lower price does not exceed 3.5 percent.

Tariff preferences were to be extended mainly to basic commodities, particularly rice and crude oil, the products of the AIP, and other commodities of interest to the member countries. The extension of trade preferences was to be done on a product-by-product basis as recommended in the United Nations study (United Nations 1974), and concessions were to be extended to all ASEAN countries on a most-favored-nation basis. It was also agreed that the margin of tariff preferences "accorded to the selected products should take into account existing levels of tariffs in the respective Contracting States (ASEAN Secretariat 1978)." In other words, countries like Singapore that had virtually no tariffs were allowed to bind tariffs at zero rather than make large concessions.

Initially, the extension of trade preferences was to be done on a product-by-product basis, selected by a matrix approach and a voluntary approach. In the matrix approach, a member country requests that a certain product be included in the PTA on a bilateral basis. If the other country approves, the product is included and the concession is multilateralized. Under the voluntary approach, each country voluntarily offers a list of products for tariff reductions to all other countries.

The Agreement also specified that concessions would be given on products originating in member countries. The Rules of Origin formed Annex I of the Agreement. They specify that only "products wholly produced or obtained in the exporting Contracting State" and "products not wholly produced or obtained in the exporting Contracting States (but for which the portion originating from non-ASEAN sources) does not exceed 50 percent of the FOB value of the products produced or obtained

and the final process of manufacture is performed within the territory of the Contracting State" are eligible for preferential concession.<sup>6</sup> For Indonesia, however, the percentage was set at 40 percent, though for certain categories of manufactures this could be raised to 50 percent. Additionally, products manufactured from materials or parts imported from one member country and exported to another are regarded as originating from an ASEAN country if the aggregate ASEAN content of the final products is not less than 60 percent. The rule, however, could be waived in the case of any of the ASEAN industrial schemes.

Throughout the remainder of the 1970s, the PTA involved the cumbersome and complex product-by-product approach to tariff reductions. Trade preferences started with the exchange of voluntary offers on 20 products which was subsequently increased to cover 21 items selected by the matrix approach and 50 items by the voluntary approach for a total of 71 items (6 digit BTN classification). Singapore offered 10 percent reductions on 15 items, including textile products and garments; Malaysia bound six zero-tariff items and offered reductions of between 10 and 15 percent on five items; the Philippines offered reductions of between 10 and 30 percent (the most common was 20 percent) on 14 items, including tractor tires, ball bearings, glass gypsum, and maize and palm oil; and Thailand offered reductions of between 10 and 30 percent on 14 items including logs, paraffin wax, insecticides, artificial butter and ball bearings.

In 1976, estimates for the value of imports by ASEAN countries from other ASEAN countries under concessional tariff rates totaled \$47 million, ranging from about \$18 million for Malaysia to about \$100,000

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for the Philippines (Naya 1980). This accounted for less than 2 percent of total intra-ASEAN trade and 12.4 percent of total imports of these items (intra-ASEAN trade as a whole also comprised about 12 percent of the total trade of ASEAN countries).

The involved procedures of this first exchange led the members of COTT to agree to meet quarterly with a list of at least 50 items per country being offered. The number of items offered and covered under PTA increased at each meeting to include 2,327 items by 1979.

After 1980, the ASEAN leaders adopted a more serious approach to trade liberalization and shifted from the voluntary product-by-product approach to a more efficient across-the-board approach. Initially, the across-the-board tariff cuts of 20 percent were approved for more than 6,000 items with intra-regional trade value of less than US\$50,000 as recorded in the trade statistics for 1978, subject to national exclusion list of sensitive products. The ceiling was subsequently raised to US\$500,000, then \$1,000,000, and to \$10 million in 1982. Finally, in 1984, the ASEAN foreign ministers approved the application of a 20-25 percent tariff cut on all items with import value beyond US\$10 million, effectively doing away with the ceiling.

As of June 1986, 12,647 items are covered under ASEAN PTA. Nearly half of these items are accorded 20 to 25 percent margin of preferences, though the distribution varies by country (Naya and Imada 1987). Malaysia offered full exemption for 25 percent of the 2,260 items covered. In Singapore, which has a large number of zero duty items, 93 percent of the margin of preferences granted were simply bound at zero. The average preference margins under ASEAN PTA ranged from 2.3 percent

in Singapore to 41.8 percent in Malaysia. In Indonesia, the Philippines, and Thailand, the margins were closer to 25 percent.

Intra-ASEAN trade increased rapidly as a share of total trade in the mid-1970s, reversing a downward trend of the early 1970s (Figure 1.2). By 1983, intra-ASEAN trade accounted for 24 percent of exports and 21 percent of imports. Many felt that this increase was due to the ASEAN PTA, but the large drop in the share of intra-ASEAN trade after 1983 to less than 18 percent presently made it clear that other factors were involved. In particular, studies have shown that intra-ASEAN trade consisted largely of petroleum trade between Indonesia, Malaysia, and Singapore (see Chapter III). Petroleum accounts for 50 percent of intra-ASEAN exports, making petroleum prices a major factor in the value of trade in the region. Singapore refines the crude oil of Brunei, Indonesia, and Malaysia and exports it to third countries or back to the ASEAN countries.

The disappointing economic impact of the PTA can be largely attributed to various implementation problems and problems inherent in the PTA itself. First, PTA did not identify commodities for preferences in line with the comparative advantage of the member countries. Because the tariff reductions were negotiated on the basis of the Brussels Tariff Nomenclature (BTN) seven-digit level, they had little practical value in terms of effective trade expansion. Many of the commodities selected for preferential treatment were not traded or only lightly traded within the region (Tan 1982). Chapter III shows that preferences tended to be given on products where countries were strong exporters and were unlikely to face competition from other member countries. Second,



Source: International Monetary Fund, Direction of Trade Statistics, computer data tapes and Yearbook 1989.

although the successive increases in the ceiling allowed PTA to cover more products without the cumbersome negotiations of the product-by-product approach, the large exclusion lists (with the exception of Singapore) constrained the expansion of intra-ASEAN trade. The items on the exclusion list comprised 25 percent of all goods in the Philippines, 39 percent in Malaysia, 54 percent in Indonesia, and 63 percent in Thailand (Naya and Imada 1987). Moreover, there was a general tendency for the percentage of goods excluded to increase with the import value range. For example, in Malaysia, only 20 to 30 percent of items where trade was less than \$500,000 were on the exclusion list, as compared to 60 to 80 percent of the more heavily traded items. Third, the tariff reduction offered on the items is too low to permit a significant impact on potential imports, except for items with extremely high price elasticities of import demand. There is no indication that items under the PTA have especially high price elasticities. The calculations in Chapter V show in fact that elasticities are likely to be low. Fourth, as tariffs are reduced, non-tariff trade barriers tend to have an increasing effect on limiting trade expansion.

The third ASEAN summit addressed some of these problems. Most importantly, it gave clear direction to trade cooperation. For the first time, a goal was set to cover 50 percent of the value or 90 percent of all items under the ASEAN PTA after five years (seven years for Indonesia and the Philippines). The degree of tariff preferences given to ASEAN members was also deepened from 25 percent to 50 percent and the exception list was restricted to 10 percent of all items. The ASEAN leaders also agreed to increase the transparency of the process by

having each country draw up schedules of goods subject to tariff reductions. In this way, the private sector can more effectively respond and take advantage of the tariff reductions. It is as yet uncertain how effective the countries will be in actually implementing the scheme.

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#### NOTES

- 1. See for example Ooi (1986), Rieger (1985), Tan (1982), and Wong (1989).
- 2. In the original proposal at the CCI meeting in June 1981, the AIJV product would also qualify for tariff preferences in all the ASEAN countries. This provision, however, had to be dropped.
- 3. See Naya 1990.
- 4. Several bilateral arrangements had been concluded, however. For example, the Philippines and Singapore previously entered into a bilateral agreement, agreeing to implement mutual across-the-board preferential reductions of 10 percent on all products produced in their countries and traded between them.
- 5. See ASEAN Secretariat (1978) for key official documents and declarations of ASEAN.
- 6. According to Rule 2 the following are considered as wholly produced or obtained in the exporting country: (1) mineral products extracted from its soil, its water, or its sea beds; (2) agricultural products harvested there; (3) animals born and raised there and products obtained from them; (4) products obtained by hunting or fishing conducted there; (5) products of sea fishing and other marine products processed and/or made on board its factory ships; (6) waste and scrap resulting from manufacturing operations conducted there; (7) used articles collected there, fit only for the recovery of raw materials; (8) goods produced there exclusively from the products referred to in (1) to (7) above.

#### CHAPTER II

#### SURVEY OF LITERATURE:

# THE THEORY OF INTERNATIONAL ECONOMIC INTEGRATION

## I. Introduction

The ASEAN countries have eschewed using the word "integration" and have preferred to use the term "economic cooperation." Nonetheless, the trade and industrial cooperation agreements are a step toward economic integration and must be evaluated in those terms. This chapter will review the theory of economic integration, discussing possible gains or cost of various types of integration arrangements.

# A. Definition and Rationale

The use of the term "economic integration" is relatively new; Machlup (1977) was unable to find a single use prior to the 1940s. Since then the term has been used to describe a large number of cooperative economic agreements, but economic integration has generally come to be defined as a systematic cooperation that requires countries to give up some degree of sovereignty for a common purpose.

More specifically, the theory of international economic integration is primarily concerned with the lowering or removal of trade impediments between participating nations while maintaining trade restrictions with the outside world, though it may involve the establishment of other elements of cooperation between member nations. In other words, all such arrangements involve the shifting of sources of supply, either to lower or higher cost sources, through the suppression of trade barriers among members and the maintenance of discrimination against the rest of

the world. The members need not be neighbors, although they often are. As such, Lipsey (1960) defined the theory of economic integration to be a branch of tariff theory dealing with the effects of geographically discriminatory changes in trade barriers. Balassa (1962), on the other hand, disagreed and emphasized that integration among developing countries is concerned with not only trade, but more importantly, development.

Regional groupings have been formed for a variety of reasons. Political factors have been the overriding concern in many cases, but all countries attempting to establish a degree of regional integration do so with expectations of some economic gains. Regional integration benefits the member countries by ensuring access to the markets of their partners. It also provides an opportunity to increase production through specialization according to comparative advantage and economies of scale. But it may also involve paying higher prices for regional imports, establishing monopoly positions in particular industries, drawing away resources from more productive uses, and obscuring other policy options. The net gain must be considered relative to viable alternatives.

B. Types of Integration Arrangements

There are a variety of possible arrangements. Four generally standard arrangements are listed below:

1. Elementary forms of integration

Trading arrangements can be formed by partially reducing rather than eliminating trade impediments. These groupings are sometimes

called Preferential Trading Areas and the Association of Southeast Asian Nations (ASEAN) is an example of such an arrangement.

A sectoral approach to economic integration is also possible. The predecessor to the European Community (EC), the European Coal and Steel Community, is an example of a case where the realization of integration on an economy-wide scale was not yet possible, but integration on a limited scale was desired.

2. Free trade area

Members eliminate tariffs among themselves but keep their freedom to determine tariffs against the outside world. Certificates of origin are necessary in this kind of agreement to confine free trade to production originating in, or at least mainly produced in, member countries. The European Free Trade Association (EFTA) and the Latin American Free Trade Association (LAFTA) are examples of this kind of arrangement.

3. Customs union

Members not only eliminate all tariffs among themselves but also form a common tariff against the outside world which eliminates the need for rules of origin. A common, union-wide price for imports is therefore established with variations only for other taxes and transport costs (assuming no other distortions). The European Community (EC) is a customs union in this sense, but it also goes beyond a customs union and consists of other elements of economic integration as well.

4. Common market

Members proceed beyond the requirements of a customs union to eliminate trade restrictions among themselves but also allow free factor

mobility across national member boundaries. Capital, labor, and enterprises are free to move between participating countries. The EC is the most commonly cited example of a common market, though some restrictions on the flow of capital and labor remain in place.

5. Economic union

Members proceed beyond the requirements of a common market to unify their fiscal, monetary, and socioeconomic policies.

#### II. Static Economic Gains and Costs of Integration

Economic theory has long argued that freer trade increases welfare. Since free trade maximized welfare and since these arrangements were a movement toward free trade, it was argued that customs unions would increase welfare even if they were less favorable than a non-preferential freeing of trade. In the 1950s, however, several articles argued that the welfare losses incurred through the formation of integration areas may exceed the gains.

A. Trade Creation and Trade Diversion in Customs Unions

1. Production effects

Viner (1950) argued that although significant economic benefits can be derived from customs unions, they are not without costs.<sup>1</sup> He first showed that preferences could either improve or worsen allocation of resources, leading to "trade creation" or "trade diversion," because discriminatory trading arrangements both distort and liberalize trade. Trade is created because some goods face lower restrictions than before and expensive domestic production is replaced by cheaper imports from a partner. But trade is also diverted from non-partners to partners

because of price discrimination. Goods from a lower cost producer may be replaced by a less efficient member of the PTA. This means that productive factors will be redistributed in such a way that less is produced with a given amount of resources than under free trade, leading to welfare losses. Viner stressed that trade creation is beneficial since it was a movement toward efficiency while trade diversion is harmful, thus the net effects of any regional grouping must be determined to ascertain whether they enhance an area's welfare.

2. Consumption and welfare effects

After Viner's seminal article, a host of articles appeared, leading to the development of a new area in international economic theory. For example, James Meade (1955) and others (Lipsey 1957 and 1960) expanded Viner's analysis of production effects of customs unions by introducing the idea of gains from changes in the pattern of consumption. The elimination of tariffs and quotas on imports from member countries will lower prices for the consumer. Consumers' demand will shift from foreign goods to member's goods in response to changes in relative prices.

Lipsey also included the concept of welfare gains and costs in considering trade creation and trade diversion as an example of his "general theory of the second best" (Lipsey and Lancaster 1956). This theory states that when all optimal conditions are not satisfied, it is impossible to predict the welfare consequences of satisfying only some of the optimality conditions. In other words, the movement from one sub-optimal condition to another, even if it is a movement closer to the optimal situation, could make a country better or worse off.

## 3. Illustration

These concepts can be illustrated by a simple one-product, one country, partial equilibrium model (Figure 2.1).<sup>2</sup> Thailand's demand curve for a product is DD, its supply curve is SS, and supply from the rest of the world is WW (small country case). Thailand imposes a tariff on imports equal to WT, but joins a customs union with a common tariff equal to WC (in other words, Thailand lowers its tariff when it joins the customs union). Before the union, Thailand produces OL and consumes OL', with LL' being imported from the lowest cost world producer (not in the union). The cost of protection is the extra production (OM would have been produced under free trade), a+j+f, and the reduction in consumption (OM' would have been consumed), b+h+r. Tariff revenue (d+c) accrues back to the government to be redistributed.

If Thailand joins a customs union which reduces its tariff to WC, and imports are now supplied by the lowest cost union producer, Singapore, domestic production will decline and consumption will rise. This lower level of protection will still incur a resource loss (j) and consumption loss (r) as compared to a free trade position, while the total gain will be (a+f) and (b+h). The areas (f) and (h), however, are not a gain over the free trade position because of the higher cost of Singapore's good relative to the world price. Part of the tariff revenue (d) will go back to consumers in the form of lower prices, but (c) is lost because of the higher cost of the good from Singapore. Thus the net gain of joining a customs union for Thailand is (a+b-c), where (a) is trade creation, (c) is trade diversion, and (b) is the consumption effect.





Source: Johnson (196/).

4. Determinants of net gains

Various factors will determine the net gain of customs unions. From Figure 2.1, it can be seen that:

- a. The higher the initial tariff relative to the post-union tariff, the greater the potential benefit (larger areas a and b). When domestic industries are highly protected and trade is small relative to domestic production, the scope for trade creation is greater since intra-union trade is more likely to displace high cost domestic producers and the possibility of negative consumption effects will be smaller;
- b. The narrower the gap between the union price and the world price, the smaller the trade diversion;
- c. The larger the elasticity of demand, the larger the increase in total consumption will be (area b will be larger);
- d. The larger the elasticity of supply in the home country, the larger the decrease in domestic production and the larger will be the positive production effect (area a will be larger);
- e. The greater the elasticity of supply of nonmembers, the larger will be the reduction of imports from nonmember countries.

Additionally, as Viner (1950) pointed out, the more competitive the economies are, i.e., the more similar the range of products produced, the greater will be the possibilities for trade creation and the less likely trade diversion will occur. Meade (1955) later clarified this by specifying that trade creation will be greater if the countries are initially competitive but potentially complementary or dissimilar. This means that because of the protection structure, similar goods are

produced before integration, but when tariffs are reduced or eliminated between members, the differences in unit costs in the previously protected industries will be large. The scope for more efficient producers in one country to expand trade at the expense of less efficient producers elsewhere will be great.

Furthermore, the larger the economic area of the preferential arrangement and the more numerous the countries included, the greater the scope for trade creation. The scope for trade diversion will also be lower since it will be more likely that the lowest cost producer will be within the union.<sup>3</sup>

Trade creation is also more likely when existing external trade between prospective members is already large, thus making it less probable that imports will be diverted to high cost sources within the union and more likely that consumption effects will be positive. Analogously, the lower the volume of trade conducted with nonmembers, the smaller will be the possibility of trade diversion in a customs union. Moreover, the probability of a customs union raising welfare will be inversely related to the total volume of foreign trade in the pre-existing situation (Lipsey 1960). In other words, the countries most likely to gain from a customs union are those that have a high proportion of their total expenditure on domestic trade, increasing the possibilities for trade creation. Those countries with a low proportion of domestic trade are likely to lose because of the increase in probability of trade diversion, especially if the customs union does not include a high proportion of their foreign trade.

The degree of trade creation which occurs also depends on transport costs and other natural barriers to trade. Transport costs may give a domestic producer some degree of protection against competitors. Obviously, lower transport costs make increases in trade within the group more likely and thus increase prospective gains from integration. This is sometimes a problem in integration groups among developing countries where transport lines are sometimes not as well-developed among members as they are with developed countries.

B. Free Trade Areas and Other Forms of Integration

The discussion above has been limited to the costs and benefits of customs unions. Some discussion is in order about differences between customs unions and free trade areas, as well as some pros and cons of other arrangements.

1. Free trade areas

As mentioned in the description of different types of economic integration, two main distinguishing features of free trade areas are: (1) member countries retain the power to set independent tariff rates on goods from the rest of the world; (2) a free trade area requires rules of origin to confine free trade to goods originating mainly from within the area.

The major benefit of the first feature is that countries which have the lowest duties are not forced to raise duties. In a customs union, the common external tariff chosen is usually a compromise between conflicting interests of each member. The common tariff structure is thus likely to tend toward an intermediate level in most commodities, meaning that some prices will fall and some will rise in the member

countries. The net gain will depend on many factors, including the size of the tariff and price changes and the elasticities of demand for the goods in question. Countries with overall low initial tariffs may be worse off under a customs union because their overall tariff levels are likely to rise. In contrast to a customs union, open economies are never worse off under free trade areas. Therefore, economists generally conclude that free trade areas are preferable to customs unions in terms of allocative efficiency (Robson 1984).

However, one must also consider the production-distorting effects on non-harmonized tariffs in free trade areas. Unlike a customs union, in a free trade area rules of origin are necessary to assure that only goods produced in a member country is allowed duty free. The rules of origin have the purpose of avoiding <u>trade deflection</u> (Balassa 1962) or the exploitation of tariff differentials. Without rules of origin, imports from nonmembers would go through the country with the lowest level of tariffs and proceed duty free to other members with higher tariffs. For the ASEAN countries, this is especially serious because of Singapore's virtually free trade status. Thus with trade deflection, only Singapore's tariffs would likely be operative and goods would pass duty-free to other ASEAN countries. Independence in external trade barriers would be lost. To maintain individual country tariff levels, an appropriate domestic resource content requirement must be determined which will avoid trade deflection and yet not unduly restrict trade. The administrative problems of determining domestic content shares and enforcing the requirement, however, are great.

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In addition to the problem of trade deflection, the existence of tariff disparities on inputs in a free trade area may give rise to distortions of production in the region. As Curzon (1974) points out, if two countries are equally efficient in production and both import raw materials, production will tend to concentrate in the countries with lower tariffs on inputs. The allocation of resources in the free trade area will, therefore, be distorted if large disparities on input tariffs prevail. Some harmonization of access to raw materials and intermediate goods is needed to avoid these distortions.

Assuming that the countries in the free trade area are able to avoid trade deflection, a similar static presentation of costs and gains of free trade areas can be made. The production and consumption effects involved in customs unions also appear in free trade areas, though as mentioned earlier, welfare losses will tend to be lower since countries are not forced to raise tariff rates. Another major difference is that if the price a producer in Singapore can get domestically is lower than that in Thailand, Singapore will supply everything it can produce to Thailand and import to cover the shortfall in its domestic market. Robson (1984) calls this "indirect trade deflection," which cannot be eliminated by rules of origin.

2. Other variants

As mentioned above, other modified forms of regional trading arrangements are possible. Partial removal or lowering of tariffs will basically have the same trade creating and trade diverting effects as free trade areas, though it cannot be determined a priori whether they will be more or less welfare enhancing. Several economists, however,

have argued that partial removal of trade barriers is more welfare creating than a total removal. Meade (1955) argues that potential welfare gains are largely determined by the magnitude of the price differentials between two countries, which is defined as the sum of the initial duties. The largest gains will therefore occur at the initial stage of reduction when tariff levels are at their highest. Subsequent cuts are not likely to yield much in terms of welfare gains. Lipsey (1960) argues that a partial removal is more likely to be welfare creating from the theory of the second best. Assuming that some optimum second best solution exists and a movement away from this solution will reduce welfare, moving away from the second-best optimum position is a sufficient but not necessary condition for a reduction in welfare. On the other hand, moving towards the social optimum is a necessary but not a sufficient condition for an increase in welfare. Since any movement going away from the second-best optimum position will be welfare reducing and a movement toward the optimum may or may not be welfare enhancing, he argues that a small variation in tariff levels is more likely to raise welfare than a large variation.

Theoretically, there are many objections to the other variant of integration, the sectoral approach. Integration in only one sector means that adjustment must be made in that sector with no compensating adjustments in other sectors. That is, losses suffered by contracting industries will not be made up until some subsequent phase. As Balassa (1962) points out, under the sectoral approach, prices, costs, and resource allocation must adjust to a new equilibrium level at every step. These adjustments would be smoother if all sectors were

integrated at once, since some industries will be expanding while others are contracting. Unnecessary resource shifts would not occur. Furthermore, discrimination between sectors may increase effective rates of protection.

Another problem with partial agreements which cover some product areas and not others is that the negotiating process can lead to an emphasis on trade diversion and little trade creation. That is, the member countries can limit the effect on domestic industries by selecting industries that would generate little new imports and biasing the process toward trade diversion rather than trade creation.

It is preferable, therefore, to emphasize an overall approach to economic integration in trade. A sectoral approach can be used profitably, however, in the case of special problematic areas. An example is the formation of EFTA excluding trade in agriculture. In this way, a regional group can keep negotiations concerning a few sensitive sectors from impeding the progress of overall trade liberalization.

C. Other Gains and Costs

In addition to the production and consumption effects, integration will also modify trade balances and income distribution in the region. Concern about the possible impacts on trade balances and income distribution have in fact been a major stumbling block in integration agreements among developing countries. Moreover, political and other dynamic economic gains may be more important to countries than the gains from trade creation and trade diversion.

## 1. Balance of trade effects

As a whole, the group should experience a net improvement in balance of payments because of the displacement of nonmember countries' exports. But for a single member, changes in trade and capital flows could cause a net positive or negative balance of payments effect. Exports would increase as goods flow into other member countries replacing inefficiently produced domestic goods (trade creation) and more efficiently produced goods from nonmember countries (trade diversion). Imports, however, could increase as domestic goods are replaced with more competitive goods from other member countries (trade creation) when tariffs are lowered. Any trade diversion that takes place will not change the amount of imports, only the country of origin. The net effect balance of trade effect will depend on the factors determining the degree of trade creation and trade diversion occurring.

2. Terms of trade effects

A complication is added to the determination of the effect of customs unions and free trade areas if the country does not face perfectly elastic supply curves. Johnson (1962) and Mundell (1964), pointed out that if the assumption of perfectly elastic supply curves are relaxed, terms-of-trade effects must be taken into account. For customs unions and free trade areas where the total volume of trade with the rest of the world is large relative to total world trade in a given commodity, the formation of the group is likely to lead to a change in the world price of that commodity. Discriminatory trading arrangements can worsen terms of trade with partners but will generally improve it with the outside world (Mundell 1964 and Ardnt 1968). Petith (1977),

for example, found that the terms of trade with the rest of the world improved for the EC. However, the gains from improved terms of trade will occur only if the outside world does not retaliate. The formation of a large grouping may encourage action by other nations.

The terms of trade effect can be shown with the use of offer curves (Figure 2.2). The switch of trade away from nonmember country C, as countries A and B adopt preferences, has the same effect on C as if A's and B's offer curves were shifted inward. Trade diversion will initially increase export prices and reduce import prices for the union. This will generally result in an improvement in the balance of payments, which may induce further improvement in the terms of trade (Balassa 1962).

It should be noted that the terms of trade effect of a customs union is not the same as in a free trade area. As Robson (1984) points out, if the formation of the customs union does not affect the demand for imports from the rest of the world, the union's terms of trade will not be affected, even if supply from the rest of the world is less than perfectly elastic. Otherwise, there will be a tendency for improvement. But for free trade areas, the effect is less clear because trade with third countries is less likely to be reduced and in fact may even rise if trade deflection takes place. Consequently any welfare gains due to terms of trade effects will be smaller in a free trade area.

3. Income redistribution effect

Balassa (1962) points out that economic welfare will be affected not only by trade creation, trade diversion, and the terms of trade effect, but also by the effects of income redistribution among countries



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Figure 2.2. Terms of Trade Effect

Source: Pomfret (1986).

within the integration grouping. Unequal distribution can result in higher differences in terms of development than in the pre-integration period. Robson (1984) points out that if some countries within the integration area are much more developed than others, the gains are likely to be unevenly distributed. The advanced countries are likely to attract more new industries and thus the already industrialized countries become more industrialized while the more rural areas are condemned to stay at a lower level of industrialization.

This problem is purported to be a major stumbling block in integration efforts especially among developing countries. Robson (1984) recommends several steps that can be taken to alleviate this problem including fiscal compensation to the least developed and incentives to influence location of production.

Recently, however, the belief that the heterogeneity of member countries causes conflicts and failures has been questioned. Straubhaar (1987) cites Langhammer and Spinanger (1984) who found no statistical evidence that variations within integrated areas have been any larger in developing than in developed countries. He explains this result by arguing homogeneity in industrial development alone will not cause conflicts or failures but homogeneity in conjunction with the level of development and the size of the integration area (possibility for economies of scale) will determine the success in economic integration.

4. Political concerns and public goods

Customs union theory shows that discriminatory preferences may lead to losses which would not have occurred if trade liberalization had taken on a multilateral basis. Yet countries have continued to favor

the formation of customs unions. Rather than accept a simplistic explanation that governments must therefore be irrational, a "collective good" argument has often been used to explain why governments have continued to lean toward free trade areas and customs unions despite costs involved. Cooper (1976), for example, argued that regional groupings were more effective than either global institutions or national governments in providing collective goods characterized by the presence of externalities, etc. Additionally, he argued that other objectives such as economic stabilization may be best pursued through regional groupings.

Johnson (1965) and Cooper and Massell (1965) argue that although protection of a particular industry may encourage excess production, if the origins of the preference lies in nationalist aspirations, etc., taking these into account adds a new dimension to the problem. Johnson, for example, assumes:

(1) governments use tariffs to achieve certain non-economic objectives (i.e., political reasons);

(2) actions taken by governments are aimed at offsettingdifferences between private and social costs;

(3) government policy is a rational response to the demands of the electorate;

(4) countries have a preference for industrial production.
Under these conditions, Johnson found that both trade creation and trade diversion yield a gain to the partners in the PTA and in fact, trade diversion is preferable to trade creation for the preference-granting country since a sacrifice of domestic industrial production is not

required. Cooper and Massell (1965) also find that trade creation is not necessarily good nor is trade diversion necessarily bad. The gains from a customs union depend on what happens to income and industrial output. This in turn depends on the common external tariff chosen, and on the national trade-off between industrialization and national income. They conclude that the gains from a customs union would be larger if (1) the countries had a strong preference for industry; (2) the countries were complementary, and (3) no country dominates the others in industrial production. They note, however, that even if the last condition does not hold, gains could still be obtained by forming a partial union.

5. Indirect Economic and Dynamic Effects

For most regional groups, especially among developing countries, the argument for regional economic cooperation rests more on dynamic gains due to changes in the structure of production and trade. Robson (1984) argues that gains resulting from integration in developing countries will not be derived from changes in the existing pattern of trade which is based on the existing pattern of production. Thus, the gains from economic integration for developing countries are likely to be seen in future investment and production.

Mayes (1978) also argued that changes in trade flows due to the formation of integration areas will occur as a result of changes in comparative advantage but also such dynamic variables as business efficiency, the exploitation of economies of scale, international standardization, etc. These effects may in fact far outweigh the simple static effects mentioned in the previous section.

Some dynamic sources for economic gain from free trade areas and customs unions are:

(1) increased output made possible by better exploitation of economies of scale due to the larger size of the market;

(2) enforced changes in economic efficiency brought about by increased competition within the group; and

(3) changes affecting the quantity or quality of the factors of production, such as increasing capital inflows, learning by doing, and changes in the rate of technical advance.

With the exception of economies of scale, the other factors are very long-term in nature, making it difficult to estimate any possible effects much less to incorporate them in orthodox economic models. Although they may be important, especially to developing countries, no attempt is made to quantify the possible effects.

The effects of economies of scale can come from two sources: from a larger market and from a faster growing market. The former is a once and for all effect and in that sense is not truly a dynamic gain but the effect of this is likely to be large. It is widely argued that capturing internal economies of scale because of larger production facilities, longer production runs, or more economical use of research facilities would lower the cost of output. In other words, the cost curve of the firm (or plant o. industry) is downward sloping. Increases in the quantity produced would therefore lead to lower costs and thereby provide a one-time increase in welfare. Economies of scale are a function of the scale of input of either an entire industry or of individual plants and exist because of the indivisibility of capital

equipment of skills or workers, or the existence of costs which increase less than proportionately with output (Balassa 1962). The larger size would thus provide a launching pad for successful operations.

In the context of customs unions, however, Johnson asks, "If there are economies of scale, why are they not already being exploited?" He argues that to achieve gains from economies of scale one must assume that the countries were not able to export due to high tariffs in potential markets abroad, which effectively limited the size of the market to domestic consumption. In his words (Johnson 1957, p. 35), "it is extremely difficult to believe that British industry offers substantial potential savings in cost which cannot be exploited in a densely-populated market of 51 million people...especially when account is taken of the much larger markets abroad in which British industry, in spite of restrictions of various kinds has been able to sell its products."

The argument best used to counter this is imperfect competition. As Lipsey (1960, pp. 276-7) points out, "Unexhausted economies of scale are incompatible with the existence of perfect competition, but it is equally well known that unexhausted economies of scale are compatible with the existence of imperfect competition as long as long-run marginal cost is declining faster than marginal revenue." The market structure will then be one of monopolistic competition (Krugman 1979).

Corden (1972, p. 467-68) suggests that in situations where economies of scale are present, it is necessary to include the distinct concepts of "cost reduction effects" and "trade suppression effects." Cost reduction as distinct from trade creation "is the result not of a

movement to a cheaper source of supply but rather of the cheapening of an existing source of supply." The cost reduction effect will take place when a country obtains its own product at a lower price or purchases from the partner when it was previously supplied domestically. The trade suppression effect will occur when production did not occur among members initially within the union, but later, when more expensive domestic production begins and replaces cheaper imports from the rest of the world.

Economies of scale can then be analyzed within a partial equilibrium framework. It assumes that production in each country faces increasing returns to scale as reflected by declining average cost curves.<sup>4</sup> In Figure 2.3, D<sub>AB</sub> is the demand curve for both the home country, Thailand, and the partner country, Singapore, and  $D_{A+B}$  is their joint demand curve.  $P_wW$  is the world supply and AC<sub>A</sub> and AC<sub>B</sub> are the average cost curves for Thailand and Singapore, respectively. Note that the world price is lower than that which will be charged by the cheaper producers in Singapore. If tariffs are initially charged in both countries such that domestic production is equal to domestic consumption, prices  $P_A$  and  $P_B$  will prevail in the domestic markets. Tariffs  $t_a (P_A - P_W)$  and  $t_b (P_B - P_W)$  will prevail in the respective countries. When Thailand and Singapore enter into a customs union, the entire output will be produced by Singapore at price  $P_{A+B}$ , with an external tariff (t<sub>atb</sub>) set appropriately. Consumption will increase in Thailand from  $q_i$  to  $q_3$  and production in Thailand will cease. Because inefficient domestic production is replaced by more efficient imports from Singapore, resources will be released to move to more productive





Source: El-Agraa (1982).

areas, giving rise to trade creation in production equal to  $P_ADGP_{A+B}$  or  $(t_a-t_{a+b})q_1$ . As Krauss (1972) points out, with decreasing costs, the production component is approximately twice as large as with positively sloped supply curves. Trade creation from consumption will equal DIG, making total trade creation  $P_ADIP_{A+B}$ . For Singapore, on the other hand, consumption will increase from  $q_2$  to  $q_3$  while production increases from  $q_2$  to  $q_4$ .  $P_BFIP_{A+B}$  or  $(t_b-t_{a+b})(q_3-q_2)/2$  is the total cost reduction effect. The rectangle IJML represents additional gains from sales to the partner country, but since in effect Thailand's consumers are paying more than the world price for the product, they are in effect transferring this amount to Singapore's producers.

#### IV. Motives for Integration Arrangements

Economic theory clearly supports multilateral trade liberalization as being welfare enhancing, and the effects of discriminatory trading arrangements are ambiguous. Nonetheless, the number of such groupings among developing countries grew rapidly in the 1960s and 1970s and have maintained their popularity into the 1980s as developing countries sought to enhance their economic opportunities and to reduce their external dependency. A major political consideration for integration among developing countries spins off from the dependency theory that was popular in the postwar period and the export-pessimism espoused by Prebisch (1950). It is felt that dependency of developing countries can be cured by collective self-sufficiency, since the old idea of national self-sufficiency was very unsuccessful. Prebisch argued that a declining terms of trade for primary products was inevitable and thus

industrialization must be promoted behind high tariff walls in LDCs. Although his argument has been proven to be misguided, the emotional appeal contributed to the formation of economic integration areas among developing countries.

Along the same line, Lewis (1980) in his Noble Prize acceptance speech, advocated the increase of South-South trade to reduce external vulnerability of LDCs. He felt, in the tradition of the export pessimists of the 1950s and 1960s, that slow growth in the developed countries can be mitigated by increasing trade among developing countries. Integration may also increase the bargaining power of LDCs.

Political factors have been the overriding impetus for the formation of many groups, but the prospect of economic gains was also important. As stated by UNCTAD (p. 11) in 1967, "regional economic groupings, integration or other forms of economic cooperation should be promoted among developing countries as a means of expanding their intra-regional and extra-regional trade and encouraging their economic growth and their industrial and agricultural diversification..." The ASEAN declaration states that their objective was "to accelerate the economic growth, social progress and cultural development of the region through joint endeavors in the spirit of equality and partnership in order to strengthen the foundation for a prosperous and peaceful community of South-East Asian nations."

The proliferation of multilateral trading agreements helps to validate criticisms that the conclusions drawn from static analysis of integration efforts do not capture all of the possible economic gains. In fact, most countries are not concerned about the overall world
welfare which is measured in the standard analysis. As pointed out by UNCTAD, they are concerned about maintaining economic growth and in addition, want to maintain healthy balance of trade and payments positions. Wonnacott and Wonnacott (1981) argue that the major reason a country participates in a customs union is to penetrate the partner's market through the reduction in the partner's tariff. As such, the increase in intra group exports should also be considered.

Moreover, it has been argued that for developing countries, increased domestic production is an important goal, and thus trade diversion is even preferable to trade creation since it means increased regional production. Because a principle objective of economic integration is to foster industrial development for most regional groups among developing countries, the economic argument for regional economic cooperation rests on dynamic gains due to changes in the structure of production and trade. Principally, the prospective gains from economies of scale with the enlargement of the market or improvements in efficiency in production with increased competition are considered to be important. In other words, efficient resource allocation does not necessarily correspond to short-run optimality conditions. This is the familiar infant industry argument which says that dynamic considerations may warrant the temporary application of protectionist measures.

Economic integration may have the effect of reducing the cost of policies to develop domestic industries. In other words, trade diversion in favor of the most efficient producer in the region may be preferable to trade diversion in favor of the domestic producer at any

cost. Under integration, the inefficiencies of protectionism would be reduced as the size of the protected area increases.

Similarly, Havrylyshyn and Wolf (1981, p. 31) argue that if trade barriers exist, dismantling them will be extremely difficult and thus preferential liberalization of trade among developing countries may be the only politically practical way of dealing with domestic protectionist lobbies. "As experience among developed countries has shown, reciprocal liberalization is the most effective way of defusing opposition. In the case of developed countries, however, their size in world trade makes it politically easy to liberalize on a most-favored nation basis, while ignoring free riders. For developing countries this is not practical." They conclude by say that "if unilateral liberalization is a political impossibility, discriminatory liberalization may be the best available policy from an economic point of view."

Further, Balassa (1966) argues that the case for universal free trade is based on limited state intervention. With a great deal of government intervention in other areas of the economy (especially factor markets), free trade may not result in an optimal allocation of resources. Some policy harmonization may be necessary to remove distortions in competitive cost relationships, but this may not be feasible for the world as a whole. Freeing trade and coordinating policies among a smaller group may attain better results.

Dosser (1972) points out that in the case of developing countries in particular, one must look at the social cost and social benefit of each industry. He defines social cost to be the excess cost of

producing at home, i.e. the domestic cost compared to cost of imports and the social benefit to be the external economies of industrialization (employment creation or higher wage rates) and the value of foreign exchange saved. He concludes by saying that trade creation and trade diversion both have beneficial elements; trade diversion is beneficial up to the point where social benefits exceed social costs while trade creation is beneficial except where it leads to an undesirable concentration of the benefits in one country.

It is clear that these concerns not dealt with in integration theory--such as domestic production as a national goal and political constraints--have been major considerations in the proposals for economic integration including ASEAN. Nonetheless, proposals for economic integration should be assessed by their economic costs and benefits.

At this juncture it is important to look at what theory would suggest for ASEAN. The next chapter will examine elements of the economic and trade structures of the ASEAN countries that economic theory suggests will be determining factors in the welfare effect of integration in ASEAN.

# NOTES

- 1. Analytically, Viner could be said to have anticipated the basic thesis of the "heory of the second best" (Lipsey and Lancaster 1956).
- 2. Others, including El-Agraa (1984), used a similar diagram but without the assumption to perfectly elastic supply by the partner country. The additional supply from the partner country is added horizontally to the domestic supply curve. The same analysis will apply.
- 3. Note that some have argued that the larger the area, the chances of moving toward policies emphasizing autarky increase. This would increase the cost due to trade diversion (Balassa 1962).
- 4. Williamson (1971) points out that it is reasonable to assume average cost pricing with economies of scale because marginal cost pricing would result in losses.

#### CHAPTER III

#### PROSPECTS FOR ASEAN INTEGRATION: EXPECTATIONS FROM THEORY

#### I. Introduction

The previous chapter showed that the net effects of integration in ASEAN when viewed in terms of economic efficiency cannot be determined a priori. This chapter looks at important aspects of the economic and trade structures of ASEAN countries that may indicate the extent to which integration in ASEAN will result in trade creation or trade diversion.

Several simple indicators may be used to ascertain possible static effects. First, it has been argued in the previous chapter that the higher the proportion of trade conducted among the member countries prior to the formation of the union, the greater expansion of intra-area trade and welfare will be. Second, initially high tariff levels are likely to induce more trade creation. Third, differences in pre-integration levels of development may cause problems related to distribution of gains in integration groups. Fourth, it is generally believed that developing countries, individually or as a small integration group, have insufficient economic power to influence their terms of trade by altering the volume of their exports or imports.

In addition to these indicators, several indicators of more long term effects should be examined. First, theory suggests that there would be more scope for trade creation if the countries concerned were initially competitive in production but potentially complementary. Although the structure of their present trade would suggest that they

are quite competitive, it is uncertain whether or not they are potentially complementary economies.

Second, an offsetting factor for the lack of complementarity could be the potential for intra-industry trade a la Linder (1961),<sup>1</sup> but studies have suggested that this may not be relevant for countries with iow levels of income (Kleiman and Kop 1984).

Third, the prospective of gains from economies of scale with the enlargement of the market or improvements in efficiency in production with increased competition are considered to be important. Economic integration may have the effect of reducing the cost of policies to develop domestic industries. That is, under integration, the inefficiencies of protectionism would be reduced as the size of the protected area increases. However, the ASEAN countries even as a group comprise a relatively small market and thus may not have sufficient potential for economies of scale to gain significantly from integration.

Fourth, it is important to consider whether or not tariffs constrain the imports of the goods highlighted above. If tariffs are not the constraint, then inclusion of a good into the PTA may not affect trade. Tariffs appear to be important in ASEAN, however, because protection tends to be highest in finished products which can be produced in the region and lowest in the machinery and equipment imported from developed countries. This means that the escalated structure of protection in developing countries can discriminate against exports of other developing countries.

#### II. Indicators of Possible Static Gains

Simple static effects of integration as emphasized in traditional theory generally would argue that developing countries in particular have little to gain at best, and at worst may be harmed by economic integration. It is important to look at some of these indicators to ascertain a priori the possible net effect of integration on ASEAN.

A. Pre-integration Intra-regional Trade Levels

Economies of developing countries generally are more oriented toward the industrially advanced countries; a higher proportion of the external trade of LDCs is undertaken with industrialized countries. For the ASEAN countries, as discussed in Chapter I, a significant amount of intra-regional trade occurs (Table 3.1). Averaging nearly 20 percent in the 1980s, ASEAN intra-regional trade is significantly higher than in other developing country groups, which average less than 5 percent (UNCTAD 1987). Only the Central American Common Market has slightly higher shares. Much of intra-ASEAN trade is in petroleum and petroleum products. Excluding petroleum decreases the value of intra-ASEAN trade by nearly 50 percent. Yet, when looking at non-oil trade, intra-ASEAN shares are still high at nearly 19 percent.

Nonetheless, it is clear that developed countries remain ASEAN's major trade partners. Trade with developed countries has continued to account for approximately 60 percent of exports and imports since the 1970s (Table 3.1). Because of the importance of primary commodities in ASEAN exports, developed countries are a natural market for their products. Agricultural and mineral commodities (including fuels) account for a large share of merchandise exports in the region, ranging

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Year	Total (US\$m)	Developed countries	United States	Japan	Developing countries	Other ASEAN
Export	s					
1970	6.153	61.3	17.3	24.0	34,6	19.8
1971	6,639	61.1	17.6	23.7	35.8	20.1
1972	7.925	62.5	17.8	24.2	34.9	18.8
1973	13,489	63.9	16.7	26.9	32.6	17.6
1974	22.813	65.5	19.1	30.3	31.0	15.4
1975	21.076	63.3	19.6	26.6	34.2	17.0
1976	26,492	65.0	20.6	25.5	32.1	16.0
1977	32.293	64.0	21.2	24.2	32.7	15.7
1978	37,102	62.3	20.4	23.7	34.6	16.3
1979	51,283	62.4	17.6	26.3	34.4	17.3
1980	67,386	60.3	16.7	26.5	36.4	17.8
1981	70,431	57.2	16.1	26.0	39.6	18.4
1982	69,677	54.9	14.4 .	25.8	43.8	22.8
1983	71,556	54.6	17.9	22.9	44.3	24.0
1984	76,899	57.3	19.3	23.9	41.5	19.8
1985	69,317	58.5	20.1	23.6	40.4	18.7
1986	65,839	59.2	20.9	21.2	40.0	17.3
1987	82,301	58.7	21.3	19.7	40.5	18.2
1988	103,664	58.1	21.1	18.4	41.2	17.7
Import	S					
1970	7,552	65.6	14.7	24.8	31.5	14.7
1971	8,166	66.0	14.0	25.5	31.4	13.9
1972	9,550	66.2	15.2	26.2	31.0	13.6
1973	14,575	63.6	15.6	24.5	33.1	14.1
1974	23,566	61.0	14.6	23.2	35.9	13.0
1975	24,018	61.2	15.1	23.3	35.7	12.7
1976	26,807	58.0	15.0	22.3	38.9	14.8
1977	31,235	56.9	13.2	22.9	39.9	15.5
1978	37,543	58.5	13.7	23.9	38.0	14.8
1979	48,634	56.0	15.2	21.0	40.5	16.7
1980	65,911	54.2	14.7	20.9	42.8	16.9
1981	73,405	53.8	13.9	21.8	43.3	16.2
1982	77,671	52.9	14.5	20.7	46.6	19.5
1983	79,337	53.4	15.2	20.7	42.2	20.8
1984	75,620	55.2	16.1	21.1	44.4	18.9
1985	65,213	55.0	15.3	20.2	44.6	18.6
1986	62,804	57.7	15.8	21.9	41.8	17.1
1987	79,710	56.9	14.7	22.0	42.4	17.6
1988	103,947	55.2	15.4	23.4	40.9	16.6

# Direction of ASEAN Exports and Imports (percentage of total exports and imports)

Sources: International Monetary Fund, <u>Direction of Trade Statistics</u>, Annuals 1970-76, 1971-77, Yearbooks 1979 through 1989, and computer data tapes.

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from 85 per cent in Indonesia to about 50 per cent in the Philippines and Singapore (Naya and Imada 1987). Because of the role of Singapore as an entrepôt and processing center of the region, a large percentage of this trade is conducted within the region.<sup>2</sup> Nonetheless, developed countries are important final purchasers of primary commodities, accounting for more than 50 percent of ASEAN's exports of these goods.

The composition of ASEAN exports has changed dramatically over the 1970s and 1980s. Manufactured exports rose sharply as a share of total exports, from less than 2 percent in 1970 to 30 percent in 1987 in Indonesia and from about 10 percent in the other resource-rich countries to between 40 and 60 percent over the same time period (World Bank 1989). The increasing importance of manufactured exports clearly reflect the increasing level of ASEAN industrialization. The promotion of the manufacturing factor as an essential ingredient in development strategy plays an important role in this change. As many ASEAN members shifted away from the agricultural sector to manufactures, export-oriented industries grew dramatically. Nonetheless, with the exception of Indonesia, 60 to 70 percent of manufactured exports of the ASEAN countries are directed to developed countries, especially the United States (Table 3.2).

Additionally, as would be expected of countries experiencing rapid industrialization, manufactured products particularly from developed countries accounted for more than half of total imports. These generally consisted of more capital-intensive goods such as electrical and non-electrical machinery, chemicals, and transport equipment.

# Table 3.2

(percentage of total manufactured exports to the world)							
Country of origin	World (US\$m)	Other developed	United States	Japan	Other developing	ASEAN-5	EC
ASEAN							
Indonesia	4,030	3.8	23.2	21.5	19.5	11.0	13.6
Malaysia	6,877	5.1	36.2	5.4	12.3	23.2	17.2
Philippines	2,232	6.6	40.4	7.7	12.9	9.6	21.0
Singapore	18,680	6.0	33.6	4.6	17.6	20.9	14.3
Thailand	5,924	7.2	24.7	8.0	21.3	16.4	21.4

# Direction of Manufactured Exports<sup>4,b</sup> (percentage of total manufactured exports to the world)

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NOTES:

a. Defined as SITC (5+6+7+8) - SITC (67+68).

b. 1987 Indonesia, Malaysia, Singapore, and Thailand; and 1988 for the Philippines.

Sources: United Nations, Commodity Trade Statistics, various issues.

### B. Height of Pre-integration Tariffs

Tariffs in developing countries tend to be high, and therefore lowering them would yield large potential gains. In ASEAN, with the exception of Singapore, average tariffs are significantly higher than in developed countries, though lower than most developing countries (Table 3.3). Because of the relatively high tariff levels, integration is likely to displace high cost domestic producers with positive consumption effects. In the case where tariffs were prohibitive in the past, there is little trade to be diverted and a lot of trade that is likely to be created.

However, the extent to which tariff reductions will increase consumption will depend on several factors including non-tariff barriers, tariff redundancies, and import demand elasticities. If import licensing and quantitative restrictions are prevalent, tariff reductions will do little to increase trade. Azarcon (1982) found, for example, that some products entitled to tariff concessions under the PTA have non-tariff barriers that may effectively nullify the preferences. In addition, if tariffs are not meaningful in terms of restricting imports, then the effect of tariff reductions will be limited. Langhammer (1988), for example, points out the tariff collection rates in ASEAN countries tend to be low because a considerable share of imports are exempted from import duties under the provisions of investment codes, government procurement procedures, and national development plans. Langham er also points out that excluding Singapore the collection rate is lowest in Indonesia, the country with the highest tariff rates, indicating the presence of some Laffer curve effects.<sup>3</sup>

# Table 3.3

# Trade-weighted Average in Selected Developed and Developing Countries

Country/group <sup>a</sup>	World trade weights MFN
Developing countries	
NTEs	
Korea	13.0
Singapore (1983)	1.3
ASEAN-4	
Indonesia (1980)	23.0
Malaysia (1981)	11.6
Philippines (1985)	19.9
Thailand (1981)	14.5
South Asia	
Bangladesh (1983)	68.8
India (1984)	44.8
Pakistan (1982)	43.4
Sri Lanka (1983)	21.8
Developed countries	
Australia	12.4
Canada	6.5
Japan	3.5
New Zealand	13.6
United States	3.9

# NOTE:

- a. The data shown in parentheses show the year for which the tariff data were drawn. Since the UNCTAD data base did not contain information on developing country preferential arrangements, an applied tariff average could not be computed.
- Source: Yeats, A. "The Escalation of Trade Barriers," in J. Michael Finger and Andrzej Olechowski (eds.), <u>The Uruguay Round:</u> <u>A Handbook on the Multilateral Trade</u> <u>Negotiations</u>. Washington, D.C.: The World Bank, 1987.

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Further, as will be discussed in Section V of this chapter, the structure of protection in ASEAN countries often does not reflect the comparative advantage of the countries. High levels of tariffs are often found on products that are important export items of the country. Because of the strong competitive position of the country in that product, tariffs may not provide any protection to the industry. Further, the large share of imports to total consumption (which would imply few domestic substitutes are available) would indicate that the elasticity of demand for imports in ASEAN countries tends to be relatively low. This would suggest that the change in the consumption of imports would not be large with a decrease in tariffs.

At the same time, the average tariff rates of the individual ASEAN countries are widely divergent. This suggests that a free trade area will be difficult to achieve because of the problems involved with trade deflection. Without strictly enforced rules of origin all trade will flow through Singapore and all the countries will become essentially free traders. But the problems of determining the origin of a product are immense and highly restrictive rules of origin may hamper the free flow of goods.

C. Differences in Pre-integration Level of Development

ASEAN is far from a homogeneous group of countries. The level of development varies widely, with per capita GDP ranging from \$7,623 in Singapore and \$451 in Indonesia (Table 3.4). The level of industrialization as measured by manufacturing to GDP ratios also ranges widely, from 14 percent in Indonesia to 27 percent in Singapore.

# Table 3.4

	Population (millions)	Area (1,000 km²)	GDP (US\$m)	GDP per capita (US\$)	Structure of manuf. GDP <sup>4</sup>
Indonesia	170.2	1,919	75,232	451 <b>°</b>	14
Malaysia	16.6	330	32,036	1,935	17
Philippines	57.4	300	34,595	603	25
Singapore	2.6	1	19,895	7,623	27
Thailand	53.6	542	47,137	879	21

Selected Indicators of Development and Size in ASEAN, 1987

### NOTE:

a. 1986.

### <u>Source</u>: Asian Development Bank, <u>Key Indicators of Developing Member</u> <u>Countries of ADB</u>, 1988.

As pointed out earlier, however, this does not necessarily mean problems will arise, though the relatively small size of the market is also a negative factor. Nonetheless, the average level of development is quite high, with both Malaysia and Singapore categorized as high-middle income countries and the other countries as middle-income countries. Further, the small size of the two more developed countries relative to the other countries would indicate that the extent to which these countries can dominate the region is limited. With Indonesia's recent strong economic performance and its increase in manufactured exports, the disparity among the countries will be less of an issue than in the past.

#### D. Terms of Trade Effect

ASEAN countries produce significant proportions of certain world crops and certain minerals. Abaca, rubber, copra, coconuts, palm oil, and tin are some examples. They are also important producers of some spices such as pepper, kapok, and nutmeg, and other agricultural products such as timber.

Nonetheless, they comprise about 3 percent of total world trade and an even smaller share of world output. In other words, although they are important producers of a few products, the ASEAN countries combined are a small market. Because of this small market size, any increase in trade among the ASEAN countries due to the reduction of intra-regional tariff barriers will not affect the world supply or demand to the extent that it will have an appreciable impact on world prices. For example, an elimination of tariff barriers on palm oil may increase imports of palm oil from Malaysia by the other ASEAN countries, but this increase will not be large enough to decrease supply to the rest of the world and affect world prices. At the same time, a preferential reduction of tariff barriers on certain electronics products may increase Singapore's exports of these goods and correspondingly decrease the other ASEAN countries' demand for the rest of the world exports of these goods, but this decrease will not be large enough to affect world prices.

#### III. Complementary or Competitive?

An important criterion of success for an integration area concerns the inherent complementarity or competitiveness of the member countries. The Heckscher-Ohlin theory of trade predicts that trade will occur

between the most dissimilar countries, measured in terms of endowments of capital and labor (later broadened to include other factors of production) and factor productivity. This describes the colonialist pattern of trade of the late 19th century, whereby the advanced countries export manufactures to their colonies in exchange for raw materials. Because of the similar income levels and resource endowments among developing countries as compared to developing countries and industrialized countries, the Heckscher-Ohlin theory and product cycle considerations would predict that only a small proportion of trade will be South-South trade. In other words, the comparative advantage of developing countries tends to lie in similar goods.

To determine whether or not the ASEAN economies are complementary or competitive it is first necessary to determine the comparative advantage of the member countries. Unfortunately, this is not an easy task and there is no precise method of doing so given the data constraints. This section will look at the differences in the comparative advantage of the member countries using basic indicators of factor endowments and export specialization.

A. Factor Endowments

The dominant theory of the determinants of the pattern of comparative advantage--and thus of the pattern of international trade--is the factor proportions theory. Simply put, the factor proportions theory states that countries will be net exporters (importers) of goods which embody relatively large amounts of their abundant (scarce) factors of production. Although the theory in its traditional form deals only with the composition of trade in a

two-factor, two-good, two-country framework, Deardorff (1982) demonstrated in a general model (allowing any number of goods and factors, with or without international factor price equalization, and with impediments to trade) that there is a positive relationship between the factor-content of trade, commodity composition of trade, and national factor endowments. There have been numerous empirical tests of this theory, the result of which have been mixed for various reasons, including the specification of the models and the difficulty involved in empirically estimating the variables.<sup>4</sup> Nonetheless, it is generally agreed that countries on average will export goods intensive in the countries' abundant factors.<sup>5</sup> Further, other studies have found that the changes in the factor content of trade correspond with changes in resource endowments.<sup>6</sup>

To examine differences in the comparative advantage of the ASEAN countries, it is therefore important to look at differences and similarities in their factor endowment. Leamer (1984), in his comprehensive, multinational study testing the factor proportions theory, found that according to 1975 data Indonesia, Malaysia, the Philippines and Thailand have quite similar resource abundance profiles.<sup>7</sup> He found that all four are lacking in capital with capital-labor ratios ranging from 4.8 in Indonesia to 3,000 in Malaysia (Table 3.5). Leamer also found that except for tropical land, all four countries are lacking in land. All countries are abundant in minerals but only Indonesia is considered to be abundant in oil. The countries have an abundance of all three classes of workers, professional, nonprofessional literate, and illiterate, though the order of importance

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Tal	ble	3.	5

	Capital Stock <sup>a</sup> (US\$m) (1)	Labor (mil) (2)	K/L (1)/(2)
<u>1975</u> (from Leamer 1984)			<u></u>
Indonesia	229	47.0	4.9
Malaysia	10,225	3.4	2,983.7
Philippines	19,831	15.7	1,263.2
Singapore	10,025	0.9	11,780.0
Thailand	18,883	19.2	983.9
<u>1985</u> (calculated as shown	wn below)		
Indonesia	115,428	63.8	1,808.5
Malaysia	50,198	6.0	8,312.3
Philippines	51,630	21.2	2,435.4
Singapore	43,215	1.2	35,893.0
Thailand	60,442	26.8	2,251.3

Capital Labor Ratios, 1975 and 1985

#### NOTE:

a. Capital stock calculated  $K_t^b = \sum_{j=0}^t (1-\sigma)^{t_j} (I_j/P_j^b)$ 

and converted into current U.S. dollars by  $K_t^{\delta} = K_t^{\delta} P_t^{\delta} e_t$ .

- Where: I<sub>t</sub> = gross domestic investment in year t in units of home currency; P<sup>b</sup> = implicit gross domestic investment deflator at
  - $t_{t}^{b}$  = implicit gross domestic investment deflator at time t with base year b,  $P_{b}^{b}$  = 1.0;
  - et = exchange rate in time period t, dollars per unit of home currency;
  - $\delta$  rate of depreciation with asset life set at 15 years.
  - $P_t^b(S) = U.S.$  implicit GDI deflator.

<u>Sources</u>: Asian Development Bank, <u>Key Indicators of Developing Member</u> <u>Countries of ADB</u>, July 1988. Leamer (1984) for 1975 data. World Bank, data tapes. differs for each country. In the Philippines, illiterate workers are the smallest group, and nonprofessional literate workers are the largest. In the other three countries, professional workers are the smallest, but only in Malaysia are illiterate workers more prevalent than nonprofessional literate workers. Singapore's resource abundance profile is quite different from those of the other ASEAN countries. It is relatively capital abundant with a capital-labor ratio of nearly 12,000. But it is generally lacking labor, though it has a moderate amount of professional workers.

From Leamer's resource abundance profiles, theory would suggest that the four resource-rich countries would have similar trade composition though the Philippines would exhibit comparative advantage in human-capital intensive exports. Looking more specifically at the kinds of natural resources available in these countries, however, clear differences emerge. As Leamer's figures suggest, with the exception of Singapore which has virtually no natural resources, the ASEAN countries are resource-rich. But they are not all equally rich in the same natural resources. Indonesia and to a lesser extent, Malaysia have petroleum. Indonesia also has natural gas and limited amounts of other mineral resources such as tin, nickel, bauxite and copper. Malaysia and Thailand are among the world's largest producers of tin and both have some iron. Thailand is also a large producer of agricultural products and has significantly higher ratios of arable land per capita than the other countries (Table 3.6). Malaysia and Indonesia have relatively high ratios of forest area per capita. Malaysia is also one of the world's largest producers of rubber and palm oil as shown its high ratio

# Table 3.6

	Agricultural land per capita <sup>a</sup> (hectare)	Forest area per capita <sup>b</sup> (hectare)
Indonesia	.128	.744
Malaysia	.279	1.279
Philippines	.145	.208
Singapore	.002	.001
Thailand	.382	.292

Indicators of Resource Endowment in Agriculture, 1985

NOTES:

a. Agricultural land is defined as arable land and land under permanent crops.

b. Forest area is defined as forest area plus woodland.

<u>Sources</u>: Asian Development Bank, <u>Key Indicators of Developing Member</u> <u>Countries of ADB</u>, April 1983, July 1986, and July 1988. Food and Agriculture Organization of the United Nations, <u>FAO Trade Yearbook</u>, 1975 through 1985; <u>FAO Production</u> <u>Yearbook</u>, 1986.

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of permanent crops per worker. The Philippines is less endowed with minerals, fuel, and land but it does have some cobalt, copper, gold, nickel, and iron, and is a large producer of coconut and coconut products.

Basic indicators of human and physical capital also show considerable variation. Table 3.4 showed that per capita GDP, which is often used as a proxy for both physical capital and human capital intensity, ranges widely in the region. Singapore is an outlier with a per capita income of more than US\$7000, but there are wide differentials among the other four countries as well with Malaysia at nearly \$2,000 Indonesia at less than \$500. In addition, the ratio of manufacturing output to total output, which would also give an indication of capital endowment, ranges widely, again with Singapore as the highest with 27 percent of its production in manufactures. In terms of the four resource-rich countries, Malaysia and Indonesia are again at either extreme with 25 percent and 14 percent respectively. Looking at more recent capital-labor ratios confirms the pattern (Table 3.5). Capital-labor ratios in Singapore are extremely high at more than 35,000, and again Malaysia and Indonesia represent either extreme among the resource-rich countries.

One indicator of human capital endowment--school enrollment ratios--also varies widely within ASEAN (Table 3.7). Frimary school enrollment ratios are about 100 percent in all cases but secondary school ratios vary widely with Singapore and the Philippines at close to 70 percent and Thailand at 30 percent. In terms of higher education, Thailand and the Philippines have the highest percentage of students

Tab	le	3	7

	Enrollment rates as a % of age group (1986)			Literacy
	Primary	Secondary	Tertiary	rates (1985)
ASEAN				
Indonesia	118	41	7	74
Malaysia	101	54	6	73
Philippines	106	68	38	86
Singapore	115	71	12	86
Thailand	99	29	20	91

Indicators of	Educational	Attainment
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Sources: Asian Development Bank, Key Indicators of Developing Member Countries of ADB, July 1989. UNESCO, <u>Statistical Yearbook 1988</u>. World Bank, <u>World Development Report 1988</u> and <u>World Development Report 1989</u>. enrolled at 23 and 29 percent, respectively, and Singapore follows with 12 percent.<sup>4</sup> Although there are some measurement problems with enrollment ratios, literacy rates also tell the same general story, with rates higher than 80 percent in the Philippines, Singapore, and Thailand.

These indicators of factor endowment would suggest that trade patterns of the ASEAN economies would exhibit some complementarities. Thailand should have considerable comparative advantage in agriculture and tin while Indonesia and Malaysia should have comparative advantage forest products and minerals. Singapore's comparative advantage in the region would be in physical and human capital, while the other countries, with the exception of the Philippines in human capital, are relatively endowed with less skilled or unskilled labor.

B. Export Specialization

Rather than taking into account all of the influences that determine comparative advantage, many of which are not readily available (e.g., inter-country cost comparisons) or quantifiable, Balassa (1965) introduced the "revealed" comparative advantage (RCA) methodology. He hypothesized that the comparative advantage of a country can be indicated by its export performance, since comparative advantage would be expected to determine the structure of exports. The index may be more appropriately called the export specialization index.<sup>9</sup>

1. Methodology

The export specialization index is calculated assuming export patterns reflect intercountry differences in competitiveness in terms of relative costs as well as non-price factors. The index is defined in

terms of a country's composition of exports relative to the commodity's share in total world exports. In symbols:

i:

If the ES ratio is less than unity, this is generally interpreted to mean that the country has a comparative disadvantage in the trade of the product in question. Conversely, a ratio greater than unity is take to indicate that the country specializes in the sector.<sup>10</sup>

2. Data used

For the five ASEAN countries, the export specialization index is computed at the three- and two-digit SITC level. To avoid the problem of distortions due to unusual years, a two year average (1983-84) was used to compute each index. The export data for the individual countries are from United Nations, <u>Commodity Trade Statistics</u>, Series D, and the data for world exports are from United Nations, <u>International</u> <u>Trade Statistics Yearbook</u>.

Because most studies using this index, including Balassa's original study, look at trade of the developed countries only manufactured exports are usually considered. Further, a large number of primary products are subject to subsidies, quotas, and special arrangements, making distortions more likely in non-manufactured goods sectors. For the ASEAN countries, however, trade in primary commodities is essential. Therefore, this study looks at total exports (including primary

commodities) but includes separate calculations for manufactured goods only. Additionally, calculations were done using total ASEAN trade as a base to give an indication of relative export specialization within the region.

The classification of exports by factor intensity is done following a revised version of Tyers and Phillips (1984) shown in Table 3.8. Goods are classified by the factor used most intensively or that which determines the location of products. Physical capital is not included as a separate category following Krause (1982). Krause assumes that physical capital is relatively mobile and it is the technology embodied in the capital that will determine production location rather than the capital itself (most goods normally classified as being capital-intensive are classified here as being technology-intensive). In other words, factors such as the degree of standardization of the technology in the production process are a more important determinant of production location. The exclusion of physical capital as a separate category combined with the inclusion of natural resources helps to remove some of the problems of factor reversal. This classification scheme was selected for the ASEAN countries because of the importance of natural resource-intensive products which also involve capital-intensive production processes. It is clearly the abundance of the natural resource rather that the abundance of capital that determines location in these cases.

3. Export specialization of ASEAN countries

A simple test of correlation between the export specialization indices of the ASEAN countries at the 3-digit level of disaggregation

Table	3.	8
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Economic Categories by Factor Content

Commodity	SITC, revised	SII Commodity revi	C, Lsed
Agricultural resource-intensiv	e goods	<u>Human capital-intensive goods</u>	
Food and live animals	0	Dyes, tanning, color products	53
Beverages and tobacco	1	Perfume, cleaning, etc. products	55
Hides, skins, furs undressed	21	Rubber manufactures n.e.s.	62
Oil seeds, nuts, kernels	22	Paper, paperboard manufactures	64
Crude and synthetic rubber	23	Steel 672	-679
Wood and lumber and cork	24	Metal manufactures n.e.s.	69
Pulp and waste paper	25	Telecommunications equipment	724°
Textile fibers	26	Domestic electric squipment	725
Crude animal and vegetable		Railway vehicles	731
matter n.e.s.	29	Road motor vehicles	732
Animal, vegetable oil, fat	4	Road vehicles nonmotor	733
Leather, dressed fur, etc.	61	Watches and clocks	864
Wood, cork manufactures n.e.s.	63	Sound recorders, producer	891
		Printed matter	892
Mineral resource-intensive goo	ods	Works of art. etc.	896
Crude fertilizer, minerals n.e	<b>5.5</b> . 27	Gold, silverware, jewelry	897
Metalliferous ores, scrap	28		
Minerals, fuels, etc.	3	Technology-intensive goods	
Nonmetal mineral manufactures	661-663	Chemical elements, compounds	51
Pearl. precious and semi-preci	Lous	Coal, petroleum, etc. chemicals	52
stones	667	Medicinal, etc. products	54
Pig iron, etc	671	Fertilizers, manufactured	56
Nonferrous metals	68	Explosives, pyrotechnical	
		products	57
Unskilled labor-intensive good	ds	Plastic materials, etc.	58
Textile varn, fabric, etc.	65	Chemicals n.e.c.	59
Glass	664-666	Machinery, nonelectric	71 <sup>b</sup>
Ships and boars	735	Electric nower machinery	. –
Plumbing besting lighting		switchgear	722
equivment	81	Electric distribution machinery	723
Furniture	82	Flectro-medical yoray equipment	726
Travel code bandbage	83	Flactrical machinery D a 5	729
Clathing	84	Airoveft	734
Footboar	25	Tretwinente conovetue	861
Articles of pleasie p.e.s.	803	Photo circos cumpling	862
Articles of plastic n.e.s.	073	Prioto, cinema supplies	863
loys, sporting goods, etc.	074	neveroped cinema titm	005
UTICE SUPPLIES D.C.S.	CK0		
Uther manufactured goods,	877		
war, firearms, ammunition	A21		

NOTES:

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a. In Krause (1982), commodity 7249 (included here) was classified as a technology-intensive good.

b. In Krause (1982), commodity 7199 (included here) was classified as a human capital-intensive good. c. In Krause (1982), commodity 7294 (included here) was classified as a human

capital-intensive good.

Source: Tyers and Phillips (1984).

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shows a strong positive relationship. The Spearman rank correlation coefficients are high and significant at the 1 percent level, ranging from between 86 and 99 (Table 3.9).

Nonetheless, even the broad classification scheme used shows that there is a great deal of diversity in the region. Table 3.10 shows that in the 1983-4 period, the exports of Indonesia and Malaysia were highly specialized in agricultural and mineral resource-intensive goods (primarily fuels). Agricultural goods were also competitive exports of the Philippines and Thailand, though mineral resource-intensive goods were not. Instead, the export specialization indices in unskilled labor-intensive commodities were high in both countries. Singapore's indices of export specialization, like those of Indonesia and Malaysia, were highest in mineral resource-intensive commodities. Singapore also had a stronger showing in technology-intensive commodities than did the other ASEAN countries.

Looking at the export specialization indices when considering intra-ASEAN trade as the base did not change the results much except in the case of the Fhilippines and Singapore. The Fhilippines was not competitive in unskilled-labor intensive goods relative to the other countries in the region. Its strongest performance was in agriculturaland technology-intensive goods, though the overall low indices of the Philippines are indicative of the small degree and more divisified nature of its trade with the other ASEAN countries. In contrast, the importance of Singapore in the region is clear in its extremely high export specialization indices in all areas with the exception of agriculture.

# Table 3.9

	Similarity of export specialization indices		
	Total	Manufacturing	
Indonesia-Malaysia	.9974	.9715	
Indonesia-Philippines	. 9998	.9747	
Indonesia-Singapore	. 9998	.9690	
Indonesia-Thailand	.8659	.9677	
Malaysia-Philippines	.9973	.9974	
Malaysia-Singapore	.9975	.9991	
Malaysia-Thailand	.8644	.9974	
Philippines-Singapore	. 9978	.9972	
Philippines-Thailand	. 8779	.9970	
Singapore-Thailand	.8658	.9982	

# Similarity of Export Specialization Indices<sup>a</sup> of ASEAN Countries

NOTE:

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a. Spearman rank correlation coefficients.

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#### Table 3.10

#### Export Specialization<sup>®</sup> of ASEAN Countries by Industry Factor Intensity,<sup>b</sup> 1983/84 Average

	Agricultural resource-intensive		Mineral resource-intensive		Unskilled labor-intensive		Human capital-intensive		Technology- intensive	
	% of total trade	Export- special- ization index	1 of total trade	Export- special- ization index	X of trade trade	Export- special- ization index	X of total trade	Export- special- ization index	% of total trade trade	Export- specific index index
World trade			<u> </u>							<u></u>
Indonesia	16.87	1.08	78.45	3.17	1,95	0.20	0.52	0.03	1.25	0.05
Maleysia	40.91	2.62	34.63	1.40	4.09	0.42	1.40	0.07	16.34	0.65
Philippines	38.71	2.48	11.95	0.48	11.61	1.19	1.19	0.06	7.16	0.29
Singapore	13.50	0.86	34.58	1.40	7.75	0.79	5.60	0.28	24.02	0.96
Thailand	62.10	3.98	9.76	0.39	15.93	1.63	3.19	0.16	2.69	0.11
Trade with ASEAN	1									
Indonesia	19.01	1.09	64.77	1.29	1.95	0.48	2.07	0.39	6.94	0.41
Malaysia	27.77	1.59	54.12	1.07	3.10	0.76	2.49	0.47	10.63	0.62
Philippines	10.92	0.62	4.32	<b>0.09</b>	1.82	0.44	1.68	0.32	10.36	0.60
Singapore	6.05	0.35	51.06	1.01	4.96	1.22	8.31	1.56	26.59	1.55
Thailand	60.13	3.43	3.89	0.08	8.18	2.00	4.50	0.85	6.91	0.40

NOTE:

a. Export specialization index defined as:  $(X_{ij}/X_j)/(X_{im}/X_w)$ 

a. Export spectalization index defined as: (X<sub>1</sub>/X<sub>1</sub>)/(X<sub>10</sub>/X<sub>10</sub>) where X<sub>1</sub> = exports of commodity i by country j, X<sub>1</sub> = total exports of country j, X<sub>10</sub> = exports of commodity i in world (ASEAN), X<sub>10</sub> = total world (ASEAN) exports.
b. Industrial classification shown in Table 3.8.

Sources: United Nations, Commodity Trade Statistics, 1983 and 1984.

The export specialization indices even at these high levels of aggregation show complementarities and for the most part correspond to the export patterns that would be predicted by the factor endowments of the respective countries. The major exception of course is the importance of primary commodities in Singapore's trade pattern, reflecting its role as a processing center of the region rather than an abundance of resources.

Looking more specifically at export specialization indices and intra-ASEAN trade patterns at the two- and the three-digit level, complementarities are even more pronounced (Table 3.11 and Tables 3.21 and 3.22 in Appendix C).

Agriculture and food products. The emphasis on aquaculture development in the region is clearly reflected in the export specialization patterns. All of the countries with the exception of Singapore have high export specialization indices or are at least net exporters of prepared fish and crustaceans. Singapore's imports from other ASEAN countries make up between 10 and 50 percent of Singapore's total imports of these items. Malaysia is also an important importer of fresh and dried fish from the region. It does not seem likely that regional trade in aquaculture will have much room for expansion.

Nonetheless, there appears to be several commodities where export specialization is limited to one or two countries in the region. Thailand and to a lesser extent, the Philippines, as would be expected, has the strongest export specialization of agriculture and food products in the region. Thailand is the only significant exporter of eggs (SITC 025) and cereals--especially rice (SITC 042), maize (SITC 044),

SITC	Country							
	ASEAN-5	Indo- nesia	Malay- sia	Phil- ippines	Sing- apore	Thai- land		
0	1.04	0.60	0.40	1.95	0.48	5.21		
00	0.14	0.01	0.37	0.14	0.10	0.25		
01	0.13	0.04	0.01	0.01	0.13	0.74		
02	0.13	0.00	0.14	0.04	0.23	0.20		
03	1.83	1.27	0.93	2.81	0.71	9.03		
04	1.02	0.04	0.09	0.08	0.44	8.97		
05	1.44	0.15	0.34	4.61	0.45	9.18		
06	1.23	0.16	0.20	8.64	0.05	5.65		
07	1.74	3.21	1.13	1.29	1.32	0.42		
08	0.63	0.50	0.55	1.66	0.29	1.65		
09	0.71	0.05	1.01	0.69	0.75	1.98		
1	0.36	0.21	0.08	0.67	0.39	1.08		
11	0.18	0.00	0.14	0.10	0.42	0.04		
12	0.54	0.43	0.01	1.30	0.35	2.22		
2	1.85	1.32	3.82	2.10	1.06	1.83		
21	0.25	0.42	0.00	0.00	0.28	0.34		
22	0.18	0.08	0.16	0.33	0.22	0.31		
23	11.91	9.22	22.68	0.23	8.70	17.02		
24	3.74	1.83	12.66	4.63	0.78	0.07		
25	0.08	0.03	0.00	0.40	0.13	0.03		
26	0.18	0.01	0.19	0.73	0.12	0.49		
27	0.33	0.16	0.31	0.20	0.31	1.09		
28	0.86	0.86	0.46	4.53	0.46	0.44		
29	1.26	1.46	0.15	0.96	1.25	3.40		
3	2.06	3.97	1.56	0.10	1.69	0.03		
32	0.06	0.11	0.11	0.00	0.01	0.00		
<b>3</b> 3	2.07	3.71	1.57	0,11	1.93	0.03		
34	2.91	8.25	2.11	0.05	0.21	0.06		
4	6.91	1.16	20.89	16.72	3.12	0.35		
41	0.10	0.02	0.00	0.36	0.19	0.02		
42	8.75	1.13	27.78	22.73	3.15	0.36		
43	4.20	2.31	6.63	2.61	5.63	0.61		
5	0.27	0.09	0.13	0.23	0.57	0.12		
51	0.27	0.03	0.05	0.52	0.60	0.07		
52	0.13	0.09	0.12	0.07	0.21	0.06		
53	0.21	0.09	0.06	0.06	0.44	0.15		
54	0.29	0.07	0.14	0.14	0.62	0.19		
55	0.45	0.46	0.26	0.14	0.66	0.27		
56	0.41	0.45	0.02	0.02	0.81	0.01		
57	0.32	0.00	0.13	0.25	0.81	0.00		
58	0.21	0.00	0.08	0.13	0.50	0.17		

# Export Specialization Index for the ASEAN-5 Countries with Respect to the World, 1983/84 Average<sup>a</sup>

Table 3.11

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	Country							
SITC	ASEAN-5	Indo- nesia	Malay- sia	Phil- ippines	Sing- apore	Thai- land		
59	0.39	0.01	0.39	0.26	0.81	0.11		
6	0.53	0.44	0.51	0.47	0.47	1.08		
61	0.15	0.09	0.06	0.02	0.04	1.00		
62	0.28	0.01	0.44	0.05	0.35	0.70		
63	4.48	8.44	3.01	6.50	2.22	2.17		
64	0.12	0.04	0.05	0.02	0.25	0.09		
65	0.54	0.27	0.41	0.29	0.53	1.86		
66	0.42	0.06	0.18	0.24	0.37	2.36		
67	0.13	0.01	0.04	0.18	0.27	0.13		
68	1.14	1.00	1.95	1.03	0.63	1.72		
69	0.25	0.00	0.15	0.10	0.52	0.34		
7	0.52	0.03	0.61	0.22	1.02	0.22		
71	0.23	0.00	0.22	0.01	0.54	0.01		
72	0.27	0.00	0.16	0.05	0.65	0.13		
73	0.16	0.00	0.06	0.02	0.43	0.03		
74	0.37	0.06	0.18	0.02	0.87	0.17		
75	0.51	0.00	0.04	0.01	1.44	0.03		
76	0.89	0.01	0.70	0.14	2.13	0.04		
77	1.69	0.13	3.05	1.25	2.42	1.17		
78	0.04	0.00	0.02	0.06	0.10	0.02		
79	0.48	0.00	0.39	0.01	1.15	0.03		
8	0.57	0.15	0.33	1.25	0.69	1.36		
81	0.21	0.02	0.13	0.20	0.33	0.53		
82	0.54	0.04	0.11	2.90	0.58	1.10		
83	0.50	0.01	0.03	1.01	0.59	2.37		
84	1.11	0.49	0.77	2.56	0.95	3.27		
85	0.38	0.03	0.20	1.59	0.13	1.87		
87	0.25	0.00	0.17	0.02	0.58	0.21		
88	0.29	0.02	0.17	0.15	0.63	0.31		
89	0.48	0.09	0.24	0.97	0.76	0.82		
9	2.16	0.42	0.11	12.94	3.06	0.69		
91	0.61	0.34	0.18	0.00	1.39	0.00		
93	3.74	0.72	0.14	22.88	5.22	1.21		
94	0.55	0.00	0.66	1.54	0.42	1.77		
95	0.00	0.00	0.01	0.00	0.00	0.02		
96	0.06	0.00	0.00	0.40	0.09	0.00		
97	0.09	0.00	0.09	0.09	0.20	0.00		

# Export Specialization Index for the ASEAN-5 Countries with Respect to the World, 1983/84 Average<sup>4</sup>

Table 3.11 (continued)

NOTE:

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a. Singapore's trade with Indonesia was derived using Indonesian data. <u>Sources</u>: United Nations, <u>Commodity Trade Statistics</u>, 1983 and 1984.

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and flour and other cereal preparations (SITC 045 and 047). The Philippines has a strong specialization in exports of fruits and nuts (SITC 071), including bananas, pineapples, and coconuts. And along with the Philippines, Thailand is a strong exporter of vegetables (SITC 05), and sugar (SITC 06). The other ASEAN countries are net importers of these goods in most cases but a negligible share of their imports of these goods comes from either the Philippines or Thailand at this time.

Thailand, on the other hand, is the only country without a comparative advantage in fixed vegetable oils (SITC 42). Its imports of palm oil, however, largely come from Malaysia, making it unlikely that import would expand much with preferential tariffs. Beverages (07) is another category where Thailand has low RCAs relative to the other countries, although it is a net exporter of coffee. Indonesia is a strong exporter of beverages, including coffee (SITC 071) and tea (SITC 074), while Malaysia and the Philippines have a comparative advantage in cocoa (SITC 072). Thailand's imports of tea come largely from Hong Kong but it does purchase most of its cocoa from other ASEAN countries.

Although imports of food items, especially rice, tend to be politically sensitive, there exists a large potential for increased trade in these goods. Clearly, exports of Thailand and the Philippines can be expected to increase with liberalization of import barriers in agricultural products and food items.

<u>Nonfood primary commodities</u>. There appears to be less opportunities for trade expansion in nonfood commodities. The Philippines and Thailand specialize in the export of tobacco (SITC 121),

and feeding stuff for animals (SITC 081). Indonesia is also a large exporter of tobacco. There is some prospects for an increase in tobacco exports to Singapore and Malaysia with tariff reductions, but the bulk of imports of animal feed in Indonesia, Malaysia, and Singapore already comes from Thailand. The Philippines is the only country in the region which does not have a comparative advantage in crude rubber (SITC 23) and tin (SITC 687) but it is a net exporter of natural rubber and imports synthetic and reclaimed rubber from the United States and already imports most of its tin from other ASEAN countries. Thailand is an important world exporter of jute (SITC 264) while the Philippines exports hemp and other vegetable textile fibers (SITC 265) but imports of the other ASEAN countries already are largely from Thailand in the case of jute and are very small in the case of vegetable fibers. The same can be said for other important commodity items such as copper ores and precious minerals. Indonesia and Malaysia have strong comparative advantage in petroleum products (largely crude petroleum) and natural gas while Singapore exports refined petroleum. About 40 percent of Thailand's imports of petroleum (SITC 33) come from other ASEAN countries (including Brunei), but the ratio is less than 20 percent for the Philippines. Expansion in petroleum trade in the region is unlikely because of supply constraints as well as quality differentials. Overall, prospects for trade expansion in non-food commodities do not appear to be very optimistic.

<u>Manufactures</u>. The potential for increase in intra-ASEAN trade in manufactures is larger than for other goods, although there are industries where expansion is unlikely. In particular, all of the

countries have comparative advantage relative to the rest of the world in cork and wood manufactures (SITC 63), and in fact, these are the strongest exports of the countries in most cases. Thus it is unlikely that intra-regional trade in these goods will expand significantly. Clothing (SITC 84) and textiles (SITC 65) are somewhat more promising, with the Philippines and Thailand as the largest exporters in most categories. But clothing and textiles are important manufactured exports in several categories for Indonesia and Malaysia as well, especially when only manufactured goods are considered. The prospects for expanded intra-regional trade in clothing and textiles are at best uncertain. An examination of the levels of protection presently accorded to these industries may give a better indication. This is presented in Section V of this chapter.

Although presently, all of the countries with the exception of Indonesia are large exporters of some categories of electrical machinery (SITC 772 and 776), intra-regional trade in these sectors is large and may continue to expand. There is some evidence that intra-industry trade in these sectors has been growing. This will be examined in the following section.

Indonesia is the only country with a comparative advantage in several chemical products, and paper and paper products. Yet, except for 11 percent of Singapore's imports of essential oils and perfume materials (SITC 55) and nearly 20 percent of Philippines' imports of fertilizers (SITC 56), Indonesia makes up a negligible share of ASEAN imports of these goods. Exports to ASEAN does, however, account for about 50 and 75 percent of Indonesia's exports of SITC 55 and 56,

respectively. A similar situation exists for Indonesia's exports of paper goods. The small Indonesian share in the imports of these commodities may be primarily supply related, i.e., an inability of Indonesia to produce more. If this is true, the reduction of tariff barriers may not increase Indonesia's exports of these goods to the other ASEAN countries. More intensive investigation is needed in these sectors to determine whether or not trade will expand in these industries. Are constraints supply or demand determined?

Malaysia's manufactured exports are concentrated in machinery and equipment. It is a strong exporter in SITC 718 (other power and generating equipment) with a large share of exports going to the EC. Malaysia, along with Singapore, is also a significant exporter of electrical and electronic equipment such as television and radio broadcast receivers (SITC 761 and 762) and electrical power equipment (SITC 771). The other ASEAN countries primarily import these goods from the developed countries. Malaysia is also an important exporter of rubber manufactures (SITC 621) and, along with Thailand, specializes in the export of rubber articles (SITC 628) when only manufactures are considered. Imports of these goods by other ASEAN countries largely come from developed countries.

The Philippines, along with Thailand, is an important exporter of furniture (SITC 793) and travel goods and handbags (SITC 831). When only manufactured products are considered, two categories of chemicals (SITC 512 and 513) and plastic products (SITC 893) are important export items for the Philippines. All of the above goods are imported by other ASEAN countries primarily from developed countries.
Singapore, as the most industrialized country in the region, specializes in many categories of nonelectrical and electric equipment that are not yet important export items of the other countries. These products (e.g. SITC 716, 723, 743, 751, 752, 759, 763, 775, and 778) are exported by Singapore to developed countries, while the imports of the other ASEAN countries in these goods are primarily from developed countries.

Thailand appears to have the most diversified export structure with comparative advantage in a wide range of light manufactures. It is the only ASEAN country with comparative advantage in leather manufactures (SITC 612), rubber articles (SITC 628), some textile products (SITC 651, 652, 653, and 658) and nonmetallic mineral manufactures, but its exports to other ASEAN countries comprise a small share of its total exports. Additionally, except for a few cases, they account for a small share of ASEAN imports of these goods. The potential for the expansion of regional trade in many of these goods, however, is also uncertain as the other ASEAN countries also tend to be net exporters of these goods.

The examination of export specialization indices of the ASEAN countries shows that there are important export categories where complementarity in export structures presently exists. It does not, however, give any indication of whether or not potential for expanding trade exists in other industries or why exports to other ASEAN countries are small even where complementarities do exist. The next sections may provide some answers to these questions.

### IV. Intra-industry Trade"

The offsetting factor to what is considered to be the inherent lack of complementarity among developed countries could be the potential for intra-industry trade a la Linder (1961). Linder hypothesized that intra-industry trade should be larger among countries with similar levels of income and taste, and geographical proximity. Others have also suggested that political ties may contribute to greater trade links.

These factors would suggest that the potential for intra-industry trade among ASEAN countries would be high. Disparity in levels of income in ASEAN was discussed earlier in this chapter, but the ASEAN countries are all upper or middle income developing countries (although Singapore may be considered to have graduated to high income status). Further, the political ties through ASEAN, the geographical proximity the language similarity among a few of the countries (in terms of both Malay and Chinese), should contribute to extensive Linder trade. However, Linder stresses the role of product differentiation between goods and monopolistic competition as the trade-creating factor. Industrial sectors must be sufficiently advanced to permit production of goods amenable to product differentiation. Therefore, it has been suggested (Kleiman and Kop 1984) that intra-industry trade may not be important for developing countries. It will be useful, therefore, to examine the occurrence of such trade in ASEAN.

A. Methodology

One measure of intra-industry trade commonly used is discussed in one of the first books on the subject, Grubel and Lloyd (1975).<sup>12</sup>

Intra-industry trade is defined as the value of exports of an industry which is offset by the imports of the same industry. It is calculated by subtracting net exports of an industry from the total trade. In other words, according to this measure, the closer the value of exports and imports are, the greater the degree of intra-industry trade. Net exports will thus be closer to zero and the intra-industry trade will be larger. Dividing this number by a countries' total trade facilitates cross country comparisons. In symbols:

 $R_i = ((X_i + M_i) - |X_i - M_i|)/(X_i + M_i) * 100;$ 

where:  $R_i$  = the Grubel-Lloyd index;

 $|X_i-M_i|$  = inter-industry trade in industry i;

 $(X_i+M_i) = total trade.$ 

When X = M then B = 100; if X = 0 or M = 0 then B = 0.

B. Survey of Empirical Results

The high level of intra-industry trade and its increase over time has been documented by Balassa (1966) and Grubel and Lloyd (1975). Earlier empirical work on intra-industry trade among industrial countries found that the highest degree of such trade occurred in chemicals, machinery and transport equipment, miscellaneous manufactures, and least in basic manufactures. Havrylyshyn and Civan (1985) also found a broadly similar pattern in the intra-industry trade of the NICs. In other words, intra-industry trade was more likely to be found in trade in capital and intermediate goods. Specifically, they found the products which have the highest levels of intra-industry trade are organic chemicals, office machines, machinery of various types, and primary forms of iron and steel. Large export items of the

NICs--clothing, footwear, toys and sporting goods, handbags, and glassware--tended to have low levels of intra-regional trade, although intra-industry trade for textile yarns and fabrics were relatively high. They also found that intra-industry trade tends to be much higher at higher levels of development; it accounts for about 60 percent of total trade for developed countries, about 40 percent of total trade for the NICs, and about 15 percent for non-NIC developing countries.

C. Intra-industry Trade of ASEAN Countries

Intra-industry trade as measured by the Grubel-Lloyd index is an important element of trade of the individual ASEAN countries. The aggregate index for intra-industry trade is the highest for Singapore, at 75 percent. Malaysia is next with 45 percent, the Philippines and Thailand follow with about 25 percent, and Indonesia has the least with less that 10 percent. This follows previous findings that link the degree of intra-industry trade and income. Additionally, as theory would also predict, the most important partners are the other ASEAN countries in all cases.

Intra-industry trade among the ASEAN countries is largely bilateral between Singapore and the other countries (Table 3.12). For Indonesia, Malaysia, and Thailand, Singapore is the most important partner for intra-industry trade. Only the Philippines differs in this regard, although Singapore remains a close second to Malaysia. The intra-industry trade between Thailand and Malaysia is also significant.

Generally, intra-industry trade in ASEAN follows the patterns of intra-industry trade found in the developed countries and the NICs. The traded items are primarily intermediate and capital goods--various

# Table 3.12

		Country						
Destination	SITC	Indo- nesia	Malay- sia	Phil- ippines	Sing- apore	Thai- land		
Indonesia	541		19.7	37.7	93.2	0.0		
	562		0.0	0.8	76.4			
	762				79.8			
	764		94.7		83.2	0.0		
	899		0.0		83.2			
Malaysia	513	0.0		78.7	16.7			
	533				31.0	83.9		
	553	45.8			81.8	0.0		
	585				89.1	0.0		
	591			0.0	38.7	89.4		
	621	0.0		0.0	57.8	73.1		
	628				73.1	97.3		
	552			0.0	96.0	71.0		
	653	0.0		0.0	86.4	78.5		
	658				72.4	0.0		
	661	84.2		0.0	30.1	0.0		
	662	0.0		• • •	71.0	0.0		
	663				97.4	76.7		
	664	0.0		0.0	76.0	0.0		
	684	0.0			64.5	86.3		
	687			0.0	76.4	0.0		
	699	0.0		13.5	52.2	82.9		
	741	0.0		0.0	74.9	81.9		
	749	62.3		0.0	20.7	72.8		
	759				72.4			
	761				81.1			
	764	93.1		0.0	81.7	57.8		
	771			0.0	74.4	12.7		
	772	0.0		0.0	78.3	49.8		
	776	0.0		38.8	96.6	0.0		
	•778	0.0		68 1	61 9	97.4		
	783				86.4			
	785	76 3			56.6	0.0		
	705	/0.5			81 7			
	810				73 6	0 0		
	821				96 1	0.0		
	041 041				8/- 0	0.0		
	671 670				72 0	0.0		
	072 973				77 2	0.0		
	202			02 1	71 1	00 1		
	073		~	70.I	/ 1. 1	フフ・エ		

# Intra-Industry Indices of ASEAN Countries for Selected Commodities, 1983/84 Average<sup>a</sup>

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# Table 3.12 (continued)

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			Country					
Destination	SITC	Indo- nesia	Malay- sia	Phil- ippines	Sing- apore	Thai- land		
Philippines	541	74.9	0.0		68.2	9.0		
	553		0.0		85.2			
	625	0.0	0.0		99.2	0.0		
	651		~ * *			99.4		
	663	0.0	0.0		75.1			
	692				77.2	0.0		
	695		0.0		74.7	0.0		
	728	0.0	75.7		91.7	0.0		
	744	0.0	98.9		56.0	85.0		
	764		94.9		0.0	0.0		
	772		90.0		42.7	24.0		
	776	9.0	26.9		77.1			
	778		79.2		14.7	46.9		
	782	0.0			79.6			
	842		81.6		0.0			
	874		94.0		22.2	0.0		
	894	0.0	50.4		93.7	0.0		
Singapore	512	2.0	94.1	0.0	• • •			
	513	0.0	99.5	0.0		0.0		
	533	0.0	72.0	0.0		33.0		
•	541	93.2	95.6	96.5		85.8		
•	551	68.3	75.2			93.3		
	554	10.7	74.3	0.0		26.0		
	562	76.4	44.9	0.0		0.0		
	591		77.7			68.4		
	625	17.7	23.9	76.0		0.0		
	628	0.0	80.5	0.0		88.2		
	641	23.1	90.4			36.1		
	642	18.2	83.8	0.0		57.1		
	651	48.5	75.2			0.0		
	652	0.0	71.8			8.0		
	653	1.4	78.5	0.0		0.0		
	656	8.5	72.3					
	657	40.0	84.6	0.0		18.5		
	658	63.0	88.5			1.0		
	663	3.0	31.4	73.7		0.0		
	664	22.3	72.5	10.6		77.5		
	678	0.0	77.4	0.0		18.3		
	679	0.0	92.3					
	684	33.7	94.9	11.8		0.0		
	691	1.8	84.0	33.6		12.3		

# Intra-Industry Indices of ASEAN Countries for Selected Commodities, 1983/84 Average<sup>a</sup>

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# Table 3.12 (continued)

		Country					
Destination	SITC	Indo- nesia	Malay- sia	Phil- ippines	Sing- apore	Thai- land	
	692	3.7	92.6			62.9	
	693	9.8	88.7	0.0		0.0	
	694	0.0	21.0	0.0		90.4	
	695	0.0	60.1	98.4		33.4	
	699	20.6	80.3	13.7		37.6	
	716	0.0	87.0	0.0		0.0	
	721	0.0	94.3			0.0	
	723	2.1	33.3	0.0		78.9	
	725	0.0	78.6				
	727	0.0	93.4	97.0		60.4	
	728	0.0	79.5	43.1		88.4	
	736	0.0	66.1	0.0		94.8	
	737	0.0	95.5	0.0		0.0	
	743	0.0	94.1	0.0		0.0	
	744	0.0	47.8	96.2		48.4	
	745	0.0	81.9	0.0		78.0	
	751	0.0	100.0	0.0		0.0	
	752	0.0	87.3	0.0		0.0	
	762	79.8	84.1			66.7	
	764	83.2	83.8	0.0		9.1	
	771	0.0	79.7	0.0		43.9	
	775	0.0	65.9	99.3		49.9	
	776	46.7	94.2	54.4		0.0	
	778	3.3	88.9	0.0		30.8	
	782	0.0	48.6			77.7	
	842	0.0	95.2	0.0		0.0	
	843	0.0	89.6			0.0	
	844	0.0	78.0			0.0	
	847	50.8	85.5			0.0	
	848	0.0	85.9	0.0		0.0	
	872	0.0	75.3	0.0		16.8	
	874	23.8	96.4	0.0		43.4	
	881	67.6	93.8				
	884		0.0	0.0		90.4	
	885	0.0	97.5			62.2	
	892	6.6	51.3	0.0		75.9	
	893	11 2	91 8	95.4		44.9	
	894	55 3	83 6	92 0		86 5	
	895	42 5	68 5	0.0		82.0	
	896	0.0	81 3				
	897		95 9			0.0	
	521					~.~	

# Intra-Industry Indices of ASEAN Countries for Selected Commodities, 1983/84 Average<sup>®</sup>

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### Table 3.12 (continued)

Destination	SITC	Indo- nesia	Malay- sia	Phil- ippines	Sing- apore	Thai- land
	898	3.4	75.3			
	899	83.2	82.9	0.0		0.0
Thailand	514	0.0			70.6	
	533	0.0	82.2		27.4	
	541	0.0	59.8	77.1	39.9	
	551		0.0	0.0	98.8	
	591		71.8		63.2	
	625	0.0	73.6	0.0	37.4	
	628	0.0	88.2		44.7	
	651	31.5	88.9	0.0	34.8	
	664	19.1	0.0	0.0	96.3	
	665		99.9		91.7	
	684		69.9	0.0	76.8	
	692	0.0	81.4	0.0	45.7	
	694		0.0		99.6	
	699	0.0	78.4	0.0	45.3	
	724	0.0	86.3		0.0	
	728	0.0	77.5	63.7	48.6	
	741	0.0	99.3	0.0	31.1	
	749	0.0	93.7		9.2	
	752		0.0	0.0	97.6	
	759				97.4	
	764	0.0	99.6		8.0	
	776	0.0	99.6	0.0	75.5	
	778	0.0	79.4	88.8	51.9	
	884				84.5	
·	892		91.8		62.5	

Intra-Industry Indices of ASEAN Countries for Selected Commodities, 1983/84 Average<sup>a</sup>

NOTES:

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---- Trade does not take place in this commodity between the two countries.

a.  $R_i = ((X_i + M_i) - |X_i - M_i|)/(X_i + M_i) * 100;$ 

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where: R<sub>i</sub> = the Grubel-Lloyd index; |X<sub>i</sub>-M<sub>i</sub>| = inter-industry trade in industry i; (X<sub>i</sub>+M<sub>i</sub>) = total trade.

When X = M then B = 100; if X = 0 or M = 0 then B = 0.

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Source: United Nations, Commodity Trade Statistics, 1983 and 1984.

chemicals, some rubber products such as tires, textile fibers, metals, various industrial machinery, telecommunications, and other electronic equipment. As found in the study by Havrylyshyn and Civan, there are few finished, light manufactures.<sup>13</sup> Although this may in part reflect the pattern of protection in the ASEAN as well as in other countries (as will be discussed later), it appears also to reflect the nature of these goods.

The above suggests that intra-industry trade in intermediate and capital goods can be expected to expand as industrialization, integration, and trade liberalization proceeds in ASEAN. The extent to which this will contribute to intra-ASEAN trade expansion, however, is uncertain. Havrylyshyn and Civan found that although intra-industry trade was higher in the NICs than in other developing countries, their major partners were developed countries. The NICs' percentage of intra-industry trade was lower with other NICs at 30 percent. The authors suggest that this may be due to the NICs' comparative disadvantage in capital and intermediate goods even in the markets of other NICs. For the ASEAN countries, Hong Kong and the United States are already important intra-industry trade partners of all of the ASEAN countries, and intra-industry trade with more developed partners is likely to expand more rapidly in the future than intra-industry trade with other partners. Fortunately, Singapore's more industrialized status makes prospects for continued increases in intra-industry trade in ASEAN more likely.

#### V. Prospects for Gains from Economies of Scale

Some authors (Balassa 1967, Kravis and Lipsey 1971) have argued that scale economies played an important role in the growth of trade among industrialized countries. A few empirical studies have confirmed this, finding that the effects of these dynamic sources of economic gain are significant. For example, Owen (1976), using ordinary least squares estimation found that plant size, regardless of how it was measured, had a significant effect on trade advantage in the EEC.<sup>15</sup> Industry size, however, was not significant in most cases. However, the explanatory power of the equation including relative labor productivities and differential tariffs was quite low. Owen points out that this is not surprising in a cross section study. Walters (1976) found that in the first half of the century, a doubling of inputs in the U.S. non-agricultural sector was accompanied by a 130 percent increase in output due to economies of scale and intensified competition in a wider market. Further, he argued that the exploitation of economies of scale may have led to new investment, raising the consideration of a multiplier effect. These empirical estimates would lead one to believe that benefits from economies of scale may be far larger than gains and losses from trade creation and trade diversion. Other studies (Scherer et al. 1975) have shown that in most industries, scale economies are modest.

### A. Empirical Considerations

To measure economies of scale, two important components must be considered.<sup>18</sup> The first is the absolute capital requirement of the barrier to entry which is usually looked at in terms of the size of the

minimum efficient scale (MES). The second is the cost disadvantage barrier, i.e., what is the cost disadvantage of entry at less than the MES?

Previous empirical studies have employed several ways to measure economies of scale. The average cost curve of the firm can be measured using engineering evidence. But only a few studies have attempted to directly measure economies of scale based on engineering or survey evidence. These studies, including Pratten (1971), Scherer et al. (1975), Weiss (1976), provide an indication of what industries can be expected to have large gains through scale economies.

Scherer et al. (1975) found that although the minimum efficient scale of operating was high in several industries, the cost disadvantage of producing at only one-third of the MES was greater than 10 percent only in a few cases, including glass bottles, cement, and integrated steel. In two other studies (Pratten 1971 and Weiss 1976), the cost disadvantage of producing at one-half of MES was found to exceed 10 percent in bricks, some kinds of paper, synthetic rubber, noncelulosic man-made fibers (nylon, acrylic, and polyester fibers), iron foundries casting cylinder blocks, electric motors, and commercial transport aircraft.

Most other studies have employed various statistical proxies for MES because of the difficulty of obtaining engineering evidence. Weiss (1976) ranked the size of plants and selected the plant size accounting for the 50th percentile of shipments to approximate MES. Comanor and Wilson (1967) chose the average size of the largest plants accounting for 50 percent of all shipments.

Caves et al. (1975) and Fuss and Gupta (1981) go beyond estimating MES and also look at the cost disadvantage of producing below MES. Both papers argue that under certain assumptions, the variation of value-added per worker with scale of establishment will provide an inverse measure of the variations in average unit cost.<sup>10</sup> As a rough indicator of diseconomies of small scale, Caves et al. calculated a so-called cost disadvantage ratio defined as the value added per unit of labor for smallest firms accounting for 50 percent of net output by the value added per unit of labor for the larger 50 percent. The cost disadvantage ratio was then allowed to interact with an estimate of MES to total output calculated following Weiss (1976) as described above. They found that a large MES is a source of barriers to entry only when the cost disadvantage is significant (at least 10 percent and possibly even 20 percent). Fuss and Gupta (1981) employed regression analysis to determine the shape of cost curves and these cost curves were then used to determine MES. They estimated cost disadvantage to be generally lower than the engineering estimates. All were less than 10 except in cement.

### B. Economies of Scale and ASEAN

Data by firm size are not available for all ASEAN countries, and thus cost disadvantage ratios and the estimates of MES could not be calculated. However, a modified version may provide some indication of MES and the cost disadvantage of producing at less than MES in each country. Average output per firm in the United States was used as an approximation of MES, and divided by the total output in the individual countries to get MES to total output ratios. The cost disadvantage

ratio was calculated using average value-added per worker in various industries across the ASEAN countries with U.S. value-added per worker as a base. This assumes that the average U.S. value-added per worker will approximate production cost at MES and that production technology is the same across countries. Ideally, this should be done using highly aggregated industrial data but by necessity was calculated at the ISIC 3 and 4 digit level because of data availability. The cost disadvantage ratio is then compared with average net output divided by the number of firms and expressed as a percentage of output per establishment in the United States. Data are from the United Nations, <u>Industrial Statistics</u> <u>Yearbook</u>. Data for Thailand were not available.

As can be seen in Table 3.13, the average output of U.S. firms is larger than that of ASEAN countries indicating that the firms in ASEAN countries may be operating at less than the minimum efficient scale. Correspondingly, value added per worker (VAPW) is significantly lower in ASEAN countries than in the United States in most industries (Table 3.14) and the cost disadvantage ratio is generally significantly lower than 80-90 percent, meaning that obtaining a high MES may be an important barrier to entry.

Malaysia's cost disadvantage ratios are higher than those of other ASEAN countries and correspondingly the scale of production is generally larger in Malaysia. Industries with relatively small average output per establishment, large MES relative to total output, and low cost disadvantage ratios include tobacco (ISIC 314), leather products and footwear (ISIC 323 and 324), pulp and paper (ISIC 3411), synthetic resins (3513), drugs and medicines (ISIC 3522), petroleum and coal

Table 3.1
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	Indonesia		Malay	Malaysia		Philippines		Singapore		United States	
ISIC	Output/ firm	MES/ output									
3	1.688	0.000	3.139	0.000	2.413	0.000	0.451	0.004	5.780	0.000	
311	1.252	0.006	3.950	0.003	2.184	0.004	0.196	0.213	12.369	0.000	
313	1.633	0.089	3.716	0.064	8.526	0.020	0.729	1.413	15.440	0.000	
314	3.902	0.044	20.622	0.234	23.883	0.153	0.560	35.245	98.773	0.006	
321	0.838	0.003	2.679	0.008	2.230	0.006	0.413	0.127	4.389	0.000	
3211	5.854	0.021	4.454	0.022	4.624	0.018	0.837	0.348	9.597	0.000	
322	0,734	0.017	1.209	0.009	0.732	0.008	0.063	0.098	2.411	0.000	
323	0,900	0.060	0.370	0.277	0.314	0.144	0.019	3.093	2.258	0.001	
324	0.915	0.116	0.877	0.609	0.237	0.188	0.035	3.259	6.140	0.001	
331	1.799	0.002	1.417	0,002	1.257	0.004	0.239	0.063	1.620	0.000	
332	0.131	0.092	0.247	0.020	0.246	0.023	0.100	0.124	1.668	0.000	
341	1,984	0.079	1.413	0.084	3.724	0.035	0.256	0.563	12.537	0.000	
3411	3.423	0.218	2.169	1.839	9.320	0.135	na	na	33.904	0.001	
342	0.487	0.011	1.537	0.004	0.397	0.012	0.083	0.060	1.607	0.000	
351	5.415	0.035	13.668	0.023	5.094	0.052	2.166	0.209	24.047	0.000	
3511	1.381	0.225	22.781	0.029	2.821	0.164	na	na	23.608	0.000	
3513	0.277	12.929	3.493	1.269	6.512	0.357	na	na	46.535	0.002	
352	2.074	0.013	2.693	0.025	4.587	0.011	0.337	0.317	9.355	0.000	
3522	2.053	0.063	1.471	0.452	5.746	0.059	na	na	19.282	0.001	
353	na	na	176.016	0.288	800.520	0.190	35.242	2.254	456.813	0.002	
354	na	na	1.674	0.188	1.738	0.386	35.242	0.025	5.029	0.001	
355	3.637	0.013	5.063	0.008	1.758	0.055	0.194	1.135	10.134	0.001	

Average Firm Size and Minimum Efficient Scale, 1983/84 Average (US\$ millions and shares)

### Table 3.13 (continued)

## Average Firm Size and Minimum Efficient Scale, 1983/84 Average (US\$ millions and shares)

	Indon	esia	Malay	sia	Philip	pines	Singa	pore	United	States
ISIC	Output/ firm	MES/ output								
356	0.683	0.016	1.011	0.013	1.301	0.017	0.330	0.044	3,167	0.000
361	1,212	0.057	1,171	0.091	1.189	0.090	1.004	0.343	1.978	0.001
362	3.439	0.055	4.250	0.094	4.366	0.061	1.004	1.171	6.756	0.001
369	0.754	0.005	1.675	0.004	0.578	0.021	0.999	0.024	2.229	0.000
371	32.588	0.020	4.099	0.028	7.061	0.021	8.618	0.123	15.913	0.000
372	na	na	37.113	0.019	2.070	0.161	0.352	1.815	12.137	0.000
381	1.650	0.005	1.097	0.006	0.931	0.012	0.214	0.033	3.071	0.000
382	1.052	0.026	0.816	0.010	0.289	0.040	0.192	0.055	3.653	0.000
3825	na	na	0.662	5.479	0.268	10.656	na	na	19,963	0.000
383	5.544	0.014	12.409	0.003	4.994	0.013	0.825	0.035	9.111	0.000
3832	7.361	0.038	23.016	0.004	na	0.016	0.989	0.058	9.884	0.000
384	4.111	0.025	2.669	0.034	2.143	0.056	0.371	0.202	20.278	0.000
3841	1.667	0.061	1.885	0.045	0.739	0.195	0.352	0.069	5.183	0.000
3843	11.832	0.042	3.142	0.072	5.813	0.218	0.100	9,197	26.615	0.000
385	0.129	1.782	3.980	0.090	1.277	0.529	0.401	0 348	6 414	0 000
390	0.509	0.033	0.778	0.017	0.413	0.030	0.083	0.139	1.646	0.000

Sources: United Nations, Industrial Statistics Yearbook, 1984 and	ind 1985	
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		Country					
ISIC	Commodity	Indonesia	Malaysia	Philippines	Singapore		
3	Manufacturing	0.07	0.19	0.13	0.34		
311	Food products	0.04	0.19	0.11	0.27		
313	Beverages	0.11	0.24	0.20	0.33		
314	Tobacco	0.02	0.18	0.05	0.25		
321	Textiles	0.07	0.17	0.12	0.32		
3211	Spinning, weaving, etc.	0.10	0.19	0.18	0.31		
322	Wearing apparel	0.08	0.14	0.07	0.28		
323	Leather & products	0.16	0.18	0.07	0.24		
324	Footwear	0.15	0.12	0.08	0.29		
331	Wood products	0.07	0.16	0.09	0.35		
332	Furniture, fixtures	0.04	0.14	0.06	0.27		
341	Paper & products	0.04	0.12	0.15	0.32		
3411	Pulp, paper, etc.	0.03	0.09	0.18	na		
342	Printing, publishing	0.05	0.21	0.08	0.35		
351	Industrial chemicals	0.10	0.85	0.15	0.33		
3511	Basic chemicals,	0.04	1,49	0.11	na		
	excl. fertilizers						
3513	Synthetic resins, etc.	0.03	0.13	0.21	na		
352	Other chemical products	0.04	0.15	0.14	0.56		
3522	Drugs & medicines	0.03	0.09	0.11	T.E.		
353	Petroleum refineries	THE	0.58	1.73	0.97		
354	Petroleum, coal products	114	0.16	0.09	1.96		
355	Rubber products	0.06	0.19	0.09	0.26		
356	Plastic products	0.04	0.13	0.12	0.28		
361	Pottery, china, etc.	0.04	0.17	0.14	0.45		
362 -	Glass & products	0.10	0.24	0.14	0.33		
369	Non-metal products	0.09	0.25	0.08	0.50		
371	Iron & steel	0.54	0.26	0.39	0.72		
372	Non-ferrous metals	tia.	0.29	0.18	0.53		
381	Metal products	0.09	0.18	0.11	0.38		
382	Machinery	0.09	0.18	0.06	0.37		
3825	Office, computing, etc.	11.8	0.24	0.04	na		
383	Electrial machinery	0.08	0.17	0.11	0.31		
3832	Radio, television, etc.	C.07	0.16	0.13	0.26		
384	Transport equipment	0.09	0.18	0.08	0.28		
3841	Shipbuilding, repair	0.14	0.23	0.08	0.35		
3843	Motor vehicles	0.10	0.18	0.09	0.16		
385	Professional goods	0.02	0.09	0.04	0.21		
390	Other industries	0.04	0.13	0.07	0.28		

Table 3.14 Cost Disadvantage Ratio, 1983/84 Average\*

NOTE:

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na = Not available. a. VA<sub>a</sub>/Em<sub>a</sub>

VAD. /Em.

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where  $VA_a$ ,  $VA_{aa}$  - value added of the ASEAN countires and the United States, respectively, and

Em<sub>a</sub>, Em<sub>a</sub> = total employees in the industry of the United States and ASEAN countries, respectively.

Sources: United Nations, Industrial Statistics Yearbook, 1984 and 1985.

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(ISIC 353 and 354), and office and computing machines (3825). However, establishments in Malaysia produced larger or similar amounts of output in several sectors, including printing (ISIC 342), basic chemicals (ISIC 3511), pottery (ISIC 361), nonferrous metals (ISIC 372), and electrical machinery (ISIC 361), nonferrous metals (ISIC 372), and electrical machinery (ISIC 383 and 3832). But Malaysia's cost disadvantage ratio is close to that of the United States only in one case, ISIC 3511. This implies that other factors besides scale are important; in Malaysia's case it would appear that establishments are less efficient overall and may also reflect a mix of inefficient and efficient large and small scale production processes within a given industry.

In Indonesia and the Philippines cost disadvantage ratios were low in all industries, though the scale of production was similar to that of the United States in a few cases. MES did not account for a large share of production in Indonesia except in a few cases, notably pulp and paper (ISIC 3411), basic chemicals excluding fertilizers (ISIC 3511), synthetic resins (ISIC 3513), and professional goods (ISIC 385). These same industries, in addition to a few machinery industries, had large MES to total output ratios in the Philippines as well.

Singapore's VAPW is the closest to that of the United States averaging 34 percent of the U.S. ratio for manufacturing as a whole, while more often than not, it has the smallest scale of production. Firm size in petroleum and coal products (ISIC 354) is larger in Singapore than in the United States and more efficient, and therefore the cost disadvantage ratio is greater than one in that industry. However, the relatively high cost disadvantage ratios in petroleum

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refining (ISIC 354) and iron and steel (ISIC 371), as well as overall does not seem to be explained by scale of production, but instead in the case of Singapore may reflect more efficient production processes. The assumption of similar production processes appears not to hold in the case of Singapore.

Clearly, there are inconsistencies due to the lack of firm-size specific data, but it is evident that output per establishment tends to be lower in ASEAN than in the United States, and from this it may be implied that on average, firms in ASEAN are producing at less than the MES. MES is large relative to total output in similar industries in Indonesia, Malaysia, and the Philippines. Further, the extremely low cost disadvantage ratios (with the difference from U.S. value-addedper-worker of much more than 10 and 20 percent) indicate that large minimum efficient scales may constitute a significant barrier to entry in these industries. In these industries, enlarging the size of the market through the lowering of intra-ASEAN trade barriers may be an effective means of achieving economies of scale.

### VI. Assessment of Tariff Preference

The pattern of protection is generally expected to be inverse to the pattern of comparative advantage. Except in the case of protection necessary because of temporary shifts in short run competitiveness or to nurture infant industries, industries which must be protected from foreign competition do not represent a nation's comparative advantage.

A. General Tariff Structure and Pattern of Preferences Offered<sup>17</sup>

There is similarity in the tariff schedules across the ASEAN countries in most cases for total trade. The Spearman rank correlation coefficients for total trade are significant at the 1 percent level in all cases but Indonesia-Singapore, Singapore-Thailand, and the Philippines-Singapore, and are especially high between Malaysia, the Philippines, and Thailand (Table 3.15). The tariff structures of the countries are also correlated at the 1 percent level of significance in manufactures. Singapore's pattern of protection overall varies significantly from those of the other ASEAN countries but it has some similarities with Malaysia. This similarity may be the result of the high degree of protection in alcoholic beverages. In terms of manufactures, Singapore's structure of protection is correlated to those of Malaysia and the Philippines.

Contrary to expectations, there is a strong positive correlation between RCAs and tariffs in all of the ASEAN countries except for Singapore. Table 3.16 shows that Spearman 1. It correlation coefficients are positive and significant at the 1 percent level for all of the countries except for Singapore. This means that tariffs tend to be higher in industries where export specialization occurs. The correlation coefficients are also significant at the 1 percent level and are higher in manufacturing in all of the countries with the exception of Indonesia and Thailand. The tariffs adopted by the ASEAN countries with the exception of Singapore reflect the use of policies aimed at protecting specific industries in the domestic markets which are eventually exported. However, in Malaysis, the Philippines, and

Tab	16	3	15
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Similarity of tariff schedules Total Manufacturing Indonesia-Malaysia .537 -.077 Indonesia-Philippines .782 .023 Indonesia-Singapore -.049 -.954 Indonesia-Thailand .028 .730 Malaysia-Philippines .696 .863 Malaysia-Singapore .689 .342 Malaysia-Thailand .572 .745 Philippines-Singapore .162 .410 Philippines-Thailand .804 .793 Singapore-Thailand -.011 .043

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Similarity of Tariff Schedules<sup>4</sup> of ASEAN Countries

NOTE:

a. Spearman rank correlation coefficients.

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### Table 3.16

	Sin export ar	nilarity of specialization nd tariffs	Similarity of export specialization and margins of preference		
	Total	Manufacturing	Total	Manufacturing	
Indonesia	.565	701	.011	-3.678	
Malaysia	.552	. 560	.908	.919	
Philippines	.896	. 687	.972	. 907	
Singapore	.082	. 669			
Thailand	.472	.171	.852	.981	

Correlation between Export Specialization Indices and Tariffs

NOTE:

a. Spearman rank correlation coefficients.

Thailand, preferences offered to other ASEAN countries are closely correlated with export specialization indices. In other words, these countries are likely to offer higher preferences for items that they themselves export. In Indonesia, the opposite is true for manufactured goods, i.e., preferences are lower for manufactured goods that Indonesia exports.

The above conclusions are supported when looking at the data aggregated into the broad factor content based categories and end use categories. Table 3.17 shows that contrary to the premise that the ASEAN countries are relatively well-endowed with unskilled labor and therefore protection would be low in this area, average tariff levels

### Table 3.17

	Agricultural resource- intensive	Mineral resource- intensive	Unskilled- labor resource- intensive	Human capital resource- intensive	Technology resource- intensive
Average tar:	lffs				
Indonesia	35.14	23.74	59.37	28.96	21.22
Malaysia	39.45	16.60	33.64	18.91	15.24
Philippines	28.96	23.35	40.65	24.16	17.62
Singapore	49.60	0.11	0.56	0.40	4.23
Thailand	45.47	26.17	59.97	33.07	29.41
Margins of	preference				
Indonesia	4.90	6.69	2.66	5.01	5.43
Malaysia	8.55	9.87	8.82	8.25	10.60
Philippines	12.65	11.68	15.50	15.60	15.69
Singapore	0.02	0.00	47.22	49.66	5.06
Thailand	5.39	14.74	7.55	5.38	3.29

## Average Tariff Levels and Margins of Preference by Industry Factor Intensity,<sup>a</sup> 1985

NOTE:

a. See Table 3.8 for classification scheme.

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Source: United Nations, Tariff Information System.

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are highest for these goods in all countries except for Singapore. For Indonesia and Thailand, tariffs for unskilled labor intensive goods average nearly 50 percent and are about 40 percent in the Philippines and 30 percent in Malaysia. In contrast, technology-intensive goods have much lower average rates of protection, again with the exception of Singapore, ranging from 15 percent in Malaysia to 30 percent for Thailand.

The influence of import-substitution policies on the tariff structures of these countries are even clearer when looking at the breakdown by use (see Table 3.18 for breakdown of categories). Capital and intermediate goods, largely supplied by developed countries, tend to face lower tariffs than imports of consumer goods. Table 3.19 shows that average tariff rates on intermediate and capital goods are in the area of 20 to 25 percent in Indonesia, the Philippines, and Thailand. In Malaysia, the average tariff rate on capital goods is only 6.5 percent. In contrast, consumer goods face average tariff rates of more than 40 percent in the Philippines, nearly 50 percent in Thailand, and about 65 percent in Indonesia and Malaysia. Yet, consumer manufactures are major export items of these countries accounting for a significant share of total trade. The higher rates of protection for finished goods and the low rates of protection on intermediate and capital goods means the effective rate of protection for final products is very high.

Margins of preferences offered under the present PTA are similarly uncorrelated with export specialization indices. However, looking at broad product categories, a country generally provided large tariff concessions in goods where it had clear comparative advantage vis-a-vis

# Table 3.18

Economic Categories by End Use

Commodity group	SITC groups				
Intermediate_goods					
Labor-intensive	5 (excl. 515, 54, 55), 61, 621, 63, 641, 662, 663, 664, 693, 694				
Capital-intensive	661, 691, 692, 698,812				
<u>Capital goods</u>					
Labor-intensive	695, 712, 714, 715, 717, 718, 719, 731, 733, 861				
Capital-intensive	711, 722, 723, 726, 729, 732, 734, 735				
Consumer durables					
Labor-intensive	667, 697, 82, 83, 864, 891, 897				
Capital-intensive	724, 725, 862, 863, 896				
Consumer nondurables					
Labor-intensive	642, 65, 665, 666, 696, 84, 85, 892, 893, 894, 899				
Capital-intensive	54, 55, 629, 895				

Source: Havrylyshyn and Civan (1985).

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### Table 3.19

# Average Tariff by Production Process and Factor Intensity,<sup>4</sup> 1985

	Indo- nesia	Malay- sia	Philip- pines	Sing- apore	Thai- land
Average tariff					
Intermediate					
Labor-intensive	25.59	26.16	24.27	12.15	40.81
Capital-intensive	35.39	27.59	33.95	0.0	40.61
Capital goods					
Labor-intensive	25.04	15.09	20.15	0.10	26.18
Capital-intensive	26.73	25.63	21.98	1.34	31.27
Consumer durables					
Labor-intensive	72.03	28.60	41.82	0.51	54.66
Capital-intensive	37.33	25.08	27.38	1.60	41.20
Consumer nondurables					
Labor-intensive	91.19	43.34	43.17	1.15	71.57
Capital-intensive	37.49	41.74	28.20	0.08	44.95
Margins of preference					
Intermediate					
Labor-intensive	6.83	9.70	14.67	3.59	5.99
Capital-intensive	3.40	6.75	16.80	0.00	11.49
Capital goods					
Labor-intensive	5.68	7.77	17.87	66.67	4.04
Capital-intensive	3.52	3.60	16.64	37.46	3.15
Consumer durables					
Labor-intensive	4.57	13.03	16.21	66.38	3.28
Capital-intensive	7.58	10.22	18.24	0.0	3.15
Consumer nondurables					
Labor-intensive	1.45	5.67	11.78	32.60	6.84
Capital-intensive	2.77	4.51	17.88	60.00	4.06
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NOTE:

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a. See Table 3.18 for classification.

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Source: United Nations, Tariff Information System.

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the other ASEAN countries and low preferences where it was likely to face the most competition from the other countries. For example, Indonesia offers the lowest tariff preferences for unskilled labor-intensive goods (less than 3 percent) while offering the highest tariff preferences in mineral commodities (nearly 7 percent). In the Philippines, the lowest preference levels, averaging 12 percent, are found in agricultural and mineral-resource intensive goods where it has a comparative disadvantage vis-a-vis the other ASEAN countries. Similarly, Thailand was willing to provide large tariff preferences for other ASEAN members in mineral-intensive goods (15 percent) and but very low preferences in technology-intensive goods (3 percent). Surprisingly, preference levels in agriculture are relatively low at 5 percent despite Thailand's strong comparative advantage in this sector. Malaysia provided a more even distribution of tariff preferences which did not favor any particular sector.

Similar results were found when examining the pattern of tariff preferences when looking at manufactures by part in the production process. For Indonesia, the Philippines, and Malaysia, consumer goods (where Thailand and Singapore have high export specialization indices), are accorded the lowest levels of preference. In Thailand, the lowest levels of preference are offered for capital goods and consumer durables. This pattern of preferences, with higher preferences being offered for labor-intensive goods, reflects Thailand's confidence in the competitiveness of its products in these industries in the region.

B. Tariffs, Non-tariff barriers, and Preferences on Specific Items of Interest

The above shows that average tariffs tend to be highest and margins of preferences lowest in areas where competition by other countries in the region is greatest, suggesting that the structure of protection does discriminate against other member countries. It is interesting to look at this more closely, selecting items where the export specialization indices of one or more of the ASEAN countries was very high (Table 3.23 in Appendix C).

1. Agriculture and food products

Tariffs on non-food commodities are relatively low but in food products, as mentioned previously, tariff levels tend to be high and preference margins low. Surprisingly, the tariff rates for food items tend to be the highest in Thailand, the major exporter of many of the items. Tariffs on fish (fresh and preserved in various ways) range from between 60 percent to 246 percent with zero preferences despite the fact that Thailand is the major exporter of the region. This suggests that lowering tariffs on these items would do little to increase Thai imports from other ASEAN countries. There are however some areas where imports can expected to increase, including fruits and nuts (SITC 057), sugar confectionary (SITC 062), coffee and substitutes (SITC 071), cocoa (SITC 072), tea (SITC 074), margarine and shortening (SITC 091), and oil seeds (SITC 223). Tariff levels tend to be high and preferences low or non-existent in these items that other ASEAN countries besides Thailand specialize in exporting.

Tariffs on food items are also high in the Philippines which also is a significant exporter of many food items. Nonetheless, larger preferential tariff rates on rice, maize, eggs, and vegetables (fresh and prepared) may serve to increase imports from Thailand.

In the other ASEAN countries, tariffs do not appear to be a significant barrier to trade in most food products, with the exception of alcoholic and non-alcoholic beverages where tariffs are exceedingly high. Singapore has virtually no tariffs on food items with the exception of a 19 percent tariff on sugar for which a 13 percent preference is given to imports from other ASEAN countries. In Malaysia, tariffs on only a few items may be significant. These include fruits and nuts (SITC 057), preserved fruit (SITC 058), and sugar confectionery (SITC 062). Margins of preference now offered for these items are still relatively low. Tariffs may be a more important factor in restricting imports from other ASEAN countries in Indonesia. Tariffs on prepared fish (SITC 037), cereal preparations (SITC 048), fruit (SITC 057 and 058), sugar confectionery (SITC 062), and edible products (SITC 098) are very high with low preference margins offered.

It should be noted that non-tariff barriers also restrict imports of food products. For example, both Indonesia and Malaysia have virtually no tariffs on rice but they restrict rice imports through licensing. Sugar is also subject to import licensing in both countries. Additionally, most fruit and nuts, prepared and preserved fish, crustaceans and mollusks, sugar confectionary, and many edible products require import licenses in Indonesia. Licenses are also required in Thailand for oil seeds and coffee. Additionally, imports of some oil

seeds are prohibited. In the Philippines, most food products are subject to licensing or health and sanitation restrictions or both. The above suggests that increasing preference margins on food items would not significantly increase intra-ASEAN trade except in a few cases. Non-tariff barriers are present in the majority of cases where increasing preference margins might have served to increase trade.

2. Non-food commodities

Tariffs on non-food commodities tend to be low with a few exceptions such as tobacco. Additionally, in Thailand the highest tariffs (41 percent) are found in jute (SITC 264) where it is the only important exporter in the region and other vegetable textile fibers (264), an important export of the Philippines.

Non-tariff barriers are not significant for most non-food commodities important to ASEAN countries. The major exception is petroleum and coal (including products) where licensing is generally required.

3. Manufactures

Biases against exports of other ASEAN countries are clearer in manufactures. Tariffs are high on many of the important export items of the region. For example, tariffs are generally higher than 50 percent for textiles and clothing in all countries except for Singapore, despite the fact that all countries are exporters. Similarly, tariffs are relatively high in wood and rubber manufactures, leather, glassware, pottery, consumer electronics, footwear, travel goods and handbags articles of plastic, jewelry, cutlery, and other household metal products, and other manufactured articles. Tariffs tend to be lower in

chemicals with the exception of perfumery and cosmetics (SITC 551), where Indonesia is a strong exporter.

Non-tariff barriers, on the other hand, are not as prevalent. Exceptions include leather and wood products in most countries. Additionally most chemicals, rubber products, and most types of electrical and nonelectrical machinery are subject to licensing in the Philippines. In Indonesia, several textile items and rubber tires require import licenses.

It is clearly in the area of manufactures that the potential for intra-ASEAN trade expansion lies. Reduction in tariff rates th\_ough the PTA can significantly increase imports in many products. Significantly, non-tariff barriers are not prevalent in most of these products.

#### VII. Possibilities for Future Trade Expansion

This chapter has shown that despite basic similarities in the structure of comparative advantage in the region with the exception of Singapore, significant complementarities also exist. Further, present trade barriers are biased against further expansion of intra-regional trade. And the situation is not improved by the preferential tariff rates offered.

Thus, the potential for increases in trade with the reduction of intra-regional trade barriers, particularly in manufactures, is high. Future prospects are also good because of possible gains through increasing intra-industry trade with increased development. In addition, gains from economies of scale are likely in several industries. The next section will attempt to empirically estimate the

effect of an enhanced PTA on ASEAN trade and production with emphasis on industries were trade is most likely to expand.

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#### NOTES

- 1. Linder hypothesized that trade flows in manufactures will move toward proximate and similar markets and that the greater the similarity between the patterns of domestic demand, the higher the trade between two countries should be (see Appendix B).
- 2. See Table 3.20 in Appendix C. Excluding Singapore, intra-ASEAN trade among the other ASEAN countries is about 5 percent of total trade.
- 3. The low collection rate may also be due to the failure of customs officials to remit collections to the government. The recent employment of a Swiss company to collect tariffs in Indonesia and the increase in collection amounts thereafter supports the above.
- 4. For example, the definition of factor intensity in Deardorff's model is an autarky price which is in actuality unobservable. Any proxies used are usually not comparable across countries. Regarding model specification, Baldwin (1971) points out that one cannot look at only a single factor such as capital per worker, but other factors such as human capital, natural resources, and technology are also important. Further, levels of protection, transportation costs, and other external influences also affect the pattern of trade.
- 5. See for example Deardorff 1982, Balassa 1981.
- 6. See for example Bowen 1983.
- 7. The resource abundance profile is calculated according to the function (5x-5)/(x+5), where x is the resource share divided by the GNP share. This function takes on the value of -1 if x=0 and 0 if x=1 (Leamer 1984).
- 8. In the case of tertiary education in particular, the numbers should be viewed with caution because of quality differences, the inclusion of technical schools, and the exclusive of students studying abroad. Furthermore, because the denominator includes total population between the ages of 20 to 24, the numerator will often include those outside of the age group attending a tertiary institution.
- 9. See Appendix A for further discussion on the use of this index.
- 10. Bowen (1983) notes that since a nation does not export every commodity, unity should not be used as the critical value above which comparative advantage is indicated. In this paper, however, unity or numbers close to unity was used as an indicator of some comparative advantage.
- 11. See Appendix B for further discussion.

- 12. Other measures have been used. Most particularly, Aquino (1978) who seeks to address the downward bias of the Grubel-Lloyd index due to trade imbalances. Tharakan (1986) however, found that the rankings of both indices are very similar.
- 13. The one major difference is trade in clothing between Singapore and Malaysia. Here reporting discrepancies by the countries are apparent. Although Singapore reports intra-industry trade occurring in clothing with Malaysia, this is not reported by Malaysia. This may be largely due to the entrepôt role of Singapore.
- 14. Trade advantage was defined by Owen to be:

TA = (Xab-Xba)/(Xab+Xba)

Plant size was measured as: (1) ratios of average sizes of largest 20 plants; (2) ratios of average size of largest plants accounting for 60 percent of each industry's labor force.

- 15. Caves et al. also point out a third important factor, the price elasticity of demand.
- 16. Caves et al. used the following assumptions for their conclusion that the reported variations of value-added per worker with scale of establishment will provide an inverse measure of variations in average unit cost: (Caves et al. 1975): (1) All firms are producing the same products or have similar production functions; (2) The optimal K/L ratio must not vary too much with scale. If K/L increases with scale, the elasticity of value-added with respect to size measured by employment will overstate the elasticity of average unit cost with respect to output; (3) Labor quality and wage rates should not vary with scale, nor should relative amounts of purchased services such as advertising; (4) If large amounts of monopoly rents are being made, it may inflate the value-added per worker for these plants; (5) There must be something which preserves the survival of sub-MES units.
- 17. See Chapter V for description of data used.

#### CHAPTER IV

#### SURVEY OF LITERATURE: EMPIRICAL MEASURES OF THE EFFECTS OF INTEGRATION

### I. Introduction

Most studies attempt to estimate the effects of integration by quantifying a hypothetical situation (antimonde) of what would have happened with or without the trading agreement. These studies can be ex-ante or ex-post models. In the ex-ante models, authors first forecast the imports in the post-integration period on the assumption of no integration and with integration. These models are subject to all of the usual forecasting errors, plus uncertainty about changes in world economic conditions. The major problem of ex-post models is to estimate what imports would have been in the assumed absence of economic integration. Since ASEAN has established its PTA in 1976, it is possible to look first at the effect of the tariff reductions since that time to the present. However, because of the improvements to be made, in particular deepening the margins of preferences, it is also important to estimate what the likely effects will be. Therefore, various ex-post and ex-ante measures are presented here.

#### II. Ex-post Models

Ex-post analyses are used when a group has been in existence for some time, comparing the actual situation with a hypothetical alternative of no integration (the antimonde) to estimate the effect of integration. The argument most often presented is that imports (or import shares) would have increased at the same rate as they did before

the agreement. Because of the problems of trend extrapolation for such a cyclical activity like trade, others have assumed that imports will retain the same linear relation to total expenditure for GDP in the antimonde. The use of residual imputation is widely resorted to because of the absence of reliable estimates of price elasticities required in an approach which tries to estimate the effects of integration directly by relying on a specified model.

A. Import Shares or Import Growth Approaches

In practice, the most commonly used quantitative indicator of the extent and progress of integration or economic interdependence is the relative shares of trade with partners and nonpartners and on changes in those shares over time. The implicit assumption is that in the absence of integration the shares would have remained constant.

Import growth approaches look instead at import growth as compared to an antimonde or a hypothetical import growth rate with the absence of integration. The antimonde frequently used (EFTA 1972) is that import growth would have continued following the trend of the preintegration period. Another method is to normalize the antimonde using the experiences of a third country or group of countries outside the integration area (Kreinen 1972).

Both the trade ratios and import growth approaches provide broad indicators of the actual level of economic interdependence among the member countries of a grouping. They are also convenient to calculate since only trade data are needed. But the results in both approaches will be biased because they do not reveal the extent to which trade flows have been affected by the integration arrangements rather that

other external situations. In the 1970s, there were substantial fluctuations and changes in levels, direction, and structure of world trade. These changes make extrapolation of pre-integration trends in the post-integration period unreasonable. Additionally, as will be seen in the case of ASEAN, import shares and growth rates fluctuate widely over the years. In particular, the effects of the oil shock after 1973 have had a significant impact on intra-regional trade.

The approach used by Kreinin (1972) and Plummer (1988) with a control country to normalize the antimonde gets around some of these problems. By comparing trade patterns of a non-member country with parter countries, the methodology assumes that the major difference between the two is integration. Obviously, if the non-member is very similar to the member country, it will be a better predictor. Since a country that is similar to the countries in the group faces similar exogenous changes in the international environment, then the effect of these changes will be netted out and the integration effect will remain.

To do this, the antimonde  $(M*_{12})$  is derived by adjusting imports of country i in the time period 1 by the import growth rate of the control country  $(M_n)$ . The antimonde is then subtracted from actual imports in period 2 to estimate trade creation (TC).<sup>1</sup>

 $TC = [M_{12} - M \star_{12}]$ 

where:  $M*_{t_2} = [M_{t_1} (1 + m_n)]; M_{t_1} = \text{imports of country i in time period t}, t=1, 2; and m_n = growth rate of imports in control country n from t_1 to t_2.$ 

Trade creation is calculated for all commodities and summed over all commodities in country i to derive total trade created for that
country. The sum of trade created over all member countries yields total trade creation stemming from integration.

Trade diversion (TD) is estimated in country (for each commodity group) by subtracting the actual external imports in period 2 ( $M_{H2}$ ) from antimonde external imports ( $M*_{H2}$ ):

$$TD = [M_{H_2} - M_{H_2}]$$
(5.5)

where:  $M*_{ik2} = [M^{x}_{ik2}(1 + m_{nk})]; M*_{ikt} = imports of country i from$  $non-members (k) in time period t, t = 1, 2; and <math>m_{nk}$  = growth rate of external imports in n from t<sub>1</sub> to t<sub>2</sub>.

This value is summed over all commodities in country i to compute total trade diversion for that country, and summing over all i yields total trade diversion for the integration group.

No ideal control country or group of countries will exist, but several adjustments to the antimonde can be made to improve the situation. First, commodities can be excluded if the trade position of the member country and the control country for the commodity are unacceptably different. Second, differentials in income growth rates between the member and control countries must be taken into consideration. Rapid income growth will correspond with rapid import growth. Therefore, if the income growth rate of the control country is faster than that of the member country, the import growth rat- used in the antimonde will be too high. Trade creation would be understated and trade diversion overstated. Finally, other factors such as inflation and exchange rate changes will affect the import growth of a country and bias the results. For example, high rates of inflation would lead to a relative decline of a country's competitiveness and promote imports.

Changes in the exchange rate will likewise affect import growth. Other factors, such as differentials in productivity growth and wage changes, may also affect the relative competitiveness and therefore imports of a country, but by taking into consideration differentials in income growth, inflation, and exchange rate changes, the most important factors are accounted for and it can be assumed that most other factors will be subsumed within the above three.

B. Shares of Apparent Consumption

Truman (1969, 1972, and 1975) used shares of apparent consumption rather than shares of imports, allowing for a distinction between trade creation and trade diversion.<sup>2</sup> Expenditure on apparent consumption (C) is defined as the gross production less exports plus imports from partners and non-partners (including tariff revenues on imports from partners and non-members. The domestic share (DS) is computed as the ratio of gross production less exports over C, and the shares of the various members and non-members are computed as the ratio of the relevant imports plus tariff revenues to C. The assumption is that if the share of total imports in apparent consumption of members of the union increases, there is internal trade creation; if the share of imports from non partner countries falls (rises), there is trade diversion (creation), and if the share of domestic production rises, there is trade erosion.

Although this approach is able to separate trade diversion and trade creation, it has many of the same problems as a simple trade ratio. The assumption of no change from the pattern of the pre-integration period is unrealistic, because it is likely that in the

absence of integration, a country's domestic shares of expenditure on apparent consumption would have declined, while the partners' and non-members' shares would have increased. Williamson and Bottrill (1971) point out that the marginal propensity to import generally rises with income. In other words, import elasticities are generally thought to be greater than one, thus contributing to a decline in the domestic share with general economic growth. Additionally, intra-industry specialization and other factors may have contributed to a pro-trade biased growth.

Truman, in his 1975 study, attempted to adjust for cyclical fluctuations to overcome the arguments above. Regardless, as with simple trade ratios, other policy changes or price changes affect the ratios. For example, the overall reduction in trade barriers due to the Dillon and Kennedy rounds make conclusions about integration effects on the EEC uncertain. Indeed, the results of Truman's 1975 study were mixed, leading him to concude that other complex factors have profoundly affected the patterns.

As in the first approach this problem can be addressed by using a control country or group of countries to contruct the antimonde. Thus, trade creation is measured as follows:

$$TC = [(M_{12}/C_{12}) - [(M_n/C_i)*]C_{12}]$$

where:  $M_{t}$  = imports of country i in period t, t = 1,2;  $C_{t}$  = apparent consumption in period t, t = 1, 2;  $(M_n/C_i)* = (M_{i1}/C_{i1})[1 + (m_n/c_n)]$ ; where  $m_n/c_n$  = rate of growth in imports to apparent consumption from period 1 to period 2 in control country n. The ratios of imports to apparent consumption are multiplied by total apparent consumption in period 2, the post-integration year, to get trade created. This can be done for each commodity and summed across commodities to get total trade created.

Trade diversion is estimated analoguously to the normalized import growth approach. The growth rate in the control country's external imports share in apparent consumption is used in the trade diversion equation to estimate what that ratio would have been in the absence of integration. The percentage change in actual values of import shares in apparent consumption are subtracted from the percentage change in antimonde external import shares in apparent consumption to calculate trade diversion.

C. Regression Models

Verdoorn and Schwartz (1972) and Aitken (1973) used the least squares regression method to look at the effect of EFTA and the EEC following a variant of Linnemann's (1966) gravitational model which incorporates distance as a variable. The multiple regression models holds other major variables constant, thus enabling isolation of the effect of integration on trade from the effect of income growth and changes in other variables.

Aitken used nominal GNP and population size of the importing and exporting countries, distance between the commercial centers, and dummy variables for adjacent countries and for membership in EEC or EFTA as the independent variables.<sup>3</sup> The GNP and population variables are indicators for potential export supply and import demand while the distance variable is a proxy for natural trade resistence, e.g., transport cost. The dummy variable for adjacent countries is an indicator for similar tastes, etc.

To look at what would have happened without integration, the equation was estimated leaving out the trade preference variables, using an intertemporal comparison with the last year when there was no trade-preference effect (1958) as a base year. The estimated values were then subtracted from the actual values to obtain the residual estimates of trade effects of the EEC and EFTA. A further important feature of this model is that it is estimated annually for the period 1951-67, allowing comparison of the values in individual years from the intra-trade dummies.

In the case of the EEC, the coefficient of the integration dummy became statistically significant (5 percent) after 1961. In addition, GNP, population, distance, and the neighbor-country variables were highly significant in all years. Aitken found the total effect to be \$9.2 billion for the EEC and \$1.3 billion for EFTA for 1967 with substantial trade creation and some trade diversion.

Verdoorn and Schwartz (1972) used growth rates of GNP in the importing countries as a proxy for import demand and growth of manufacturing production in the export country as a proxy for export supply. They also included changes in relative prices (including the effects of tariff charges and tariff reductions) in the union to find the promotional effect of integration. They estimated trade creation in 1969 to be \$10.1 billion and trade diversion to be \$1.1 billion for the EEC and EFTA combined.

A major problem with this kind of analysis, as pointed out by Mayes (1978) is that cross-section data cannot represent a relationship which responds to cycles in economic activity. Furthermore, no attempt at

disaggregation is made because of prohibitive data requirements. Moreover, the estimates will tend to overstate trade creation and understate trade diversion since no account is taken of increasing intra-regional trade in the absence of integration. This problem, however, can be addressed by estimating parameters of the equation using time-series data prior to accession and assuming that total imports will follow the same trend in the post-integration phase as in the pre-integration phase.

D. Model Selection

The import growth and the shares in apparent consumption approach have been selected for use in this study. Both allow an analysis of the efficiency changes stemming from integration and do not have prohibitive data requirements. The results are normalized using Korea as the control country after adjusting for income growth and considering manufactures only.

The regression approach was not selected because the nature of ASEAN PTA made this approach unsuitable. There was no particular date that integration took place. As discussed in Chapter I, the tariff preferences were offered in small increments over a period of time with large number of items excluded from preferences. The preferences were offered on an ad hoc basis with each country giving preferences on selected commodities. This makes it impossible to find suitable price variables and is not amenable to the integration dummy approach used by Aitken.

#### III. Ex-ante Models

The purpose of the ex-ante estimation is to forecast changes resulting from integration before it occurs. It is necessary therefore to forecast both total future imports from both partners and nonpartners, with and without integration.

A. Standard Price-Elasticity Approaches

The standard partial equilibrium model assuming infinitely elastic supply is commonly used. The welfare effect is estimated by first measuring the change in import demand. Estimates of import demand elasticities are used to arrive at the effects of the tariff and price changes on the domestic demand for imports. Since elasticities of demand for imports are often not available, they are estimated using the fact that given the elasticity of domestic demand for a commodity, the elasticity of demand for imports varies directly with the ratio of domestic consumption to imports, the elasticity of domestic supply, and the ratio of domestic production to imports (Hawkins 1968).<sup>4</sup> This method assumes that perfect substitution between imports and domestically produced goods exists, and therefore only the elasticity of import demand in the country of origin and the export demand in other members must be considered.<sup>5</sup> Assuming that import prices decrease by the full amount of the tariff (i.e., elasticity of supply is infinite):

 $dM_{ij} = M_{ij} (\Delta t / (1 + t_i)) \epsilon_i;$ 

where:  $M_{\mu}$  = imports of country i from country j;

t<sub>i</sub> = tariff rate in country i;

 $\epsilon_i$  = elasticity of demand for imports in country i.

The volume of trade created or diverted is then multiplied by half of the change in the tariff to estimate the two triangles that represent trade creation and trade diversion as discussed in Chapter II. Trade creation can then be estimated to be:

 $TC = .5 (\Delta t dQ_i) - .5 (\Delta t_i dC_0 - .5 (\Delta t dM_i))$ 

where: dQ<sub>4</sub> - decline in output of import competing goods in country i,

dC<sub>1</sub> - increase in consumption of import goods in country i.

The calculations are made for all partners in all industries to determine the amount of trade created.

In order to estimate trade diversion, it is necessary to first estimate the import price elasticity of substitution between partner and nonpartner imports ( $\sigma$ ). The larger the elasticity of substitution, the greater is the degree of trade diversion:

 $\Delta M_{ik} = \sigma_{ik} (\Delta t) M_{ik}$ 

where:  $M_{ik}$  = imports of country i from non-member country k;

$$\sigma_{jk}$$
 - elasticity of substitution between partner and nonpartner imports.

The change in non-partner imports is then multiplied by the change in the tariff to get trade diversion. The trade diversion effect is then subtracted from trade creation to get the net effect of integration. This is justified under the assumption of linear supply and demand functions and constant costs.

All three previous ex-ante studies of ASEAN integration employed the above approach. Naya (1980) was the first to use this methodology in relation to all ASEAN countries. He found that if all the ASEAN countries would reduce tariffs preferentially by 10 percent across-the-board, intra-ASEAN imports and exports would increase by \$32 million (or \$49 million if weighted averages were used). Ooi (1981) did a similar study and found that the trade creation effect would be negligible. Trade diversion would also be small though in many cases larger than trade creation. Devan (1987) used the same methodology and found that a reduction of 25 and/or 50 percent in the margins of preferences would result in a 4.8 percent or a \$110.57 million increase in trade for the four resource-rich ASEAN countries. Trade diversion would be about one half the size, valued at \$58.67 million.

These projections of trade flows, depending only on import demand in the previous periods, make many strong assumptions. They assume that past trends will continue in the future without recognizing the effects of other events such as multilateral tariff reductions or the effect of the integration effort itself on GNP or consumption. In other words, they require that the formation of the union be the only major structural change which affected extra-area trade flows. Furthermore, they are highly sensitive to the choice of base years and elasticity values chosen.

Additionally, supply factors are also not considered. Clague (1971) showed that a substantially different result would be obtained if export supply elastiticities were less than infinity. Janssen (1961) also argued that in a model were supply factors are not considered, the changes estimated to result from integration are likely to be small.

#### B. Armington Approach<sup>6</sup>

Armington (1969 and 1970) begins with the fundamental assumption that products from different countries are imperfect substitutes and thus measures demand for products distinguished by place of production.<sup>7</sup> In value terms:

$$P_{ij} X_{ij} = b_{ij}\sigma_i P_i X_i (P_{ij}/P_i)^{-\sigma_i};$$

where:  $X_{ii}$  - demand for good i from country j;

- b<sub>ii</sub> a constant;
- $\sigma_1$  the elasticity of substitution in the ith market;
- $X_i$  demand for good i;
- $P_{ij}$  price of  $X_{ij}$ ;
- $P_i$  price of X<sub>i</sub>, and is a function of goods in ith market.

The total differentiation of the above yields the percentage change in demand for  $X_{\parallel}$  in value terms, and the changes in the income and price variables:

$$\frac{d(P_{ij}X_{ij})}{P_{ij}X_{ij}} = \eta_{i} \frac{dD}{D} - [(1-S_{ij})(\sigma_{i}-1) + S_{ij}(\epsilon_{i}-1)] \frac{dP_{ij}}{P_{ij}} + \frac{\Sigma}{k \neq i} [S_{ik}(\sigma_{i}-1) - S_{ik}(\epsilon_{i}-1)] \frac{dP_{ik}}{P_{ik}} + \frac{\Sigma}{k \neq i} \epsilon_{ijk} \frac{dP_{k}}{P_{k}}; \qquad (1)$$

where:  $\eta_i$  - income elasticity of demand for  $X_i$ ;

$$S_{ij} = market shares = \frac{X_{ij}}{X_i};$$

 $\epsilon_i$  - direct price elasticity of demand for good i;

 $\epsilon_{ijk}$  - cross elasticity of demand for X, with respect to k. The growth of demand for X<sub>ij</sub> is thus divided into the following four components: an income effect, an own price effect, the effect of prices of closely related products, and the effect of all other prices. The bracketed coefficient of  $dP_{ij}/P_{ij}$  is the own price elasticity of demand for  $X_{ij}$ , while the bracketed coefficient for  $dP_{ik}/P_{ik}$  represents the cross elasticity of demand for  $X_{ij}$  with respect to the price of product i from other countries k. This equation can be simplified as suggested by Armington (1969) by assuming that the fourth term is small enough to be ignored. Armington suggests that this assumption would not be unreasonable if changes in price levels in other markets are small, or if such changes may have offsetting effects on demand.

The major problems of this model are similar to those of the simple partial equilibrium model, although the assumption of product differentiation by place of origin allows for shifts in location dependent on the elasticity of substition. A variant of this model, including the effect of growth in GNP and production will be developed below.

C. Tyers' Approach

Tyers (Uehara and Tyers 1980, Lin 1986) starts with the total differentiation of the Armington equation which yields the percentage change in demand for  $X_{ij}$  in value terms, and the changes in the income and price variables.

He assumes that the fourth term is small encugh to be ignored and, recognizing that the parameters of this equation will differ among consuming countries, a country subscript h is inserted.

Equation (1) can then be rewritten in proportional change form:

$$\hat{\mathbf{x}}_{hij} = \eta_{hi}\hat{\mathbf{Y}}_{h} + \sum_{k} e_{hijk} \hat{\mathbf{P}}_{hijk} \begin{pmatrix} e_{hijk} = (1 - s_{hij})\sigma_{hi} + s_{hij} \epsilon_{hi}, j - k \\ e_{hijk} = s_{hik}(\sigma_{hi} - \epsilon_{hi}); j \neq k \end{cases}$$
(2)

1. Introducing price distortions

To take into consideration the effect of government intervention, the consumer price in country h of good i from country j is distorted according to:

$$P_{ij}^{m} - g_{ij}^{m} P_{ij}$$
(3)

where  $g_{hij}^m$  is the ratio of the consumer price in country h of the product i from country j to the corresponding border price. Therefore,  $g_{hij}^m$  is the nominal protection coefficient in country h with respect to goods produced in j.

Distortions can also affect the export price. The deviation in the border price  $(P_{\mu})$  from the producer price in country j  $(P_{\mu})$  is shown by:

$$\mathbf{P}_{\mathsf{N}\mathsf{i}} = \mathbf{g}_{\mathsf{N}\mathsf{i}}^{\mathsf{s}} \mathbf{P}_{\mathsf{i}}; \tag{4}$$

where  $g_{hij}^{\bullet}$  is the ratio of the border price in country h to the producer price in j.

Both ratios are assumed to be exogenous, summarizing the effects on prices of the tariff, subsidy and exchange rate policies of each consuming country h. Differences in international and domestic transportation and insurance costs are also implicit in these parameters.

Expressed in proportional change form, they become:

$$\hat{\mathbf{P}}_{\mathsf{h}\sharp}^{\mathsf{m}} = \hat{\mathbf{P}}_{\mathsf{h}\sharp} + \hat{\mathbf{g}}_{\mathsf{h}\sharp}^{\mathsf{m}} \tag{5}$$

$$\hat{\mathbf{P}}_{\rm hil} = \hat{\mathbf{P}}_{\rm H} + \hat{\mathbf{g}}_{\rm hil}^{\rm o} \tag{6}$$

2. Supply effects

It is assumed that each country produces a homogenous good for both domestic consumption and exports, though the good is not homogeneous across countries. Production is a function of producers' prices. The supply function takes the following form:

 $q_{ij} = a_{ij}P_{ij}^{7i}$ where:  $a_{ij}$  is some constant;

 $\gamma_{ij}$  is the elasticity of supply of good i in j; and

 $P_{ij}$  is the producer price of good i in j.

In proportional change form, this becomes:

 $\hat{\mathbf{q}}_{ij} = \gamma_{ij} \hat{\mathbf{P}}_{ij} \tag{8}$ 

The system is closed by assuming that the proportional change of the demand for the product of j must be equal to the proportional change in j's production. The shares are drawn from the trade matrix and are assumed to be constant.

In proportional change form, this can be expressed:

$$\Sigma_{h} \mathbf{s}_{hj}^{*} \mathbf{X}_{hj} - \hat{\mathbf{q}}_{ij} - \mathbf{0}; \tag{9}$$

In the model, all 6 countries are simultaneously producers,

importers, and exporters of each commodity. For each commodity, there are 36 unknowns of  $X_{hij}$ ,  $P_{hij}^m$ , and  $P_{hij}$ , and 6 unknown producer prices,  $P_{ij}$ . The solution is found using 36 equations of (2), (5), and (6), and 6 equations of (9).

All the equations are linear in proportional changes, permitting solution by simple matrix inversion.

This becomes:

$$-k_{\text{hij}} = \left(\frac{e_{\text{ij}}}{\sigma_{\text{ij}}} \quad S_{\text{hij}}^{\bullet} - 1\right) \quad \hat{X}_{\text{hij}} + \frac{e_{\text{ij}}}{\sigma_{\text{l}}} \quad \sum_{\ell \neq i} \quad s_{\ell ij}^{\bullet} \hat{X}_{\ell ij}$$
$$+ \frac{\sum_{k \neq j} \quad \frac{e_{\text{hijk}}}{\sigma_{k}} \quad \sum_{\ell} \quad S_{\ell ik}^{\bullet} \quad \hat{X}_{\ell ik};$$

where k<sub>hi</sub> introduces exogenous disturbances;

 $\mathbf{k}_{\text{bil}} = \eta_{\text{bil}} \hat{\mathbf{Y}}_{\text{i}} + \frac{\Sigma}{k} \mathbf{e}_{\text{bilk}} \left( \mathbf{g}_{\text{bilk}}^{\bullet} + \mathbf{g}_{\text{bilk}}^{\text{m}} \right).$ 

The equation can be rewritten in matrix form:

AX = K, and solved  $X = A^{-1}K$ .

D. General Equilibrium Approach

General equilibrium models include production effects and constraints and allow for feedback effects. It is argued that a general equilibrium model is more appropriate to measure the effect of economic integration since when dealing with a situation where tariffs on many products have undergone large changes, partial equilibrium analysis may lead to misleading results (Prewo 1974). A general equilibrium approach allows the determination of direct as well as indirect effects due to intercountry and intercommodity substitution.

Prewo (1974) developed a share approach using an input-output framework. Trade between the Common Market members is assumed to be proportional to demand in the importing and supply in the exporting country and inversely proportional to trade impediments. Extra-area imports are assumed to be related to demand in the EEC. In the model, changes in final demand affect imports directly through their effects on the imports of final goods as well as indirectly through their impact on the imports of inputs for domestic production. Differences between actual and hypothetical results were calculated to determine the effects of integration. Prewo found trade creation in manufactures, with some trade diversion in light manufactures, but generally external trade creation.

More recently, the computational general equilibrium models (CGE) pioneered by Shoven and Whalley (1984) and the Michigan Model of World Trade and Development (MM), developed by Deardorff and Stern (1985 and 1986) at the University of Michigan have been used to examine the effects of integration or trade liberalization. Both models use input-output tables to characterize production and set up a system of equations that describes market demand and supply for a number of inputs and outputs, all of which depend on relative prices in the system. The models simulate behavior in the market as policies change. For example, Whalley (1985) found that a reduction of tariffs will increase consumption of imports and will change the relative price of imports and other goods in the economy. This in turn will affect production. The exporting country will experience higher prices and larger trade volumes and will increase its imports. The ability to capture interactions and feedbacks is a major benefit of these models.

The major reason these models were not chosen for this study is demanding data requirements. The problems with ASEAN trade data are discussed in Chapter V. Production and good input-output data are also difficult to obtain and often flawed. Problems of tariff averaging and conversion from one nomenclature to another are destined to be less than perfect. These are problems in static as well as general equilibrium models but the increased data requirements and the interdependence of all variables in general equilibrium models exacerbates the problem. Leamer (1986) emphasizes this point and suggests that it may be preferable to use a model that does not strictly follow the literal interpretations of a general equilibrium framework mainly to get around

the (sometimes prohibitively) demanding data requirements. In addition, the models do not add any new insight into the dynamic effects of integration and is less amenable to disaggregation than a partial equilibrium approach.

E. Model Selection

The revised version of the Armington approach developed by Tyers was selected for this study because of its ability to isolate income growth effects and to account for supply side effects without prohibitive data requirements. In the case of ASEAN integration, this approach is advantageous because it goes beyond the estimation of trade creation and trade diversion and provides estimates of growth of exports, imports, and production as well as the change in the balance of trade in the region. Importantly, the analysis can be done on a disaggregated industrial level which allows some analysis of changes in the structure of production in the region.

## IV. Conclusion

All attempts to isolate the effects of integration are affected by the specific assumptions employed, by the choice of period, by the methodologies used to compute elasticities or relative shares, and by the allowance made for changes not attributable to integration. Further, the difficulty of incorporating other important effects, such as economies of scale, may lead to a underestimate of the integration effects. All of the above approaches face similar problems. It is recognized that regardless of the approach used, the results must be analyzed with these factors in mind. The approaches selected for this

study provide the most flexibility for this task and are most appropriate to ASEAN.

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### NOTES

- 1. It should be noted that the term trade creation is used in a slightly different manner than in the welfare sense in Chapter II. Trade creation and trade diversion are the total increase or decrease of imports by source rather than the triangles and rectangle in the welfare analysis. Trade creation can be broken up into total trade created and internal trade creation (with members).
- 2. Truman defined the partner's share to be:

 $\frac{M^{P} + t^{P}}{C};$ where  $M^{P}$  - imports from partners,  $t^{P}$  - tariff paid on these imports, and C - total expenditure on apparent consumption.

Tariffs were not calculated for this exercise.

3. The model used by Aitken:

Where:

	X <sub>ij</sub>	- \$ value of country 1's exports to country j measured by 1's import data:
Y	, Y <sub>i</sub>	- nominal GNP of countries i, j;
	N <sub>i</sub> N <sub>i</sub>	- populations of the respective countries;
	D	- distance between the commercial centers of i and j;
	A	- dummy variable for adjacent of neighboring countries;
$P_{ij}^{EEC}$ , $F$	D EFTA ∙ij	- dummy variables for trade between partners.

4. e = Ed (C/M) + Es (Q/M);

where Ed = elasticity of demand C/M = domestic consumption to imports Es = elasticity of domestic supply Q/M = production to imports.

5. Note that this rules out intra-industry trade.

6. See Appendix D for more details on the Armington approach.

7. Two other major assumptions used by Armington (1969) are: (1) marginal rates of substitution between any two products of the same kind must be independent of the quantities of the products of all other kinds, (2) demand function for X<sub>4</sub> is linear are homogeneous. This means that market shares depend only on relative prices of the products in the market; and not on the size of the market itself.

#### CHAPTER V

#### AN EMPIRICAL EVALUATION OF INTRA-ASEAN TRADE

I. Introduction

Despite the rise in shares of intra-ASEAN trade after the mid-1970s, it is generally agreed that the ASEAN PTA has had little effect on intra-ASEAN trade. As discussed earlier, the increasing shares appear to have more to do with the sharp rise in the price of oil than the small decreases in preferential tariffs rates in the PTA.

The opinion that the ASEAN PTA has not been effective is verified by studies which find that preferential trade accounts for only a small share of total intra-regional trade. Oci (1986) finds this figure to be less than 5 percent. Devan (1987) finds that it accounted for 3 and 4 percent of Indonesian imports from ASEAN in 1983 and 1984, and only Malaysia and Singapore are recipients. For Thailand, even less trade is covered by the PTA; preferential trade accounts for about 1 percent of Thailand's imports from ASEAN. Singapore accounts for \$8 million of the total \$11 million.

In another study looking at the effect of PTA, Tan (1982) finds that preferences are often given for commodities that are not traded in the region at all. For example, Thailand offers preferences for wood products that it does not import at all. Chapter III also shows that MOPs are not generally not given in industries where other countries have comparative advantage.

Despite these results, no empirical studies have been undertaken to quantify the effect of the PTA and to actually measure the extent of

trade creation or diversion that has occurred (ex-post). The first section of this chapter examines the ex-post effect of the ASEAN PTA using two empirical methodologies discussed in Chapter IV.

Even more importantly for ASEAN is the probable effect of closer integration. As mentioned in Chapter IV, all of the past studies that try to quantify the ex-ante effects of increased PTAs use the price elasticity approach which neglects to account for supply-side effects. The analyses are also done on an aggregate level and do not examine possible effects on an industrial level. The second section of this chapter looks at how increased tariff preferences can be expected to affect the trade flows, production, and welfare in ASEAN.

### II. Ex-post Analysis

Two methodologies--the import growth and shares of apparent consumption approach--are used to estimate the effect of the ASEAN PTA in terms of trade creation and trade diversion. Growth is calculated from the two year average 1974-5 base to 1983-4. Import and production data are from the "Consolidated Industrial Statistics Data" of the Global Branch Database of the United Nations Industrial and Development Organisation (UNIDO) and from the United Nations, <u>Industrial Statistics</u> <u>Yearbook</u>, 1985. Trade shares are taken from the United Nations, <u>Commodity Trade Statistics</u>, Series D. Import elasticities are estimated as described in Section III of this chapter. Price elasticity estimates for Korea are also derived in a similar fashion.

#### A. Import Growth Approach

For the import growth approach, the analysis depends on the change in growth of trade between partners. As in all ex-post studies, an antimonde is created to estimate what intra-ASEAN trade would have been without the PTA. For this purpose, Korea is selected to be the control country because it is also a relatively open country with moderate to high tariff rates and with rapidly increasing exports in the 1970s and early 1980s. It lacks petroleum, and therefore the petroleum-related sectors (ISIC 353 and 354) are excluded from the study because of the differences between the control country, Korea, and the two oil exporters in ASEAN. In addition, the wood products industry (ISIC 331) is excluded because Korea is a large importer of wood products from ASEAN. ASEAN countries, on the other hand, are all exporters of wood products, and therefore they do not import these products from other ASEAN countries, making trade erosion large in these products.

Several adjustments are made to the antimonde. Korea grew faster (in terms of real GDP growth) than all of the ASEAN countries with the exception of Singapore (Table 5.1). Therefore imports in Korea are expected to grow faster than in the ASEAN countries (except Singapore), and a downward adjustment (upward for Singapore) is made to the antimonde to account for this difference. Additionally, Korea's nominal exchange rate (period average, foreign currency per U.S. dollar) depreciated more relative to the dollar than did those of the other ASEAN countries with the exception of Indonesia and the Philippines. The more rapid depreciation of the Korean won implies that Korea would purchase less imports (since imports became more expensive relative to

# Table 5.1

	Real GDP growth	Domestic price change (GDP deflator)	Change in exchange rate (domestic currency to US\$)
Korea	96.47	272.8	63.4
Indonesia	77.70	287.5	133.2
Malaysia	89.12	74.3	0.0
Philippines	43.25ª	197.8ª	98.1
Singapore	105.72	44.7	-11.7
Thailand	79.26	87.2	14.4

# Differences in Factors Affecting Imports (1974-75 and 1983-84, in percent)

NOTE:

a. GNP.

<u>Source</u>: International Monetary Fund, <u>International Financial</u> <u>Statistics</u>, Yearbook 1988. domestic goods) than most of the ASEAN countries, and therefore the antimonde is adjusted upward except in Indonesia and the Philippines where it was adjusted downward. Finally, inflation (GDP deflator) was much more rapid in Korea than in all the ASEAN countries except for Indonesia implying that domestic goods became more expensive relative to imports, and so imports would tend to be higher in Korea. Therefore, the antimonde is adjusted downward except in Indonesia where it is adjusted upward. These adjustments are made using the following formula (Plummer 1988):

 $[(\mathbf{Y}_n - \mathbf{Y}_i) \ \boldsymbol{\eta}_n^{\mathsf{M}}]\mathbf{M}_i$ 

where:  $Y_i$  - real GDP growth of home country i

 $Y_n$  - real income in the control country n

 $\eta_n^M$  = income elasticity of import demand

Adjustments for inflation rate differentials are made by multiplying the difference in inflation rates in the member and control countries by the price elasticity of demand for imports in the control country. This number is then multiplied by total imports in the base year and substracted from the antimonde: antimonde:

 $[(\mathbf{I}_i - \mathbf{I}_n) \ \boldsymbol{\epsilon}_n^{\mathbf{M}}]\mathbf{M}_i$ 

where:  $I_i = inflation in the home country i$ 

 $I_n$  = inflation in the control country n

 $\epsilon_n^{M}$  = price elasticity of demand in control country n

The exchange rate differential is accounted for in a similar fashion:

 $[(EX_i - EX_h) \epsilon_n^M]M_i$ 

where:  $EX_n$  = change in control country currency/dollars

 $EX_i$  = change in home currency/dollar

The results are presented in Tables 5.2a-e, both with adjustments and without. Unlike the EC, ASEAN has not offered full liberalization of tariffs, and therefore in addition to the calculations of trade creation, the discussion refers to average tariffs and preferences offered in specific commodities. Although calculations are made for Singapore, the discussion excludes Singapore because of its extremely low tariff levels.

All of the countries experience internal trade erosion and net trade diversion. The magnitude of trade erosion is lower with the adjustments for Korea's growth, inflation, and exchange rate differentials, and trade creation occurs in more industries. The following discussion looks at the results using the adjusted antimonde.

Looking at specific industries, internal trade creation occurs in more than half of the industries, and net trade diversion is the general rule in all countries.<sup>1</sup> Net trade creation prevails in some industries primarily due to external trade creation rather than internal trade creation. The internal trade erosion in manufacturing as a whole is largely due to trade erosion in five industries--industrial chemicals (ISIC 351), metal products (ISIC 381), machinery (ISIC 382), electrical equipment (ISIC 383), and transport equipment (ISIC 384). The only exceptions to the rule are electrical equipment in Thailand and industrial chemicals in the Philippines. Not surprisingly, the above mentioned industries have higher tariff levels and small preference margins, but it is interesting to note that the average preference

		Without a	djustment			With adjustment <sup>a</sup>			
	Trade o	reation			Trade o	reation			
ISIC	Total	Internal	Trade diversion	Net	Total	Internal	Trade diversion	Net	
[otal <sup>b</sup>	- 5924.38	-4565.27	5155.04	-9720.31	- 3444 . 55	-4391.05	2849.43	-7240.4	
311	-58.25	-89.73	12.60	-102.33	448.23	-53.03	-457.17	404.1	
313	-7.27	1.62	4.94	-3.32	-0.02	3.78	-0.16	3.9	
314	na	na	na.	n.	114	na	na	na	
321	-311.79	-141.50	258.17	-399.67	-202.85	-132.35	158.39	-290.7	
322	-8.68	0.07	4.87	-4.80	-4.86	0.97	1.95	-0.9	
323	-7.30	0.05	6.75	-6.70	-5.68	0.13	5.21	-5.0	
324	-17.86	0.33	14.82	-14.49	-16.22	0.58	13.43	-12.8	
331	-149.12	-515.00	36.10	-551.10	-141.52	-511.24	32.26	-543.5	
332	-32.64	1.44	24.34	-22.90	-22.13	3.89	16.28	-12.3	
<u>341</u>	116.33	-16.87	-120.26	103.38	154.99	-15.31	-157.35	142.0	
342	-9.60	1.70	8.03	-6.32	-5.88	2.11	4.72	-2.6	
351	-363.68	-673.02	370.43	-1043.45	11.73	-656.93	11.10	-668.0	
352	-188.31	-32.51	170.50	-203.01	-71.13	-24.86	60.97	-85.8	
353	T.S.	ne	na	T.A.	na.	118	na	14	
354	ne	na.	na	na	TLA	na	na	<b>n</b> 4	
355	28.01	6.13	86.48	-80.35	84.30	11.89	35.95	-24.0	
356	-30.76	2.62	25.94	-23.32	-11.45	4.91	8.83	-4.0	
361	-28.14	0.00	20.60	-20.60	-25.10	0.78	18.34	-17.	
362	-110.99	5.58	103.71	-98.12	-103.74	6.23	97.11	-90.8	
369	-604.01	23.09	400.24	-377.15	-522.92	48.55	344.61	-296.0	
371	-395.69	29.54	370.24	-340.69	-248.16	35.23	228.39	-193.]	
372	-224.63	-17.21	207.14	-224.35	-205.58	-16.18	189.11	-205.	
381	-834.74	-798.53	598.88	-1397.41	-739.41	-780.24	521.83	-1302.0	
382	- 340.85	-1513.87	323.37	-1837.24	-7.54	-1500.99	2.93	-1503.9	
383	-1006.2/	-434./8	705.85	-1420.63	-//9.28	-445.91	. 141.14	-1195.	
384	-1241.32	-393.57	11/2.29	-1262.86	-970.54	-385.18	909.91	-1295.0	
382	-93.35	11.70	87.98	-/6.28	-81.31	12.35	/0.59	-64.2	
390	-3.46	-2.55	i 1.05	-3.60	21.55	i -0.14	-21.54	21	

Table 5.2a

Import Growth Approach: Indonesia

NOTES:

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na - Not available.

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a. Adjusts for differences in GDP growth, inflation changes, and exchange rate changes between Indonesia and the control country.
b. Total of all listed industries.

Source: United Nations, Industrial Statistics Yearbook, 1985.

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Table	5.2Ъ
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Import Growth Approach: Malaysia

	Without adjustment				With adjustment <sup>a</sup>			
	Trade c	reation			Trade c	reation		
ISIC	Total	Internal	Trade diversion	Net	Total	Internal	Trade diversion	Net
Total <sup>b</sup>	-6348.70	-4048.94	2299.77	-6348.70	-3221.61	-3598.31	-376.70	-3221.61
311	-296.54	-498.98	-202.44	-296.54	704.22	-259.36	-963.58	704.22
313	-14.78	2.92	17.69	-14.78	71.34	10.09	-61.24	71.34
314	THE	na.	TIA	na	na.	RE	na	TLE
321	-107.56	-39.50	68.06	-107.56	-30.95	-34.42	-3.48	-30.95
322	-0.33	9.05	9.38	-0.33	22.08	13.31	. <b>-8.77</b>	22.08
323	-26.83	. 1.04	27.87	-26.83	-13.98	2.20	16.19	-13.98
324	-0.94	0.26	1.21	-0.94	1.31	0.85	-0.46	1.31
331	-1336.50	-1293.76	42.75	-1336.50	-1306.77	-1274.43	32.34	-1306.77
332	5.41	2.11	-3.30	5.41	16.77	6.28	-10.49	16.77
341	-83.97	-41.01	42.96	-83.97	-10.98	-35.57	-24.58	-10.98
342	-27.68	6.90	34.59	-27.68	-2.70	15.27	17.96	-2.70
351	-393.36	-229.14	164.22	-393.36	-153.94	-219.37	-65.44	-153.94
352	54.36	8.45	-45.92	54.36	165.50	16.31	-149.19	165.50
353	TA	na	T.S.	118	na.	TA	T.A.	TE
354	TIA	TIA	TA	TLE	na.	na.	T.S.	na
355	-2.86	2.09	4.95	-2.86	62.81	34.60	-28.21	62.81
356	27.17	12.34	-14.83	27.17	66.69	16.52	-50.17	66.69
361	-144.81	0.00	144.81	-144.81	-105.26	0.00	105.26	-105.26
362	-107.07	6.50	113.57	-107.07	-94.69	7.75	102.44	-94.69
369	-69.05	20.76	89.80	-69.05	-6.28	41.73	48.00	-6.28
371	-31.93	12.73	44.66	-31.93	31.57	14.62	-16.95	31.57
372	-81.05	10.65	91.70	-81.05	-43.84	12.48	56.32	-43.84
381	-784.13	-319.67	464.46	-784.13	-685.84	-308.18	377.66	-685.84
382	-815.74	-562.86	252.88	-815.74	-579.49	-557.47	22.03	-579.49
383	-363.37	-1142.78	-779.41	-363.37	-35.02	-1099.52	-1064.50	-35.02
384	-1133.93	-19.88	1114.05	-1133.93	-802.59	-17.31	785.28	-802.59
385	-682.43	-5.65	676.78	-682.43	-637.57	1.80	639.38	-637.57
390	69.22	8.48	-60.74	69.22	146.00	13.52	-132.48	146.00

NOTES:

na - Not available.
a. Adjusts for differences in GDP growth, inflation changes, and exchange rate changes between Malaysia and the control country.
b. Total of all listed industries.

Source: United Nations, Industrial Statistics Yearbook, 1985.

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Tab	le	5.	2c
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Import Growth Approach: Philippines

		Without a	djustment		With adjustment <sup>a</sup>			
	Trade creation				Trade creation			
ISIC	Total	Internal	Trade diversion	Net	Total	Internal	Trade diversion	Net
Total	-7164.66	-206.53	7098.98	-7305.51	-3508.01	-144.60	3504.26	-3648.86
311	-37.40	-93.86	-21.37	-72.49	504.88	-48.50	-518.28	469.78
313	-27.37	0.00	27.37	-27.37	66.43	0.00	-66.43	66.43
314	na	74	na	na	na.	na	na.	na
321	-21.73	1.97	23.03	-21.06	61.71	2.03	-60.35	62.39
322	3.36	0.68	-2.71	3.39	4.15	0.68	-3.49	4.17
323	5.13	0.00	-5.23	5.23	7.50	0.00	-7.59	7.59
324	2.37	0.00	-2.37	2.37	2.47	0.00	-2.47	2.47
331	-45.16	0.00	21.86	-21.86	-40.17	0.00	16.88	-16.88
332	-2.06	0.00	2.04	-2.04	-0.43	0.00	0.40	-0.40
341	-130.40	0.24	128.77	-128.53	-33.04	0.35	31.53	-31.18
342	-51.05	0.07	48.96	-48.90	-29.54	0.71	28.10	-27.39
351	-1190.14	18.25	1198.63	-1180.37	-475.15	18.77	484.15	-465.38
352	-31.42	-1.75	31.26	-33.01	108.73	0.41	-106.73	107.14
353	T.A.	na	na	na	na	na	na	na
354	na	na	na	na	na	na	na	na
355	-18.71	1.65	124.92	-123.27	81.53	3.52	26.55	-23.03
356	-24.09	1.34	24.36	-23.02	3.65	1.34	-3.39	4.73
361	-64.86	0.00	64.86	-64.86	-49.59	0.00	49.59	-49.59
362	-91.85	0.21	. 91.52	-91.31	-79.19	0.28	78.93	-78.65
369	-139.13	0.45	138.00	-137.55	-99.03	0.60	98.05	-97.45
371	-445.70	1.38	445.90	-444.52	-229.04	1.38	229.24	-227.86
372	-291.50	-20.06	272.46	-292.51	-211.04	-14.27	197.78	-212.05
381	-723.36	-12.56	718.90	-731.46	-577.52	-11.62	574.00	-585.62
382	-1386.67	-83.22	1383.06	-1466.28	-850.04	-81.28	848.37	-929.64
383	-342.53	-1.46	341.25	-342.71	-131.70	-0.64	131.23	-131.87
384	-1875.82	-21.74	1809.04	-1830.78	-1373.29	-20.68	1307.57	-1328.25
385	-245.59	2.07	245.68	-243.61	-212.76	2.19	212.98	-210.78
390	11.02	-0.19	-11.21	11.02	42.45	6 0.11	-42.33	42.45

NOTES:

na = Not available.

a. Adjusts for differences in GDP growth, inflation changes, and exchange rate changes between the Philippines and the control country.
b. Total of all listed industries.

Source: United Nations, Industrial Statistics Yearbook, 1985.

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	Without adjus				With adjustment <sup>a</sup>			
	Trade o	reation			Trade o	reation		
ISIC	Total	Internal	Trade diversion	Net	Total	Internal	Trade diversion	Net
Total <sup>b</sup>	-8814.90	18423.29	7335.26-	25758.55	- 3773 . 62	17285.16	3432.10-	20717.26
311	642.35	-921.66	-392.16	-529.50	1861.03	-382.64	-1071.82	689.18
313	-3.28	4.61	-4.76	9.37	125.78	26.76	-111.67	138.43
314	na	na	DA	na	T.S.	na	ne.	па
321	-121.13	-87.57	156.31	-243.88	34.18	-75.71	11.86	-88.57
322	124.05	104.21	-44.12	148.33	191.00	116.76	-98.52	215.28
323	-137.03	3.67	123.76	-120.09	-67.43	8.95	59.43	-50.48
324	-52.57	3.56	23.04	-19.48	-35.59	8.42	10.92	-2.50
331	-1998.68	-13632.67	89.15-	13721.83	-1756.08	-13414.14	65.09-	13479.23
332	24.26	10.39	-21.93	32.33	60.04	15.64	-52.47	68.11
341	-19.27	-23.05	20.40	-43.46	43.70	-19.55	-39.06	19.52
342	-84.48	3.48	77.96	-74.48	-48.81	5.70	44.50	-38.80
351	-245.24	-319.24	235.42	-554.66	27.25	-309.26	-27.09	-282.17
352	69.13	17.55	-31.96	49.51	271.77	33.80	-218.35	252.14
353	na	DA	na	T.E.	na	ne	TIA.	na
354	na	DE	TLE.	na.	T.E.	T.S.	na.	па
355	65.55	16.56	-105.72	122.28	215.47	157.98	-114.22	272.20
356	-22.25	15.41	13.64	1.77	119.57	35.75	-107.83	143.58
361	-325.90	6.71	328.15	-321.44	-225.61	7.83	228.98	-221.15
362	-236.46	15.53	223.82	-208.29	-215.72	17.35	204.90	-187.55
369	-318.93	16.74	251.10	-234.35	-183.57	35.72	134.70	-98.99
371	-883.38	10.08	875.82	-865.74	-848.88	10.51	841.74	-831.24
372	-168.05	67.37	240.97	-173.60	-122.36	73.07	200.99	-127.92
381	-1265.11	-320.17	1181.04	-1501.22	-1097.78	-310.25	1023.64	-1333.89
382	-532.28	-1207.00	598.88	-1805.88	-293.52	-1199.78	367.34	-1567.12
383	-745.75	-1989.42	1051.24	-3040.66	24.61	1922.51	347.80	-2270.30
384	-1260.45	-256.97	1134.84	-1391.82	-884.70	-251.31	764.76	-1016.07
385	-1446.48	11.64	1409.77	-1398.13	-1402.66	12.61	1366.92	-1354.32
390	126.48	26.96	-99.41	126.37	434.69	34.14	-400.43	434.58

Table 5.2d

Import Growth Approach: Singapore

NOTES:

na - Not available.

a. Adjusts for differences in GDP growth, inflation changes, and exchange rate changes between Singapore and the control country.
b. Total of all listed industries.

Source: United Nations, Industrial Statistics Yearbook, 1985.

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Table	5.	2e
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Import Growth Approach: Thailand

	Without adjustment				With adjustment <sup>e</sup>			
·	Trade o	reation			Trade c	reation		
ISIC	Total	Internal	Trade diversion	Net	Total	Internal	Trade diversion	Net
Total <sup>b</sup>	-3795.84	-253.56	3809.58	-4063.14	-1437.16	-222.16	1482.30	-1704.46
311	171.75	9.84	-161.35	171.19	353.28	20.03	-332.69	352.72
313	23.12	0.00	-23.12	23.12	45.87	0.00	-45.87	45.87
314	na	na	na.	na	na	na	na	na
321	-39.07	1.11	41.58	-40.47	33.98	1.53	-31.05	32.58
322	-2.21	0.12	1.83	-1.71	3.18	0.32	-3.36	3.68
323	-8.25	0.00	8.09	-8.09	-4.36	0.00	4.20	-4.20
324	-2.02	-0.06	1.24	-1.30	-1.25	0.06	0.58	-0.53
331	-132.35	-77.90	83.49	-161.39	-110.32	-75.66	63.69	-139.35
332	-0.18	0.00	0.13	-0.13	3.11	0.00	-3.15	3.15
341	-71.38	3.15	73.57	-70.42	1.32	3.40	1.12	2.28
342	-30.33	0.92	29.73	-28.81	-17.82	1.28	17.58	-16.30
351	-249.62	-132.57	251.65	-384.22	150.57	-126.48	-142.46	15.98
352	1.92	-4.54	-0.76	-3.78	161.88	1.29	-154.89	156.18
353	na	114	na.	na	na	<b>114</b>	na	na
354	na.	na.	na	na	na	na	na	na
355	47.40	2.12	11.90	-9.78	105.97	3.33	-45.46	48.79
356	-17.36	2.72	17.92	-15.20	31.80	3.13	-30.84	33.96
361	-50.75	i <b>0.0</b> 0	50.75	-50.75	-34.04	0.00	34.04	-34.04
362	-78.66	1.91	. 79.42	-77.51	-69.46	2.02	2 70.33	-68.30
369	-98.66	i 0.36	98.18	-97.82	-69.70	0.36	69.22	-68.86
371	-11.01	. 0.97	/ 10.97	-9.99	74.87	0.97	7 -74.92	75.89
372	-225.20	) 1.65	5 222.18	-220.53	-158.66	1.65	5 155.64	-153.99
381	-659.00	) -6.68	8 659.03	-665.71	-546.48	-6.06	5 547.14	-553.20
382	-559.22	2 <b>-73.0</b> 2	2 572.05	-645.07	-270.77	-71.84	284.78	-356.62
- 383	-125.33	3 33.20	0 170.38	-137.19	82.34	34.4	L -36.07	70.49
384	-1628.22	2 -21.88	3 1555.67	' -1577.55	-1234.22	2 -21.09	9 1162.47	-1183.56
385	-175.67	7 4.27	7 178.91	174.64	-156.05	5 4.2	7 159.29	-155.01
390	124.48	8 0.7	5 -123.87	124.62	187.80	0.93	2 -187.02	187.94

NOTES :

na = Not available.

a. Adjusts for differences in GDP growth, inflation changes, and exchange rate changes between Thailand and the control country. b. Total of all listed industries.

Source: United Nations, Industrial Statistics Yearbook, 1985.

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margins are relatively large in Thailand and the Philippines in electrical equipment and industrial chemicals, respectively, at about 20 percent, suggesting that the PTA may have had a positive effect in these industries for the two countries.

Internal trade creation occurs in at least 13 of the 24 industries in all countries. The most important of these are printing and publishing (ISIC 342), rubber products (ISIC 355), plastic products (ISIC 356), glass products (ISIC 362), non-metal products (ISIC 369), and iron and steel (ISIC 371).

The volume of trade created is low in printing and publishing and in glass and glass products (ranging from less than \$1 million in the Philippines to \$2 million in Indonesia for glass products and less than \$1 million in the Philippines to \$6 million in Indonesia in glass products), except in Malaysia where trade creation amount to \$15 million and \$8 million in the two industries, respectively. Tariff rates are relatively low in printing and publishing, averaging between 20 and 25 percent in the four resource-rich countries and are somewhat higher for glass products (about 30-35 percent except in Thailand where it is 60 percent). Preference margins are relatively large in the Philippines (15-20 percent) and Malaysia (13 percent), and may have had some affect on imports, though in the case of the Philippines the effect is small. Preferences offered are close to zero in Indonesia for both product groups and may explain the lack of trade creation. In Thailand, preferences are very low in printing and publishing but about 20 percent in glass and glass products. Trade creation, however, is negligible in both.

The results for metal manufactures and iron and steel are equally inconclusive. A significant amount of trade is created in both Indonesia and Malaysia and negligible amounts in the Philippines and Thailand. Tariffs for metals are high with averages between 30 and 50 percent, and average preferences offered are 20 percent in Thailand, 10 percent in Malaysia, 15 percent in the Philippines, and 5 percent in Indonesia. Average tariffs for iron and steel are lower at about 20 percent in all four countries. Preferences are also lower, averaging 10 percent in Thailand and the Philippines and negligible in Indonesia and Malaysia. The lower preferences being offered by the countries with the largest trade creation effects imply that the PTA has had little effect in these industries.

The effect of the PTA is also unclear in terms of rubber and plastic products. Tariff rates are very high, especially for rubber tires in Indonesia and Malaysia and plastic products in Thailand, and preference margins are close to zero. The only exception is the Philippines where tariff rates in both average 30 percent and preference margins 15 percent. It is unlikely that the PTA is responsible for the trade created in these industries with the possible exception of the Philippines. But trade created in this case is very small.

The trade created in furniture (ISIC 332) is also important in Malaysia. Average preference margins are 12 percent on a 44 percent average tariff rate in Malaysia and may have some affect on imports. Thailand and the Philippines import little or no furniture from the other ASEAN countries as they are important exporters. High tariffs rates may also deter imports. Thailand offers no preferences on its 56

percent tariff rate, but the Philippines does offer a 20 percent MOP on its 45 percent average tariff.

The above indicates that except in a few heavy industries, intra-ASEAN trade generally grows faster among ASEAN countries than Korean imports from ASEAN countries adjusted for growth, inflation, and exchange rate changes. However, in cases where trade creation seems to occur, the preferential rate being offered is such that it is unlikely to have been an important factor in the rapid growth. There are a few exceptions in the Philippines and Malaysia and in electrical equipment in Thailand, where trade creation of modest proportions may be occurring as a result of preferential tariffs.

B. Shares of Apparent Consumption

The changes in the domestic shares (DS) and the shares of partners (PS) and non-partner imports (WS) in apparent consumption (domestic production plus imports and tariff revenues less exports) offer an alternative approach to estimating ex-post results. These shares are estimated both with and without using a control country as described in Chapter IV.

Table 5.3 presents a summary of six logically possible configurations of changes in the three shares, DS, PS, and WS. Case (3) is the expected pattern, but as discussed by Truman (1972), all the cases with the exception of (5) and (6) are consistent with the model. Cases (1) and (2) result if there is a downward adjustment to a common external tariff, while Case (4) occurs if there is an increase in the common external tariff. In the case of ASEAN, where internal tariff barriers still exist and are lowered rather than eliminated and external

Tab	le	5	3

Possible Patterns of Changes in the Three Basic Shares

Case	Description	Domestic	Partners	Non-members
(1)	Double (internal and external) trade creation	-	+	+
(2)	External trade creation and internal trade diversion	-	-	+
(3)	Internal trade creation and external trade diversion	-	+	-
(4)	External trade diversion and external trade erosion	+	+	-
(5)	Double (external and internal) trade erosion	+	-	-
(6)	Internal trade diversion and internal trade erosion	+	-	+

Source: Truman (1972).

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tariffs are not standardized, cases (5) and (6) are also possible. A country may raise its individual tariffs vis-a-vis partners and the rest of the world and result in case (5), or lower (raise) tariffs on some products that are more actively traded with non-members (members) and result in case (6).

1. Results with no control country

As can be seen in Tables 5.4a-e, the shares of apparent consumption with partners increase slightly in Malaysia, the Philippines, Singapore, and Thailand for manufactures as a whole, while the shares of non-partners decline. Of the three, both Singapore and Thailand have declining domestic shares. Both countries, therefore, exhibit the classic case of internal trade creation and external trade diversion. Internal trade creation is valued at \$234 million in Thailand and \$889 million in Singapore. In Singapore, trade creation is larger than trade diversion, but in Thailand trade diversion outstripped trade creation.

In Malaysia and the Philippines domestic shares are positive, and therefore following Table 5.3, there is external trade diversion and external trade erosion in both countries. Internal trade creation is smaller in all cases than trade diversion. The increase in internal trade shares amounts to 0.02 percent (\$260 million) and 0.01 percent (\$75 million) in Malaysia and the Philippines, respectively.

In Indonesia, domestic shares increase while partner and non-partner shares decrease (Case 5), indicating that imports of manufactures did not increase significantly as a share of apparent consumption in Indonesia either from ASEAN or from the rest of the world. Rather, it appears that the import-substitution policy of the

# Table 5.4a

# Index of Apparent Consumption of Indonesia (no control country, 1974-75 and 1983-84)

ISIC	Change in shares				
	Domestic	ASEAN	Rest of the world	Internal trade creation	External trade diversion
3	0.06	-0.00	-0.05	-125.36	2743.22
311/312	9.15	0.04	-0.19	65.22	345.23
313	0.02	-0.01	-0.01	-1.06	1.91
314	0.01	-0.00	-0.01	-0.23	11.51
321	0.05	-0.02	-0.03	-31.08	45.58
322	-0.58	-0.09	0.67	-0.61	-4.60
323	-0.01	-0.00	0.01	-0.07	-0.26
324	-0.04	0.00	0.04	0.02	-2.08
331	0.05	-0.03	-0.02	-3.66	2.49
332	0.01	-0.02	0.01	-0.51	-0.21
341	-0.16	-0.01	0.17	-3.40	-81.08
342	-0.01	-0.00	0.01	-0.12	-2.26
351	0.06	0.02	-0.07	38.73	192.20
352	0.25	-0.02	-0.23	-18.34	185.71
355	0.90	-0.10	-0.80	-81.60	688.27
356	0.06	-0.01	-0.06	-1.51	12.33 ·
361	0.29	-0.08	-0.21	-3.02	7.47
362	0.13	0.01	-0.13	1.00	19.40
369	0.28	-0.11	-0.17	-61.33	99.32
371	0.43	-0.02	-0.41	-37.67	728.05
372	na	na	na	na	na
381	0.03	-0.07	0.04	-76.91	-43.47
382	-0.03	0.00	0.02	13.91	-60.35
383	0.07	0.03	-0.09	38.27	139.37
384	0.18	0.02	-0.19	39.83	466.02
385	-0.03	0.00	0.03	0.86	-5.56
390	0.01	-0.05	0.05	-2.09	-1.79

<u>Sources</u>: United Nations, <u>Industrial Statistics Yearbook</u>, 1985; <u>Commodity</u> <u>Trade Statistics</u>, various years. UNIDO, Consolidated Industrial Statistics Data.
#### Table 5.4b

### Index of Apparent Consumption of Malaysia (no control country, 1974-75 and 1983-84)

	Cha	inge in shar			
ISIC	Domestic	Rest o ASEAN the wor		Internal trade creation	External trade diversion
3	0.02	0.02	-0,04	260.34	421.84
311	0.22	-0.04	-0.18	-135.07	609.53
313	0.04	-0.00	-0.04	-0.90	10.35
314	0.03	0.00	-0.03	0.44	11 53
321	0.01	0.01	-0.02	6.64	13.14
322	-0.26	0.10	0.15	6.70	-9.99
323	0.02	0.03	-0.05	0.50	0.86
324	0 00	-0.21	0 21	-2.48	-2 48
331	-0.02	0.02	0.00	4.42	-0.21
332	-0.12	-0.00	0.12	-0.01	-10.99
341	0.08	-0.01	-0.07	-3.31	25.38
342	0.02	-0.02	-0.00	-7 76	0 42
351	0.19	0.02	-0.22	44 13	384 64
352	0.02	0.02	-0.04	12 56	23 40
355	-0 01	-0.01	0.04	-15 92	-29 07
356	-0.01	0.01	0.02	8 55	-18 98
361	-0.10	0.00	0.07	0.00	-4 59
362	0.04	0.00	-0.06	2 37	6 44
369	0.04	-0.04	-0.00	-28 92	10 72
371	0.05	-0.04	-0.01	-5.68	138 11
372	0.00	0.08	-0.08	17 22	17 22
381	-0.03	-0.01	0.04	-7 24	-37 21
382	-0.05	0.01	-0.02	30.70	37 76
383	-0.33	0.02	-0.02	285 26	-773 03
38%	-0.33	0.05	-0.03	203.20	-773. <del>3</del> 3 /0 1/
385	-0.02	-0.12	-0.05	-33 52	49.14 20 76
390	-0.02	0.03	-0.00	4.36	0.41

<u>Sources</u>: United Nations, <u>Industrial Statistics Yearbook</u>, 1985; <u>Commodity</u> <u>Trade Statistics</u>, various years. UNIDO, Consolidated Industrial Statistics Data.

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#### Table 5.4c

## Index of Apparent Consumption of the Philippines (no control country, 1974-75 and 1983-84)

	Cha	inge in sha				
ISIC	Domestic	ASEAN	Rest of the world	Internal trade creation	External trade diversion	
3	0.04	0.01	-0.05	75.33	283.57	
311	0.07	-0.00	-0.06	-7.41	146.84	
313	-0.01	0.00	0.01	0.00	-9.67	
314	-0.00	0.00	0.00	0.00	-2.90	
321	-0.08	0.00	0.08	2.30	-63.86	
322	-0.12	0.02	0.10	0.68	-3.55	
323	-0.14	0.00	0.14	0.00	-2.88	
324	-0.99	0.00	0.00	0.00	-0.29	
331	0.01	0.00	-0.01	0.00	0.73	
332	-0.14	0.00	0.14	0.00	-0.84	
341	0.04	0.00	-0.04	0.81	17.51	
342	-0.00	-0.00	0.00	-0.12	-0.76	
351	0.04	0.03	-0.07	28.64	73.22	
352	0.01	0.00	-0.01	0.51	6.48	
355	0.02	0.00	-0.02	0.99	5.10	
356	-0.00	0.01	-0.01	1.34	0.88	
361	-0.01	0.00	0.01	0.00	-0.28	
362	0.05	0.00	-0.05	0.16	6.23	
369	-0.05	0.00	0.05	0.47	-4.93	
371	0.15	0.00	-0.15	1.38	154.11	
372	-0.11	0.08	0.03	6.22	-2.57	
381	-0.05	0.01	0.03	4.45	-13.07	
382	-0.04	0.02	0.02	11.56	-14.65	
383	-0.10	0.02	0.08	18.21	-70.38	
384	0.10	0.01	-0.11	3.49	69.22	
385	-0.07	0.03	0.04	1.95	-3.20	
390	0.00	-0.01	0.01	-0.29	-0.27	

<u>Sources</u>: United Nations, <u>Industrial Statistics Yearbook</u>, 1985; <u>Commodity</u> <u>Trade Statistics</u>, various years. UNIDO, Consolidated Industrial Statistics Data.

#### Table 5.4d

# Index of Apparent Consumption of Singapore (no control country, 1974-75 and 1983-84)

	Cha	nge in sha				
ISIC	Domestic	ASEAN	Rest of the world	Internal trade creation	External trade diversion	
3	-0.03	0.03	-0.00	888.99	414,46	
311	0.02	0.02	-0.04	42.86	78.31	
313	-0.02	-0.03	0.05	-6.64	-11.51	
314	-0.33	0.01	0.32	1.50	-49.59	
321	-0.12	0.06	0.06	56.70	-61.61	
322	0.01	0.12	-0.14	58.02	64.23	
323	-0.07	0.00	0.06	0.40	-5,68	
324	-0.18	-0.10	0.28	-9.46	-27.00	
331	-0.25	0.23	0.02	72.19	-4.80	
332	-0.10	0.01	0.09	2.22	-18.46	
341	0.05	0.01	-0.06	3.74	24.52	
342	0.09	-0.01	-0.08	-3.04	41.68	
351	-0.04	0.01	0.02	12.92	-24.35	
352	0.10	0.04	-0.13	26.31	99.23	
355	-0.28	-0.04	0.32	-14.58	-116.11	
356	-0.02	-0.00	0.02	-0.15	-7.09	
361	0.00	0.06	-0.06	5.88	5.88	
362	-0.01	0.06	-0.05	8.35	6.31	
369	0.02	-0.02	0.01	-21.71	-4,97	
371	0.04	0.01	-0.04	5.52	42.48	
372	-0.13	0.37	-0.24	102.51	66.57	
381	0.14	-0.01	-0.13	-12.31	186.64	
382	-0.08	0.04	0.04	106.64	-123.45	
383	0.08	0.07	-0.15	423.00	930.27	
384	-0.29	0.00	0.29	1.72	-659.20	
385	0.00	0.00	-0.00	1.24	1.24	
390	-0.12	0.07	0.05	25.26	-19.07	

Sources: United Nations, Industrial Statistics Yearbook, 1985; Commodity <u>Trade Statistics</u>, various years. UNIDO, Consolidated Industrial Statistics Data.

#### Table 5.4e

# Index of Apparent Consumption of Thailand (no control country, 1974-75 and 1983-84)

	Cha	nge in sha				
ISIC	Domestic	Rest o ASEAN the wor		Internal trade creation	External trade diversion	
3	-0.01	0.01	-0.01	233.90	779.88	
311	-0.02	0.00	0.02	30.78	-110.22	
313	-0.02	0.00	0.02	0.00	-26.29	
314	-0.00	0.00	0.00	0.80	-2.51	
321	0.00	0.00	-0.00	4.03	6.78	
322	0.01	-0.00	-0.01	-0.46	9.21	
323	-0.05	0.00	0.05	0.00	-1.93	
324	-0.02	-0.00	0.02	-0.13	-2.39	
331	-0.13	0.14	-0.01	61.71	4.21	
332	-0.01	0.00	0.01	0.00	-3.48	
341	0.10	0.00	-0.10	4.40	119.19	
342	-0.01	0.00	0.00	0.63	-0.73	
351	0.06	0.01	-0.07	18.29	125.42	
352	0.09	-9.00	-0.09	-3.16	123.67	
355	-0.03	0.00	0.03	1.22	-30.17	
356	-0.03	0.01	0.02	2.56	-9.13	
361	-0.05	0.00	0.05	0.00	-4.75	
362	0.03	0.01	-0.04	1.58	10.19	
369	0.06	0.00	-0.06	0.36	52.24	
371	-0.09	0.00	0.09	0.97	-121.92	
372	0.06	0.00	-0.06	1.65	34.40	
381	0.02	0,01	-0.03	7.96	26.21	
382	0.01	0.01	-0.02	24.42	38.08	
383	-0.08	0.04	0.03	68.89	-54.94	
384	0.15	0.00	-0.15	2.71	585.32	
385	0.02	0.02	-0.04	4.27	10.08	
390	0.00	0.00	-0.00	0.41	3.34	

<u>Sources</u>: United Nations, <u>Industrial Statistics Yearbook</u>, 1985; <u>Commodity</u> <u>Trade Statistics</u>, various years. UNIDO, Consolidated Industrial Statistics Data.

country resulted in increasing shares of domestic production in total apparent consumption across most industries.

Internal trade creation is more widespread across industries in Malaysia. Trade creation in electrical machinery (ISIC 383) is large, accounting for the bulk of trade created in manufactures. Other important industries where internal trade creation occurs include industrial chemicals (ISIC 351), machinery (ISIC 382), and transport equipment (ISIC 384). Trade erosion, especially external trade erosion, is also prevalent in Malaysia indicating that like Indonesia, imports are being replaced by domestic production. However, unlike Indonesia, this is often done at the expense of non-partner countries. Internal trade erosion occurs less frequently.

In several industries, virtually all imports come from non-ASEAN sources in the Philippines, but partner shares of apparent consumption increase in most categories with non-zero imports. Industrial chemicals (ISIC 351) and electrical and non-electrical machinery (ISIC 382 and 383) account for the bulk of trade created. The results indicate that although external trade erosion and diversion prevail for manufacturing as a whole, in terms of specific industries, the Philippines has become a more open country, and trade erosion is significant in only a few industries. Those cases where external trade erosion occur are largescale manufacturing activities--food products (ISIC 311/312), paper and paper products (ISIC 341), industrial chemicals (ISIC 351), iron and steel (ISIC 371) and transport equipment (ISIC 384).

In Singapore, trade creation is large in some industries, most notably, food products (ISIC 311/312), textiles (ISIC 321), wearing

apparel (ISIC 322), wood products (ISIC 331), non-ferrous metals (ISIC 372), and electrical and non-electrical machinery (ISIC 382 and 383). Its ASEAN partners have become a more important component of its trade while the share of non-partners in apparent consumption has dropped.

Even more than in any other country trade creation occurs in Thailand in virtually all industries where there are non-zero imports from ASEAN. The most important industries are food products (ISIC 311/312), wood products (ISIC 331) and electrical and non-electrical machinery (ISIC 382 and 383). External trade diversion is pronounced in capital-intensive industries such as chemicals and transport equipment.

2. Using a control country

The results are normalized using Korea as a control country in an analogous manner to the import growth approach. Both adjusted and unadjusted results are presented in Tables 5.5a-e.

ASEAN shares in apparent consumption increase with domestic shares generally declining in all countries in terms of total manufacturing. According to the possible configurations delineated in Table 5.2, there is internal trade creation, implying that the PTA may be having some positive effect in increasing intra-regional trade. The results for all countries are similar in both the adjusted and unadjusted cases, with trade erosion or negative trade creation only in a few industries including other chemicals (ISIC 352), rubber products (ISIC 355), and other industries (ISIC 390). In the cases where internal trade erosion occurs in the adjusted results, trade diversion also occurs implying the presence of import-substituting policies. The largest values of trade creation are found in industrial chemicals (ISIC 351), metal products

	Change in	shares	(unadjusted)			Change in	shares	(adjusted)	T	External trade diversion
ISIC	Domestic	ASEAN	Rest of the world	trade creation	External trade diversion	Domestic	ASEAN	Rest of the world	trade creation	
3	-0.06	0.05	0.35	5419.80	-8723.70	-0.07	0.05	-0.33	5502.31	3311.70
311	0.02	0.07	-0.20	135.88	135,88	-0.01	0.08	-0.38	152.86	697.35
313	0.00	0.00	0.07	0.00	0.00	-0.01	0.00	-0.04	0.00	6.26
314	0.00	0.00	-0,01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
321	-0.08	0.08	0.19	132.89	132.89	-0.08	0.08	-0.18	132.94	288.60
322	-0.58	0.00	24.95	0.00	0.00	-0.58	0.00	0.00	0.00	0.01
323	-0.41	0.00	0.19	0.00	0.00	-0.45	0.00	-0.03	0.00	0.90
324	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
331	-0.08	4.78	0.32	623.38	623.38	-0.08	4.79	-0.03	625.38	4.12
332	0.00	0.00	0.03	0.00	0.00	-0.01	0.00	-0.28	0.00	6.06
341	-0.02	0.05	0.13	25.18	25.18	-0.03	0.05	-0.40	25.55	191.26
342	-0.01	0.00	0.08	0.00	0.00	-0.02	0.00	-0,09	0.00	14.17
351	-0.03	0,38	0.34	966.78	966.78	-0.03	0.37	-0.34	947.75	864.25
352	0.00	0,02	-0.04	12.63	12.63	0.00	0.02	-0.38	16.34	310.93
355	0.00	-0.10	1.99	-86.42	-86.42	0.00	0.00	-0.56	2.87	476.74
356	0.00	0.00	-0.02	0.00	0.00	-0.01	0.00	-0.14	0.00	30.62
361	-0.01	0.00	1.31	0.00	0,00	-0.01	0.00	-0.24	0.00	8.68
362	-0.10	0.00	0.77	0.00	0,00	-0,10	0.00	-0.25	0.00	36.32
369	-0.02	0.00	0.64	0.00	0.00	-0.02	0.00	-0.30	0.00	172.53
371	0.00	0.00	0.15	0.00	0,00	0.00	0.00	-0,69	0.00	1228.80
381	-0.10	0.75	0.72	842.05	842.05	-0.11	0.75	-0.27	842.56	303.83
382	-0.01	0.49	0.05	1396.74	1396.74	0.00	0.49	0.50	1409.20	-1447.22
383	-0.06	0.29	0.41	435.85	435.85	-0.06	0.28	-0.33	429.62	508.65
384	-0.13	0.39	1.42	936.35	936.35	-0.13	0.38	0.16	918.01	-375.14
385	-0.02	0.00	0.92	0.00	0.00	-0.02	0.00	0.17	0.00	-34.54
390	0.06	-0.04	-0.37	-1.52	-1.52	0.03	-0.02	-0.47	-0.77	18.51

Index	of	Apparent	Consump	tion	of	Indonesia,	Normalized
		(	1974-75	and	198	3-84)	

Table 5.5a

<u>Sources</u>: United Nations, <u>Industrial Statistics Yearbook</u>, 1985; <u>Commodity Trade Statistics</u>, various issues. UNIDO, Consolidated Industrial Statistics Data.

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Index of Apparent Consumption of Malaysia, Normalized (1974-75 and 1983-84)

	Change in shares		(unadjusted)	Internal	Pressonal	Change in	shares	(adjusted)	Internal	Protection - 1
ISIC	Domestic	ASEAN	Rest of the world	trade creation	trade diversion	Domestic	ASEAN	Rest of the world	trads creation	trade diversion
3	-0.07	0.12	0.30	7180.18	-7138.82	0.00	0.10	-0.37	6857.15	4064.03
311	0.03	0.24	-0.17	821.25	562.00	0.07	0.03	-0.36	107.62	1220.98
313	0.00	0.00	0.41	0.00	-116.11	0.00	0.00	-0.22	0.00	61.36
314	0.00	0.00	-0,07	0.00	30,76	0.00	0.00	0.00	0.00	0.00
321	-0.06	0.12	0.36	81.67	-241.41	-0.02	0.11	-0.37	74.87	251.01
322	-0.53	0.00	29.53	0.00	-1907.78	-0.53	0.00	-0.03	0.00	1.71
323	-0.16	0.00	1.43	0.00	-25.38	-0.07	0.00	-0.38	0.00	6.69
324	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
331	-0.07	7.59	0.27	2224.22	-78.99	-0.06	7.49	-0.03	2196.65	7.95
332	0.00	0.00	0.01	0.00	-0.53	0.04	0.00	-0.06	0.00	5.43
341	-0.01	0.13	0.17	47.52	-62.67	0.01	0.11	-0.57	41.12	215.46
342	-0.01	0.00	0.03	0.00	-37.29	0.00	0.00	-0.09	0.00	42.35
351	-0.06	0.29	0.28	522.41	-499.71	0.01	0.34	-0.41	612.23	734.78
352	0.00	0.02	-0.04	10.16	21.08	0.06	-0.01	-0.44	-7.55	261.08
355	0.00	-0.01	0.03	-17.97	-41.39	0.09	-0.01	-0.02	-18.26	18.63
356	0.00	0.00	-0.02	0.00	5.65	0.03	0.00	-0.15	0.00	40.70
361	0.00	0.00	3.52	0.00	-176.62	0.00	0.00	-0.65	0.00	32.76
362	-0.07	0.00	1.13	C.00	-122.61	-0.06	0.00	-0.38	0.00	40.91
369	-0.03	0.00	0.33	0.00	-242.84	-0.01	0.00	-0.16	0.00	119.15
371	-0.01	0.00	0.11	0.00	-135.43	0.00	0.00	-0.50	0.00	621.31
381	-0.12	0.39	0.67	360.19	-614.88	-0.09	0.39	-0.27	358.32	-251.24
382	-0.01	0.29	0.05	556.57	-98.78	0.00	0.33	0.39	634.31	766.71
383	-0.09	0.75	0.29	2427.27	-934.57	-0.03	0.82	-0.30	2679.31	-979.89
384	-0.19	0.09	1.33	150.95	-2243.43	-0.17	0.11	0.09	186.19	153.31
385	0.00	0.00	0.85	0.00	-238.17	0.00	0.00	0.14	0.00	38.57
390	0.07	-0.03	-0.37	-4.06	60.27	0.12	-0.05	-0.68	-7.66	-109.22

<u>Sources</u>: United Nations, <u>Industrial Statistics Yearbook</u>, 1985; <u>Commodity Trade Statistics</u>, various issues. UNIDO, Consolidated Industrial Statistics Data.

Table	5.	5c
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Index of Apparent Consumption of the Philippines, Normalized (1974-75 and 1983-84)

	Change in shares (unadjusted			Internal	Rut over a 1	Change in	Change in shares (adjusted)			Patorol
ISIC.	Domestic	ASEAN	Rest of the world	trade creation	trade diversion	Domestic	ASEAN	Rest of the world	trade creation	trade diversion
3	-0.09	0.01	0.23	144.60	-1840.21	-0.05	0.01	-0.25	133.61	1674.97
311	0.04	0.03	-0.08	78.02	184.11	0.10	0.03	-0.17	60.98	400.00
313	0.00	0.00	0.10	0.00	-83.98	0.00	0.00	-0.05	0.00	44.27
314	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
321	-0.09	0.00	0.11	0.33	-88,91	-0.03	0.00	-0.11	0.31	91.82
322	-0.98	0,00	1.18	0.00	-40.38	-0.98	0.00	0.00	0.00	0.01
323	-0.25	0.00	1.10	0.00	-22,58	-0.21	0.00	-0.20	0.00	4.13
324	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
331	-0.08	0.00	0.16	0.00	-17.52	-0.08	0.00	-0.02	0.00	1.74
332	0.00	0.00	0.00	0.00	-0.01	0,01	0.00	-0.02	0.00	0.09
341	-0.03	0.00	0.07	0.32	-30.34	0.01	0.00	-0.22	0.30	99.93
342	-0.01	0.00	0.10	0.00	-15.85	-0.01	0.00	-0.11	0.00	17.87
351	-0.05	0.01	0.30	5.62	-316.15	-0.02	0.01	-0.38	6.14	400.19
352	0.01	0.00	-0.01	1.29	13.00	0.05	0.00	-0.15	0.29	151.97
355	0,00	0,00	0.38	-0.67	-79.72	0.02	0.00	-0.13	-0.68	27.95
356	0.00	0.00	-0.01	0.00	1.62	0.02	0,00	-0.07	0.00	11.40
361	-0.01	0.00	1.37	0.00	-27.20	-0.01	0.00	-0.25	0.00	5.02
362	-0.13	0.00	0,37	0.00	-44.01	-0.12	0.00	-0.12	0.00	14.55
369	-0.04	0.00	0.22	0.00	-24.62	-0.03	0.00	-0.11	0.00	11.90
371	-0.02	0.00	0.07	0.00	-75.59	0.01	0.00	-0.35	0.00	360.73
381	-0.14	0.02	0.60	6.67	232.13	-0.12	0.02	-0.24	6.65	-92.51
382	-0.01	0.04	0,05	27.12	30.91	0.01	0.05	0.35	31.43	229.61
383	-0.12	0.02	0.24	14.31	215.09	-0.08	0.02	-0.23	15.06	-203.40
384	-0.34	0.02	1.00	11.74	645.59	-0.32	0.02	0.08	13.42	53.84
385	-0.06	0.00	0.90	0.00	65.81	-0.06	0.00	0.14	0.00	10.20
390	0,00	-0.01	-0.55	-0.15	-16.44	0.00	-0.01	-0.97	-0.27	-29.13

<u>Sources</u>: United Nations, <u>Industrial Statistics Yearbook</u>, 1985; <u>Commodity Trade Statistics</u>, various issues. UNIDO, Consolidated Industrial Statistics Data.

Table :	5.	5d
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Index of Apparent Consumption of Singapore, Normalized (1974-75 and 1983-84)

	Change in shares (unadjusted)			) Jatoral	- Putanal	Change in	shares (	adjusted)	. Internal	P
1510	Domestic	ASEAN	Rest of the world	trade creation	de trade tion diversion	Domestic	ASEAN	Rest of the world	trade creation	trade diversion
3	-0.04	0.23	0.41	29393.83	-28743.70	0.00	0.20	-0.50	28378.15	6353.88
311	0.02	0.63	-0.17	1391.15	377.90	0.05	0.03	-0.37	63.10	821.02
313	0.00	0.00	0.64	0.00	-148.05	0.00	0.00	-Ó.34	0.00	78.24
314	0.00	0.00	-0,17	0.00	26,50	0.00	0.00	0.00	0.00	0.00
321	-0.01	0.24	0.66	229.47	-639.48	0.00	0.22	-0.68	212,46	658.62
322	-0.37	0.00	40.38	0.00	-19201.50	-0.37	0.00	-0.04	0.00	20.81
323	-0.10	0.00	1.76	0,00	-161.94	-0.03	0.00	-0.49	0.00	45.13
324	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
331	-0,04	69.11	0.50	21665.21	-157.28	-0.03	68.17	-0.05	21368.72	15.85
332	0.00	0.00	0.03	0.00	-5.30	0.03	0.00	-0.27	0.00	54.69
341	-0.01	0.10	0.17	38,51	-69.41	0.01	0.08	-0.59	33.38	238.34
342	-0.01	0.00	0.22	0.00	-111.04	0.00	0.00	-0.25	0.00	126.15
351	-0.01	0.38	0.40	376.44	-403.01	0.00	0.44	-0.59	441.76	594.23
352	0.00	0.03	-0.05	21.87	39.68	0.03	-0.02	-0.66	-18.21	491.34
355	0.00	-0.09	0.01	-31.75	-4.31	0.09	-0.09	-0.01	-32.27	1.94
356	0.00	0.00	-0.05	0.00	16.68	0.02	0.00	-0.34	0.00	120.07
361	0.00	0.00	5.29	0.00	-510.86	0.00	0.00	-0.98	0.00	94.82
362	-0,03	0.00	1.79	0.00	-248.52	-0.02	0.00	-0.60	0.00	82.86
369	-0.02	0.00	0.68	0.00	-596.80	-0.01	0.00	-0.34	0.00	293.31
371	0.00	0.00	0.15	, 0.00	-147.95	0.00	0.00	-0.69	0.00	666,95
381	-0.09	0.26	0.94	385.88	1382.60	-0.07	0.26	-0.39	383.90	-564.60
382	-0.01	0.37	0.05	1067.54	142.02	0.00	0.41	0.41	1189.29	1165.83
383	-0.05	0.65	0.40	3947.34	2424.16	-0.02	0.72	-0.42	4367.36	-2554.14
384	-0.32	0.14	1.03	305,61	2319.00	-0.29	0.17	0.07	375.14	160.75
385	0.00	0.00	0.99	0.00	680.66	0.00	0.00	0.17	0.00	113.61
390	0.07	-0.01	-0.39	-3.43	-149.51	0.12	-0.02	-0.70	-6.47	-270.95

<u>Sources</u>: United Nations, <u>Industrial Statistics Yearbook</u>, 1985; <u>Commodity Trade Statistics</u>, various issues. UNIDO, Consolidated Industrial Statistics Data.

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Index	of	Apparent	Consump	ption	of	Thailand,	Normalized
		(1	1974-75	and	1983	3-84)	

	Change in shares (unadjusted)		ge in shares (unadjusted)			Change in shares (adjusted)			T	D
181C	Domestic	ASEAN	Rest of the world	trade creation	trade diversion	Domestic	ASEAN	Rest of the world	trade creation	trade diversion
3	-0.11	0.00	0.13	578.34	-6267.51	-0.01	0.00	-0.15	608.30	2465.27
311	0.05	0.00	-0.01	17.14	62.10	0.13	0.00	-0.02	3.54	134.93
313	0.00	0.00	0.02	0.00	-29.06	0.00	0.00	-0.01	0.00	15.36
314	0.00	0.00	0.00	0.00	0.80	0.00	0.00	0.00	0.00	0.00
321	-0.10	0.00	0.06	5.46	-196.70	-0.03	0.00	-0.07	4.98	205.38
322	-0,99	0.00	0.81	0.00	-1431.55	-0,99	0.00	0.00	0.00	1.07
323	-0.43	0.00	0.08	0.00	-3.31	-0.20	0.00	-0.02	0.00	0.83
324	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
331	-0.08	0.40	0.23	175.92	-102.44	-0.06	0.40	-0.02	173.93	10.29
332	0.00	0.00	0.00	0.00	-0.19	0.04	0.00	-0.01	0.00	2.00
341	-0.04	0.00	0.06	2.37	-71.54	0.03	0.00	-0.21	2.05	245.53
342	-0.01	0.00	0.07	0.00	-15.97	0.00	0,00	-0.08	0.00	18.12
351	-0.05	0.12	0.31	201.77	-531.60	0.00	0.14	-0.45	235.37	774.40
352	0.01	0.01	-0.02	7.22	30,23	0.08	0.00	-0.26	-4.67	373.55
355	0.00	0.00	0.10	-0.90	-95.89	0.09	0.00	-0.05	-0.91	43.16
356	0.00	0.00	-0.01	0,00	4.29	0.03	0.00	-0.08	0.00	30.87
361	-0.01	0.00	0.93	0.00	-89.05	0.00	0.00	•0.17	0.00	16.51
362	-0.13	0.00	0.31	0.00	-89.09	-0.11	0.00	-0.10	0.00	29.72
369	-0.04	0.00	0.19	0.00	-156.49	-0.02	0.00	-0.09	0.00	76.66
371	-0.02	0.00	0.06	0.00	-85.42	0.00	0.00	-0.28	0.00	396.02
381	-0.14	0.01	0.56	12.22	496.04	-0.11	0.01	-0.23	12.15	-202.47
382	-0.03	0.04	0.04	71.76	72.71	0.02	0.04	0.27	82.76	547.05
383	-0.11	0.03	0.27	44.69	443.43	-0.04	0.03	-0.28	49.15	-461.29
384	-0.51	0.01	0.61	40.93	2359.38	-0.48	0.01	0.04	50.39	162.18
385	-0.18	0.00	0.70	0.00	186.72	-0.18	0.00	0.11	0.00	29.72
390	0.21	0.00	-0.06	-0.24	-91.63	0.39	0.00	-0.12	-0.45	-166.06

<u>Sources</u>: United Nations, <u>Industrial Statistics Yearbook</u>, 1985; <u>Commodity Trade Statistics</u>, various issues. UNIDD, Consolidated Industrial Statistics Data. (ISIC 381), machinery (ISIC 382), electrical machinery (ISIC 383), and transport equipment (ISIC 384). The important industries are generally the same in the normalized and non-normalized cases, though trade creation is more prevalent with normalization.

C. Summary of Ex-post Analysis

The mixed results make it difficult to make any definitive conclusions. It is uncertain if internal trade creation occurred at all in terms of total manufacturing because of the conflicting results. In terms of specific commodities, trade creation was evident in most commodities in all approaches, but industries where trade creation was especially large under the apparent consumption approach are industries where trade erosion was prevalent in the import growth approach. Furthermore, the industries where trade creation was large were often not industries where margins of preferences offered were large. There are some exceptions particularly in Malaysia and the Philippines where tariff preferences may be important in some industries.

Several factors could account for the relatively large increase in intra-ASEAN trade despite the low preferences being offered. First, intra-industry trade has increased in the region and would be expected to be more important among ASEAN countries than between ASEAN countries and Korea. Second, Singapore continues to be an important entrepôt and processing center for the region. Finally, the closer ties and business relationships that have been developed through ASEAN may have had an important effect on trade.

#### III. Ex-ante Analysis of Intra-ASEAN Trade

The third ASEAN Summit represents a bold step by ASEAN to increase regional cooperation. The impetus at this juncture is to find new avenues for economic growth and export expansion. Yet each individual country hopes to expand their exports to partner countries and to concurrently encourage domestic production. Not surprisingly, there is some fear that imports from partner countries may expand enough with increased trade preferences so as to hurt domestic industrialization targets. These fears, if not assuaged, will check the progress of the ASEAN PTA. As discussed in Chapter IV, other studies estimating the effect of enhanced integration find that the increase in intra-ASEAN trade will be modest, suggesting the fears may be unfounded. But it is necessary to consider other factors than just the possibilities for trade creation or trade diversion, that is changing patterns in exports, production, and consumption.

#### A. Methodology

This section uses the Tyer's approach described in Chapter IV to determine the trade and production effects of reductions in tariffs in manufactures. Applying this approach, the effects of discriminatory and nondiscriminatory tariff cuts are examined. Different trade liberalization policies are considered: (1) extending a 20 percent preferential cut across the board on all manufactured goods within ASEAN; (2) extending a 50 percent tariff preferential cut over 5 years within ASEAN, using a slower rate of reduction to account for the 7 years allowed for the Philippines and Indonesia under the agreements reached at the third summit; and (3) total trade liberalization within

ASEAN, accomplished over 10 years. The 20 percent scenario was selected because this is close to average preferences now being offered. Instead of selected commodities in the present PTA, however, all manufactured goods are considered. The second case follows the agreement at the third summit, while the last case considers what may happen should ASEAN decide to create a free trade area.

The equation used for the analysis in final form is:

$$-\mathbf{k}_{\mathsf{h}\mathsf{i}\mathsf{j}} = \left[ \left( \mathbf{e}_{\mathsf{h}\mathsf{i}\mathsf{j}} / \sigma_{\mathsf{i}} \right) \ \mathbf{s}_{\mathsf{h}\mathsf{j}}^{\bullet} - 1 \right] \ \hat{\mathbf{X}}_{\mathsf{h}\mathsf{i}\mathsf{j}} + \mathbf{e}_{\mathsf{i}\mathsf{j}} / \sigma_{\mathsf{j}} \ \underset{\ell\neq i}{\Sigma} \ \mathbf{s}_{\ell \mathsf{i}\mathsf{j}}^{\bullet} \hat{\mathbf{X}}_{\ell \mathsf{i}\mathsf{j}} \\ + \frac{\Sigma}{\mathsf{k}\neq \mathsf{j}} \ \mathbf{e}_{\mathsf{h}\mathsf{j}\mathsf{k}} / \sigma_{\mathsf{k}} \ \underset{\ell}{\Sigma} \ \mathbf{s}_{\ell \mathsf{k}}^{\bullet}$$

where  $k_{hij}$  introduces exogenous disturbances and

$$k_{hij} = \eta_{hi}\hat{Y}_{i} + \frac{\Sigma}{k} e_{hijk} (g^{\bullet}_{hik} + g^{m}_{hik}).$$

The equation can be rewritten in matrix form:

AX = K, and solved  $X = A^{1}K$ ; where X is a 36 X 1 matrix, A is a 36 X 36 matrix and K is a 36 X 1 matrix.

There are six demand countries for manufactured goods and six supply sources. Therefore, the demand function contains 36 equations, of which 6 are domestic demand equations and 30 are import demand equations. For each commodity, there are 36 unknowns of  $X_{hij}$ ,  $P_{hij}^m$ , and  $P_{hij}$ , and 6 unknown producer prices,  $P_{ij}$ .

B. Data Used

The import share data are calculated as an average of two years, 1983 and 1984, taken from the United Nations, <u>Commodity Trade</u> <u>Statistics</u>, Series D. The two-year average was used to avoid fluctuations due to unusual years. Because the import data are in SITC (standard international trade classification), the data are then

converted to the ISIC (international standard industrial classification) 3-digit level using the UWM.SITCISIC. CONC3. There are several problems with this data. First, Singapore does not publish any statistics on trade with Indonesia, thus Indonesia's data are used and converted with a CIF/FOB ratio of 10 percent. This may underestimate the flow between the two countries as more trade between Indonesia and Singapore is purported to take place than reported by Indonesian statistics. Second, there is a further discrepancy between the trade of Singapore and its corresponding trade with the other ASEAN countries, in particular, Malaysia. Both Malaysia and Singapore report as exports goods that are essentially produced in Malaysia but sent through Singapore. This may result in a double counting of some trade flows. No attempt is made to correct this problem because there is no consistent method that can be used, and thus the figures may overstate intra-ASEAN trade. Third, in cases when import shares of ASEAN countries are zero, 10<sup>4</sup> is used to avoid undefined growth rates. Finally, the conversion to ISIC data could not adjust for SITC 4 and 5-digit differences as these amounts are often too small to be reported in the trade data of the individual countries, especially broken down by partners. As these data are used only to calculate trade shares, it is believed that this discrepancy does not significantly affect the results.

Values for internal trade, exports, and imports for all of the countries except Indonesia at the ISIC 3-digit level are obtained from the "Consolidated Industrial Statistics Data" of the Global Branch Database of UNIDO in U.S. dollars. Indonesian production data are from the United Nations, <u>Industrial Statistics Yearbook</u>, 1985 and trade data

from the United Nations, <u>Commodity Trade Statistics</u>, 1983 and 1984. Commodity exports are subtracted from average gross output for 1983 and 1984 to obtain estimates for domestically-consumed production, or internal trade. In some cases, the estimate for domestically-consumed production is negative; hence negative numbers are changed to 10<sup>4</sup> or when total exports of the country are very high domestically-consumed production is assumed to be 25% of total exports. The import and production data used in this study are presented in Tables 5.19a-e in Appendix E. The ISIC classification is presented in Table 5.18 in

Tariff data are nominal tariffs from the United Nations, Trade Information System. Specific tariffs are converted to ad valorem rates using unit values. Import sales and surtaxes are included for Indonesia, Malaysia, and Thailand. Because in many cases trade data of the ASEAN countries are sufficiently not detailed, U.S. or Singaporean trade data are used to calculate unit values. Since both countries are relatively open to world trade, it is believed that the unit values are more likely to represent world prices. The data are at the CCCN 7-digit level and are converted to ISIC 3-digit levels. Unweighted averages of ad valorem duties are used. Balassa (1962) points out that unweighted averages are superior to weighted averages because high levels of duties that totally restrict imports, i.e, prohibitive tariffs, are given little weight. A 20 percent import duty is assumed for non-partners as a group. Since the model looks at changes in tariffs and its effect on price and the change in tariff for the rest of the world is zero in most

cases, the assumption does not affect the results. Tariff data are presented in Table 5.6.

At the conceptual level it is preferable to use effective protection rates, but these are not available for the years and degree of aggregation required. Further, as Baldwin (1984) observes, effective protection rates are found to be closely correlated to nominal protection rates, and therefore the issue is not very important from a practical point of view. Unfortunately, the effect of non-tariff barriers are not considered, and therefore the amount of trade created may be overstated. However, non-tariff barriers were found (Chapter III) to be less prevalent in manufacturing.

Literature searches are conducted to find import price, import income, and production elasticities. Because of the importance of elasticity estimates, sensitivity analyses are conducted in all cases.

No good import price elasticities for the ASEAN countries at a disaggregated level are found. In Lim (1985), several studies are made estimating price and substitution elasticities for a few specific items traded between ASEAN and Australia. But most of the results are of the wrong sign and/or insignificant. Khan (1974) finds the overall import price elasticity in the Philippines to be -2.7, but no disaggregated estimates are available. Deaton (1988) estimates elasticities for a few agricultural products for Indonesia. Therefore, U.S. elasticity estimates by Stone (1979), Deardorff and Stern (1986) and Cline et al. (1978) are selected and adjusted in the following manner.

First, elasticity estimates of 150 studies collected by Stern et al. (1976) show that although there is some variation by product,

Average Tariffs, 1985

151C	Indonesia	Malaysia	Philippines	Singapore	Thailand	Rest of the world
3	1.41	1.41	1.32	1.22	1.48	1.20
312	1.58	1.23	1.44	1.01	1.90	1.20
313	2.30	3.04	1.53	4.95	2.03	1.20
314	1.64	3.44	1.65	3.35	1.33	1.20
321	1.42	1.37	1.36	1.00	1.62	1.20
322	2.79	1.47	1.49	1.04	1.86	1.20
323	1.38	1.34	1.36	1.00	1.67	1.20
324	1.69	1.47	1.47	1.00	1.67	1.20
331	1.27	1.23	1.26	1.00	1.29	1.20
332	1.49	1.44	1.45	1.02	1.56	1.20
341	1.34	1.20	1.28	1.00	1.42	1.20
342	1.23	1.17	1.25	1.00	1.23	1.20
351	1.21	1.19	1.19	1.18	1.35	1.20
352	1.29	1.16	1.25	1.00	1.47	1.20
353	1.15	1.15	1.19	1.04	1.18	1.20
354	1.15	1.04	1.10	1.00	1.12	1.20
355	1.35	1.70	1.26	1.00	. <b>1.50</b>	1.20
356	1.43	1.48	1.38	1.01	1.73	1.20
361	2.09	1.42	1.50	1.00	1.99	1.20
362	1.35	1.37	1.34	1.00	1.60	1.20
369	1.38	1.34	1.33	1.00	1.52	1.20
371	1.22	1.14	1.20	1.00	1.21	1.20
372	1.21	1.15	1.23	1.00	1.21	1.20
381	1.54	1.26	1.32	1.00	1.36	1.20
382	1.24	1.16	1.22	1.01	1.26	1.20
383	1.32	1.32	1.30	1.00	1.37	1.20
384	1.35	1.28	1.24	1.01	1.34	1.20
385	1.25	1.14	1.20	1.00	1.34	1.20
390	1.51	1.21	1.36	1.00	1.39	1.20

NOTE:

a. Simple averages of seven-digit CCCN tariffs.

Source: United Nations, Trade Information System.

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there is a strong tendency toward unity. Several articles question the results and suggest that there is a downward bias due to specification error resulting from various factors including theoretical problems such as simultaneous shifts in both demand and supply curves (Orcutt 1950), and measurement problems such as neglecting to take account of prohibitive tariffs or quality improvements (Balassa and Kreinin 1967). In addition to the possible downward bias, Kreinin (1967) finds that the imports are more responsive to tariff changes than equivalent changes in import prices. They estimate elasticities with respect to tariff changes to be between 4 and 6, considerably higher that those calculated with respect to changes in import price. This may in part be due to the downward bias of estimates of import-price elasticities but may also be due to the expectation of the relative permanence of tariff changes by importers. Therefore, when estimates are available in more than one source, the higher estimate is generally selected. Still, as can be seen in Table 5.7, the estimated elasticities range between 1 and 3 and can be viewed as a low end estimate.

Second, deVries (1951) finds import-demand elasticities to be negatively correlated with the share of imports in domestic consumption. He finds that U.S. import-demand elasticities average about -2.0 for commodities where the ratio of imports to domestic consumption exceeds the average for all products and -3.4 for products where the import to domestic consumption ratio is below average. Hence, following Balassa and Kreinin (1967), individual country differences in price elasticities are estimated using U.S. import-demand elasticities and import to domestic consumption ratios as a weight.<sup>2</sup>

	Table	5.7
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Price Elasticities\*

1 <b>SIC</b>	Indonesia	Malaysia	Philippines	Singapore	Thailand	Rest of the world
3	0.30	0.35	0.68	0.18	0.88	1.53
312	0.43	0.55	1.14	0.13	3.00	1.08
313	3.00	0.95	2.47	0.38	3.00	1.08
314	3.00	0.57	3.00	0.04	3.00	1.08
321	0.34	0.15	0.33	0.05	0.90	1.47
322	0.87	1.21	3.00	0.89	3.00	2.16
323	3.00	1.51	1.58	0.93	3.00	1.74
324	3.00	1.11	0.30	1.51	3.00	1.72
331	3.00	1.93	3.00	0.03	1.16	1.50
332	0.72	1.28	1.70	0.55	3.00	1.83
341	0.15	0.17	0.47	0.15	0.76	1.54
342	0.23	0.21	Û.21	0.13	0.30	1.91
351	0.34	0.54	0.40	0.17	0.40	1.75
352	0.39	0.18	0.54	0.11	0.45	1.75
353	0.00	0.44	1.99	0.16	0.91	1.58
354	0.00	0.01	0.01	0.11	0.02	1.58
355	3.00	3.00	3.00	1.33	6.92	2.92
356	1.05	0.40	1.43	0.22	0.98	2.50
361	3.00	1.90	3.00	1.30	3.00	2.15
362	0.47	0.22	1.02	0.10	1.05	1.88
369	0.37	0.36	0.43	0.17	2.10	2.15
371	0.05	0.05	0.09	0.03	0.06	1.83
372	0.00	0.24	0.16	0.01	0.62	1.82
381	0.36	0.36	0.43	0.34	0.56	2.37
382	0.17	0.18	0.19	0.09	0.26	1.45
383	0.43	0.32	0.55	0.32	0.53	1.69
384	0.69	0.58	0.96	0.41	2.26	2.09
385	0.16	0.16	0.17	0.11	0.24	1.83
390	0.34	0.34	0.06	0.23	2.22	1.66

NOTE:

a. Calculated using the formula nm = n C/M + e P/M,

- where C = domestic consumption;
  - P = domestic production;
  - n domestic elasticity of demand;
  - e = domestic elasticity of supply;
  - nm = import-demand elasticity.

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Estimates of overall import-income elasticities tend to fall within a limited range in the neighborhood of 1.5 in most countries (cf. Houthakker and Magee 1969). Khan (1974) finds that import-income elasticity for the Philippines is lower than the norm at 0.668. Estimates looking at import elasticities by sector are rare. Viane's (1986) estimates for German data on a sectoral and partner country basis are lower than the overall import-income elasticities most commonly found. The arithmetic average of these are a low of .357 for SITC 3, .519 for SITC 0+1, .619 for SITC 5-9 and 1.133 for SITC 2+4. Because of the lack of good estimates, 1.5 is used in all countries for all commodities.

The elasticity of substitution in import demand also has few empirical estimates (Stern et al. 1976). As a result, it is not possible to distinguish differing substitution elasticities by importer and product. The few estimates available do not support any differentiation by product or country. Hickman and Lau (1978), as cited in Cline et al. (1978), find estimates ranging between 1.13 and 1.73. However, Cline et al. (1978) shows that these estimates are biased downward due to product aggregation. Other studies (Armington 1969) use 3 but do not offer any theoretical justification. Cline et al. (1978) uses 2.5 for all product categories as a compromise. Because other studies using the Armington approach find that the results are the most sensitive to this parameter, subscitution elasticities of 2 and 3 are attempted in this study.<sup>3</sup>

Disaggregated supply elasticities for the ASEAN countries are not found in the literature, though Khan (1974) finds that the overall

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export-supply elasticity of the Philippines is very low at 0.751. Several estimates of these elasticities are attempted, but because other studies and sensitivity analysis in this study show that the results are not sensitive to changes in supply elasticities, low end elasticity estimates between 1 and 0.8 are used and are presented in Table 5.8.<sup>4</sup>

C. Discussion of Results

1. 20 percent across-the-board tariff reduction

The change in economic welfare (as discussed in Chapter II) comes about because resources and consumption are reallocated with a reduction in tariff rates. Production for the domestic market will decrease as imports expand, allowing for more efficient allocation of resources. At the same time total consumption will increase. The total of the two effects are the welfare gain to the economy. Cut at the same time, more efficient non-partner producers may be replaced by producers in partner countries and entail a welfare loss to the importing country. The net effect must be examined.

With a 20 percent preferential tariff reduction and assuming no growth in income, ASEAN as a whole would experience a net welfare gain of \$1.32 million (Table 5.21 in Appendix E). The largest net gains are in Thailand (\$891 thousand) and Malaysia (\$628 thousand). The Philippines and Singapore would experience smaller gains (\$79 thousand and \$89 thousand, respectively) while Indonesia would experience a net welfare loss of \$376 thousand. Trade creation in Indonesia is relatively large (second only to Malaysia) but trade diversion is larger than in the other countries.<sup>5</sup> Higher tariff levels and the relatively high shares of trade conducted with partners in the initial period

Table	5.	8
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Elastici	ities	and	Income	Growth
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Income	Supply	Income growth <sup>a</sup>
0.8	0.7	0.050
1.0	1.0	0.065
0.8	0.7	0.064
1.0	1.0	0.108
0.9	0.8	0.081
	Income 0.8 1.0 0.8 1.0 0.9	Income Supply   0.8 0.7   1.0 1.0   0.8 0.7   1.0 1.0   0.8 0.7   1.0 1.0   0.9 0.8

NOTE:

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a. Estimated growth for 1991 from Project Link, 1989.

explain the high trade creation in Indonesia, while the relatively high import to total consumption ratio appears to explain the large trade diversion (see Chapter II).

This kind of welfare analysis assumes that the changes will cancel out such that the trade balance and total production in the countries remain the same. But these other factors must be considered to get a true idea of the welfare effect. In addition, a major portion of trade creation is due to the decrease in production for domestic consumption, which is unlikely to be considered to as a positive phenomenon by most countries. For the remainder of the chapter, changes in exports, imports, and production will be considered instead of the welfare gains or losses through trade creation and trade diversion.

Tables 5.9a-e show that imports from other ASEAN countries increase sharply while imports from non-partners decline in the resource-rich countries. In most cases, the increase in imports from other ASEAN countries is larger than the decrease in imports from the rest of the world and total imports increase. In Singapore, however, the increase in ASEAN imports is small due to its low initial tariffs and imports from the rest of the world increase.

Although there are significant changes in the direction of trade for most countries, the percentage change in total production, imports, and consumption in manufactures as a whole or in any one industry is very small, i.e., less than 1 percent on average. Total imports and total consumption generally increase, though the increase in consumption is less than the increase in total imports because of declining production for the domestic market. Production increases in most

#### Table 5.9a

#### Changes in Imports and Production for Domestic Consumption, Indonesia (with a 20% reduction in tariffs)

		Im	ports		_	
ISIC	Production domestic consumption (%)	ASEAN (%)	Rest of the world (%)	Increase in intra-ASEAN imports (US\$m)	Decrease in imports from the rest of the world (US\$m)	
Total	-0.18	8.36	-0.25	57.93	25.09	
311/312	-0.66	13.40	-0.90	17.26	4.24	
313	-0.22	22.38	0.32	0.36	-0.01	
314	-0.03	16.02	0.30	0.02	-0.01	
321	-0.01	10.73	-0.03	0.36	0.11	
322	-0.01	21.17	-0.02	0.01	0.00	
323	0.00	8.23	-0.02	0.00	0.00	
324	0.01	13.96	0.05	0.05	-0.00	
331	0.01	6.72	-0.10	0.04	0.00	
332	-0.24	10.97	-0.69	0.16	0.05	
341	-0.07	9.50	-0.17	0.68	0.55	
342	-0.04	7.09	-0.17	0.12	0.03	
351	-0.64	6.26	-0.16	8.11	2.98	
352	-0.03	8.21	-0.13	0.53	0.22	
355	-0.03	10.26	0.01	0.64	-0.01	
356	-0.04	11.05	-0.13	0.29	0.02	
361	-0.00	19.95	-0.01	0.00	0.00	
362	-0.18	8.26	-0.38	0.46	0.10	
369	-0.36	10.12	-0.33	2.34	0.28	
371	-0.06	6.84	-0.15	2.02	1.45	
381	-0.15	13.11	-0.43	4.04	2.14	
382	-0.22	4.62	-0.21	5.47	5.60	
383	-0.16	5.65	-0.27	4.58	2.51	
384	-0.15	9.60	-0.29	9.80	4.28	
385	-0.10	4.46	-0.25	0.52	0.49	
390	0.01	8.32	-0.23	0.06	0.07	
Adjusted	-0.21	8.32	-0.25	57.54	25.11	

NOTE:

a. Less ISIC 313 and 314.

#### Table 5.9b

### Changes in Imports and Production for Domestic Consumption, Malaysia (with a 20% reduction in tariffs)

		Im	ports		_	
ISIC	Production domestic consumption (%)	ASEAN (%)	Rest of the world (%)	Increase in intra-ASEAN imports (US\$m)	Decrease in imports from the rest of the world (US\$m)	
Total	-0.43	6.49	-0.31	84.46	29.26	
311/312	-0.64	7.07	-0.03	17.62	0.21	
313	-0.58	26.57	0.30	1.24	-0.15	
314	-0.04	28.25	0.21	0.30	-0.04	
321	-0.27	9.34	-0.48	2.60	1.35	
322	-1.06	9.78	-0.78	1.21	0.27	
323	-0.19	8.33	-0.19	0.13	0.02	
324	-0.13	10.30	-0.17	0.06	0.02	
331	-0.13	6.39	-0.12	1.25	0.01	
332	-0.08	10.76	-0.18	0.34	0.03	
341	-0.33	6.07	-0.23	1.01	0.50	
342	-0.12	5.34	-0.30	0.75	0.13	
351	-0.45	5.79	-0.05	5.40	0.40	
352	-0.19	4.67	-0.31	1.51	0.75	
355	-0.00	16.36	0.00	0.38	-0.00	
356	-0.32	11.32	-0.69	1.51	0.41	
361	0.00	10.89	-0.01	0.00	0.00	
362	-0.52	8.90	-0.75	0.72	0.33	
369	-0.29	9.16	-0.50	3.03	0.56	
371	-0.04	4.71	-0.10	0.93	0.68	
381	-0.20	7.36	-0.32	2.86	1.24	
382	-0,09	2.33	-0.11	1.69	1.99	
383	-3,04	6.18	-0.69	32.40	16.30	
384	-0.21	8.04	-0.30	7.02	3.76	
385	-0.25	1.67	-0.08	0.22	0.21	
390	-0.08	2.35	-0.24	0.28	0.26	
Adjusted <sup>a</sup>	-0.44	6.40	-0.32	82.92	29.45	

NOTE:

a. Less ISIC 313 and 314.

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#### Table 5.9c

# Changes in Imports and Production for Domestic Consumption, Philippines (with a 20% reduction in tariffs)

		Im	ports		Decrease in imports from the rest of the world (US\$m)	
ISIC	Production domestic consumption (%)	ASEAN (%)	Rest of the world (%)	Increase in intra-ASEAN imports (US\$m)		
Total	-0.04	7.72	-0.06	8.94	3.21	
311/312	-0.08	11.67	0.01	3.40	-0.01	
313	0.00	13.64	0.33	0.00	-0.18	
314	0.00	15.85	0.31	0.00	-0.01	
321	-0.03	10.48	-0.03	0.25	0.04	
322	0.04	10.41	0.07	0.07	-0.00	
323	0.00	9.79	-0.02	0.00	0.00	
324	-0.00	12.20	0.01	0.00	-0.00	
331	-0.00	7.83	-0.11	0.00	0.00	
332	0.00	12.14	-0.03	. 0.00	0.00	
341	-0.01	8.57	-0.06	0.08	0.06	
342	-0.01	7.81	-0.05	0.03	0.01	
351	-0.24	5.87	-0.07	1.71	0.44	
352	-0.01	7.27	-0.07	0.22	0.11	
355	-0.00	8.26	0.02	0.14	-0.00	
356	-0.04	10.64	-0.06	0.14	0.01	
361	-0.00	12.46	-0.01	0.00	0.00	
362	-0.01	8.80	-0.04	0.02	0.00	
369	-0.02	9.33	-0.08	0.05	0.01	
371	-0.00	6.54	-0.02	0.09	0.05	
381	-0.06	9.17	-0.14	0.49	0.21	
382	0.03	4.25	-0.13	0.58	1.99	
383	-0.11	6.50	-0.10	1.28	0.42	
384	-0.02	7.33	0.01	0.31	-0.03	
385	-0.09	3.82	-0.12	0.08	0.08	
390	0.24	9.46	-0.01	0.00	0.00	
Adjusted	-0.05	7.72	-0.06	8.94	2.15	

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a. Less ISIC 313 and 314.

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#### Table 5.9d

# Changes in Imports and Production for Domestic Consumption, Singapore (with a 20% reduction in tariffs)

		In	ports		Decrease in imports from the rest of the world (US\$m)	
ISIC	Production domestic consumption (%)	ASEAN (%)	Rest of the world (%)	Increase in intra-ASEAN imports (US\$m)		
Total	-1.41	0.29	0.35	7.47	-51.43	
311/312	-1.38	0.12	0.37	0.83	-2.72	
313	-1.48	30.15	-0.89	2.89	0.80	
314	-0.49	27.13	-0.62	0.75	0.47	
321	-1.63	0.29	0.16	0.33	-1.38	
322	-3.84	1.89	0.61	2.17	-1.11	
323	-2.69	0.26	0.10	0.01	-0.07	
324	-2.24	0.15	0.13	0.01	-0.09	
331	-1.31	0.61	0.57	1.35	-0.12	
332	-1.06	1.44	0.52	0.17	-0.38	
341	-0.82	0.19	0.18	0.04	-0.46	
342	-0.04	0.26	0.10	0.01	-0.09	
351	-0.63	5.68	-0.10	2.74	0.96	
352	-0.74	0.31	0.20	0.22	-0.80	
355	-0.18	0.03	0.04	0.01	-0.05	
356	-0.59	1.06	0.45	0.21	-0.57	
361	-3.48	0.02	0.02	0.00	-0.01	
362	-2.04	0.39	0.22	0.07	-0.21	
369	-0.37	0.56	0.42	0.16	-1.30	
371	-0.19	0.05	0.01	0.01	-0.11	
381	-0.34	0.37	0.24	0.14	-1.42	
382	-2.84	1.05	0.60	1.96	-16.15	
383	-3.72	-0.87	0.66	-7.08	-20.78	
384	-0.38	0.61	0.06	0.13	-1.18	
385	-2.98	0.28	0.41	0.05	-2.73	
390	-4.25	0.94	0.68	0.30	-1.96	
Adjusted <sup>*</sup>	-1.42	0.15	0.36	3.83	-52.70	

NOTE:

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a. Less ISIC 313 and 314.

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#### Table 5.9e

# Changes in Imports and Production for Domestic Consumption, Thailand (with a 20% reduction in tariffs)

		Im	ports		D	
ISIC	Production domestic consumption (%)	ASEAN (%)	Rest of the world (%)	Increase in intra-ASEAN imports (US\$m)	imports from the rest of the world (US\$m)	
Total	-0.06	9.62	-0.08	28.33	5.15	
311/312	-0.03	18.10	0.10	7.02	-0.23	
313	0.00	20.00	0.33	0.00	-0.14	
314	-0.18	10.36	0.25	0.08	-0.01	
321	-0.05	15.34	0.01	0.84	-0.03	
322	-0.01	18.22	-0.01	0.05	0.00	
323	-0.00	15.38	-0.02	0.00	0.00	
324	0.00	15.47	0.01	0.00	-0.00	
331	-0.55	8.43	-0.65	5.31	0.04	
332	-0.00	14.04	-0.03	0.00	0.00	
341	-0.03	10.85	-0.10	0.59	0.17	
342	-0.02	7.23	-0.08	0.09	0.01	
351	-0.22	9.67	-0.13	3.60	1.39	
352	-0.05	12.09	-0.15	1.33	0.37	
355	-0.00	13.24	0.01	0.28	-0.01	
356	-0.07	16.30	-0.09	0.46	0.04	
361	-0.00	19.01	-0.01	0.00	0.00	
362	-0.05	13.26	-0.07	0.27	0.02	
369	-0.00	12.99	-0.02	0.05	0.00	
371	-0.00	6.84	-0.01	0.07	0.04	
381	-0.06	10.11	-0.11	0.96	0.27	
382	-0.15	5.58	-0.10	1.66	1.27	
383	-0.17	6.49	-0.24	4.76	1.93	
384	-0.02	9.95	0.06	0.54	-0.44	
385	-0.35	7.07	-0.02	0.30	0.03	
390	-0.06	11.12	-0.26	0.10	0.42	
Adjusted <sup>*</sup>	-0.05	9.62	-0.08	28.25	5.29	

NOTE:

a. Less ISIC 313 and 314.

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industries by a small amount, though in Indonesia, Malaysia, and Singapore it declines slightly overall. Total exports increase in most industries in the resource-rich countries by somewhat more in percentage terms than consumption, production, or imports despite declining exports to non-partner countries. Thailand has the largest percentage increase in total exports, while the Philippines has the largest percentage increase in exports to ASEAN countries. In Singapore, the effect on exports is mixed, with export growth in the various industries fluctuating by up to 4 percent in both directions.

Changes in the pattern of imports and exports projected by the model correspond to the industrial pattern of comparative advantage discussed in Chapter III in most instances. The results are misleading in some cases, however, because of zero or near zero trade in some commodities. In particular, crade in beverages (ISIC 313) and tobacco (ISIC 314) within the region is nearly non-existent, except for a small amount of trade between Indonesia and Singapore, and Malaysia and Singapore. Coupled with the extremely high tariff levels in Indonesia, Malaysia, and Singapore, increases in exports and imports projected by the model are exceedingly high. It is probable, however, that with preferential rates intra-ASEAN trade in these commodities would expand significantly should preferences be offered. But it is not likely that exports and imports in all countries would increase to the degree suggested by the model. At the same time, tariffs in these sectors are for the purpose of reducing consumption rather than protecting domestic producers. For these reasons, an adjusted total excluding beverages and tobacco is presented at the bottom of the tables. The following

discussion does not consider beverages and tobacco. These commodities are affected by the problem of zero or near zero trade in the initial period. Several other commodities are mentioned as deemed necessary in the discussion of country experiences.

For manufactures as a whole excluding ISIC 313 and 314, imports from other ASEAN countries increased by \$4 million in Singapore to \$83 million in Malaysia. Total adjusted manufactured imports increase in all countries because of large percentage increases in partner shares, but the increase is less than 1 percent (in value terms this ranged from \$7 million in the Philippines to \$56 million in Singapore). Exports to the rest of the world decline in all countries, but due to the large increase in exports to other ASEAN countries, exports as a whole increase by about 1 percent in all countries except for Malaysia and Singapore, where exports decline slightly (Table 5.10). This increase in exports improves the balance of trade by less than 0.5 percent in Thailand, and by 4 percent in the Philippines (where the initial trade deficit is the lowest), but is not enough to cover the increase in imports in Indonesia or Malaysia. The trade balance in Indonesia worsens by 0.2 percent or \$17 million. In Malaysia and Singapore, the increase in exports to other ASEAN countries is not enough to cover the decline in exports to the rest of the world. Total exports of manufactured goods declines by 0.5 percent in Malaysia and by 2 percent in Singapore, leading to a worsening balance of trade position.

Production for domestic consumption decreases in all of the ASEAN countries, but Table 5.11 shows that total manufacturing production increases in the Philippines and Thailand but declines slightly in

Table	5.10
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	Total exports				Exports to ASEAN					
ISIC	Indo- nesia (%)	Malay- sia (%)	Philip- pines (X)	Singa- pore (%)	Thai- land (%)	Indo- nesia (X)	Halay- sia (X)	Philip- pines (X)	Singa- pore (%)	Thai- land (%)
Total	0.57	-0.52	0.69	-1.91	0.77	2.42	1.09	6.37	6.35	5.18
311/312	0.53	-0.13	0.14	-1.09	1.12	3.45	1.58	4.99	8.83	6.77
313	-0.37	24.69	0.79	2.10	2.19	22.70	30.14	26.83	25.47	30.69
314	9.05	9.84	-0.14	0.52	-0.26	27.46	27.20	20.23	11.26	21.57
321	0.35	0.63	0.19	-1.35	0.20	2.17	1.46	5.97	8.83	2.62
322	0.16	0.36	0.02	-4.32	0.15	3.32	1.90	5.34	7.77	3.58
323	0.01	0.13	0.00	-2.48	0.15	0.26	0.25	9.32	7.14	1.87
324	-0.01	0.07	-0.00	-1.77	-0.00	0.09	0.16	0.12	11.58	0.12
331	0.32	0.53	0.04	-1.78	0.07	2.29	2.68	2.78	5.53	2.23
332	0.58	0.83	0.02	-1.07	0.26	1.81	1.45	2.84	10.64	2.44
341	2.57	0.44	0.32	0.11	3.81	3.07	0.67	6.17	7.75	6.44
342	4.49	0.29	0.11	1.02	0.70	4.49	0.38	0.14	5.71	1.80
351	2.51	2.15	0.38	1.02	2.03	6.10	6.20	6.93	6.49	6.29
352	0.48	0.54	4.22	-0.03	1.38	1.00	0.84	6.35	6.57	2.63
355	-0.05	0.94	0 30	1 08	0 31	0.00	3 15	1 53	12 10	1 67
356	2 39	1 34	1 21	1 16	0.24	4 87	2 20	12 08	11 57	2 71
361	9 00	0.01	0.00	-3 50	0.01	11 25	0.02	0.02	12 05	0.02
362	2 43	0.57	1 92	-0.25	1 12	3 93	0.02	3 90	8 56	4 34
369	1.46	0.84	2.90	3.70	2.68	4.11	1.00	5.28	9.37	7 19
371	0.09	0.32	0.34	0.97	0.13	4.74	0.62	6.28	5.98	0 68
381	0.39	0.93	0.79	1.64	1.17	0.54	2.05	4.02	9.85	5.16
382	0.99	0.82	1 34	-3.15	0.55	1 08	1 92	3 00	3 51	2 22
383	1.14	-2.10	4.74	-3.38	0.63	1.15	-1 29	7.27	4 87	2 54
384	0.23	0.26	0.94	0.90	0.92	0.67	1.50	7.12	8.85	6.09
385	1.09	-0.09	0.26	-2.96	-0.35	1.52	0.62	1.64	3.42	1.21
390	0.51	0.36	0.05	-4.80	0.07	1.00	1.98	2.86	2.25	3,60
Adjusted	0.54	-0.56	0.69	-1.93	0.77	2.25	0.94	6.37	6.26	5.18

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Change in Exports (with a 20% reduction in tariffs)

NOTE:

a. Less ISIC 313 and 314.

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Tab	le	5.	11

ISIC	Indonesia (%)	Malaysia (%)	Philippines (%)	Singapore (%)	Thailand (%)
Total	-0.03	-0.47	0.15	-1.78	0.07
311/312	-0.16	-0.37	0.01	-1.15	0.28
313	-0.22	0.63	0.00	-0.11	0.00
314	0.01	-0.02	-0.00	-0.01	-0.18
321	0.03	0.04	-0.01	-1.40	-0.02
322	0.12	0.28	0.02	-4.22	0.03
323	0.00	-0.08	0.00	-2.52	0.09
324	0.01	0.03	-0.00	-1.98	-0.00
331	0.28	0.36	0.03	-1.69	-0.45
332	-0.01	0.04	0.01	-1.07	0.03
341	0.22	-0.26	-0.00	-0.21	0.02
342	-0.03	-0.11	-0.01	0.16	-0.01
351	-0.22	-0.09	-0.11	0.69	-0.02
352	0.02	-0.09	0.05	-0.28	-0.02
355	-0.03	0.04	-0.00	0.14	0.01
356	-0.03	-0.11	0.06	0.04	-0.03
361	-0.00	0.01	0.00	-3.50	0.00
362	0.05	-0.25	0.08	-0.61	0.01
369	-0.32	-0.25	0.36	0.30	0.10
371	-0.06	-0.02	0.01	0.74	0.00
381	-0.15	-0.04	-0.02	0.33	0.04
382	0.17	0.49	0.62	-3.09	-0.07
383	0.13	-2.22	2.01	-3.41	0.15
384	-0.14	-0.01	0.05	0.65	-0.02
385	0.62	-0.10	0.19	-2.96	-0.35
390	0.42	0.14	0.05	-4.69	-0.05
Adjusted	-0.03	-0.50	0.18	-1.80	0.08

Change in Production (with a 20% reduction in tariffs)

NOTE:

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a. Less ISIC 313 and 314.

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Indonesia, Malaysia, and Singapore. The increase in production is less than .1 percent in the Philippines and Thailand, accounting for \$18 million and \$20 million, respectively. The decline in Indonesia is small, at less than -.03 percent or \$4 million, but more sizable in Malaysia (0.5 percent or \$81 million) and in Singapore (-1.8 percent \$347 million). It should be noted that the decrease in Indonesia is almost solely due to the decrease in production of food products (ISIC 311/312) and in Malaysia in food products and electrical equipment and machinery (ISIC 383).

In Indonesia, the percentage increase in imports from other ASEAN countries is largest in clothing (ISIC 322) and pottery and china (ISIC 363), where tariff levels average more than 100 percent. Paper and paper products (ISIC 341) and industrial chemicals (ISIC 351) are important export commodities to ASEAN and the world. Not surprisingly, these are commodities highlighted in Chapter III as Indonesia's most promising exports. It appears that reduction of protection in these commodities would indeed increase Indonesia's exports and that it is not just a supply-side constraint that keeps Indonesia's share of trade in these industries low. Other commodities such as printing and publishing (ISIC 342), plastic products (ISIC 356), and pottery and china (ISIC 361) also show large increasing export shares, but this appears to be due to zero or near zero exports in the initial period.

Imports from other ASEAN countries to Malaysia increase significantly in rubber products (ISIC 355), where its average import duties are exceedingly high. Surprisingly, the largest increase in import value terms is in electrical machinery (ISIC 383), and exports of

electrical machinery to the region and the world would fall. This result is in sharp contrast to what would be expected by the export specialization indices in Chapter III, but according to the model, the increase in imports and the decline in exports would be largely with Singapore which is a stronger producer of electrical machinery in the region. Malaysia's relatively high tariffs in the aggregated category of electrical equipment appears to be responsible for the result. A finer aggregation in this category may show a different result. Exports of industrial chemicals, plastic products, and rubber products (ISIC 355) would increase to ASEAN and the world. Table 3.21 in Appendix C indicates that Malaysia does indeed have large export specialization indices in a few industrial chemicals and rubber products, but the large increase in plastics may be due to the low initial values.

For the Fhilippines, more than any of the other countries, changes in shares can be misleading because of the large number of industries where trade with other ASEAN countries does not take place in the initial period. Industries where the increase in imports from other ASEAN countries have a non-zero trade creation effect include food products (ISIC 311/2), textiles (ISIC 321), plastic products (ISIC 356), non-metal products (ISIC 369), and machinery (ISIC 382). Exports would increase from a non-zero base in plastics products (ISIC 356) and chemicals (ISIC 351 and 352) where Chapter III shows that the Philippines has comparative advantage relative to other ASEAN countries. Furniture exports, another promising category according to Chapter III, would increase but not significantly.

Singerore, because of its dissimilarity with the other ASEAN countries, has a somewhat different pattern. The largest percentage increases in imports from the other ASEAN countries come in industrial chemicals, clothing, and furniture (ISIC 332). Exports would increase in furniture, chemicals, metal products (ISIC 381), and machinery.

Thailand's imports from the other ASEAN countries would increase significantly in a wide range of industries, but its exports do not increase in the light manufactures that it specializes in. The high trade creation and the relatively small increase in exports in industries that Thailand is known to be strongly competitive in may be due to its relatively high average tariff rates. As discussed in Chapter II, high tariff rates generate larger trade creation effects when lowered. Tariff levels of the ASEAN countries as discussed in Chapter III increase with export specialization and this peculiarity appears to affect the results of the model for Thailand in particular because of its higher than average tariff rates.

Overall, the results show that changes would occur in terms of the dispersion of industrial production in the region. For Indonesia, it is not surprising that the largest percentage increases in overall production would occur in labor-intensive and resource-intensive industries such as clothing (ISIC 322), wood products (ISIC 331), paper and paper products (ISIC 341), and other manufactures (ISIC 390). The model also projects that production in non-electrical machinery (ISIC 382), electrical machinery (ISIC 383), and professional goods (385) would also increase relatively significantly, but these latter industries are all industries where total production is small in the
initial period. Declining sectors include food products (ISIC 311/312), and non-metal products (ISIC 369). Production in Malaysia would increase by the largest percentage in relatively labor-intensive sectors including clothing (ISIC 322) and wood products (ISIC 331), and also in machinery (ISIC 383), with the largest declines in food products (ISIC 311/2), paper and paper products, glass and glass products, and electrical machinery. The Philippines would see the largest production increases in electrical machinery (ISIC 383) with no significantly declining industries. The changes predicted by the model for the Philippines are especially small because of the large number of industries where it conducts little or no trade with other ASEAN countries. Contrary to fears that Singapore's industries would overwhelm industrial production in other ASEAN countries, the results indicate that the only industry which would have a relatively large increase in production in Singapore is industrial chemicals (ISIC 351), iron and steel (ISIC 371), and transport equipment (ISIC 384), while significant declines in production would occur in several labor intensive industries such as textiles, clothing, and surprisingly in electrical and non-electrical machinery as well. Thailand, as could be expected, would increase production in food products (ISIC 311/312) and leather products (ISIC 323). Wood products and professional goods industries would decline.

A non-discriminatory 20 percent tariff reduction would have a much larger effect on total trade (Table 5.21a-e in Appendix E). Imports would increase in the order of 1 percent for Singapore to 8 percent in Thailand, while the increase in exports would range from 1 percent in

Singapore to nearly 5 percent in Indonesia. The determinants of higher import growth appear to be initially high tariff levels and higher percentage of imports with the rest of the world, while exports appear to be larger when the share of ASEAN in exports is larger and the share of exports in total production is lower. The trade balance would deteriorate in all cases with the exception of Indonesia, which would see a significant improvement of nearly 20 percent in its trade balance when all of the ASEAN countries reduce tariffs by 20 percent.

Including income growth into the model would completely eliminate declining production shares and sharply increase imports from both partners and non-partners even when income growth is assumed to be small. The importance of the income effect is clear when looking at the results with no change in tariff levels. With the assumption of 5 percent income growth in all countries and income elasticity close to one, total exports and exports to other ASEAN countries would increase by about 2 and 5 percent, respectively, in all of the countries except in Indonesia, where it would increase by less than 1 percent because of the small size of its exports in the initial period (Table 5.22 in Appendix E). Imports from other ASEAN countries and the rest of the world would increase by 5 percent and 3 percent respectively, in Indonesia, Malaysia, and Singapore, where domestic shares of total consumption are lower and ASEAN shares are larger in the initial period. Total consumption would increases by 3 to 4 percent in these three countries. For the Philippines and Thailand, imports from ASEAN countries would increase by 2 percent while imports from the rest of the world increases by less than 1 percent. Production would increase in

all countries by between 2 and 3.5 percent (Table 5.23 in Appendix E). Total consumption would increase by about 2 percent. The effect of income growth on the trade, production, and consumption can be summarized as follows: (1) its effect on exports and imports is larger when the initial shares are larger; and (2) its effect on total consumption and production is larger when domestic shares of total consumption and production are lower.

Combining a preferential tariff cut of 20 percent with 5 percent income growth, imports from ASEAN countries would triple in Indonesia, Malaysia, and Singapore, and more than triple in the other two countries as compared to the no tariff change case. Total imports and total production, however, would change only slightly from the no-tariff change case. It should be noted that because of the specification of the model, the differences in production and trade with and without preferences for the same income growth is exactly equal to the effect of trade preferences without income growth. No feedback effects are considered. The large effect of income growth relative to the effect of a 20 percent tariff reduction makes it clear that one must account for income growth in any ex-post model in order to differentiate the effect of the tariff change on imports from other factors.

Sensitivity analyses on the various elasticity and growth parameters indicate the following: (1) Assuming higher rates of income growth increases production growth by a comparable amount in percentage terms, except when the change in production is small. Therefore, as can be seen in Table 5.23 in Appendix E, a 60 percent decrease in income growth (from 0.05 to 0.02) generates a 60 percent decrease in production

growth in all countries except in Singapore. The effect on trade of a similar change in income is about half the size, but is less consistent across countries, with initial trade shares becoming an important determinant of the extent of changes. Changes in shares of non-partner countries increase by more than partner country shares.

(2) Changes in income elasticity also have a significant effect on the size of the changes in trade, production, and consumption. The magnitude of the effect was similar to that of changes in income growth. (3) Assuming differentials in income growth rates across countries changes the results somewhat. The assumption of a significantly higher growth rate in Singapore increases Singapore's imports from ASEAN countries sharply and decreases production in Singapore. Exports increase more in other ASEAN countries than they do in Singapore. The effect is amplified because of the relative sensitivity of Singapore to income changes due to its large trade shares. (4) Even very large changes in supply elasticities have little effect on trade growth. A change from supply elasticities of 0.5 to 2 causes a change in expected import growth of about 10 to 20 percent. An increase of gamma to 10 also causes a change in imports of about 10 to 20 percent over the situation where gamma was set at 2. But as would be expected, it has a more significant effect on production. But the effect is important only in Malaysia and Singapore where intra-ASEAN trade is large. With gamma equal to 10, the production is projected to increase in Singapore instead of decrease as it does with lower supply elasticity estimates. The increase in production is mainly absorbed in the domestic market though imports of other countries from Singapore do increase. The

assumption of infinite supply elasticities may somewhat overstate the growth of imports from Singapore. (5) Changing demand elasticities to 0.5 to 2 also has a negligible effect on trade and production, though the effect is larger when trade shares are larger. For the Philippines and Thailand, where the share of intra-ASEAN imports to total imports is less than 5 percent, the increase in demand elasticities has a slightly negative effect on intra-regional trade. Higher price elasticities also have a small positive effect on production. (6) As expected, the model is more sensitive to the changes in substitution elasticities. A 25 percent change in sigma results in about a 25 percent change in the absolute value of the expected change in imports. However, since the percentage changes predicted by the model simply became larger, and there is no reason to assume that substitution elasticities will differ widely among the countries, the conclusions regarding the changing trade and production patterns will hold. Estimates using substitution elasticities of two can be considered to be low end estimates and the general conclusions of the above discussion will still hold.

2. 50 percent tariff reductions

Following the agreement for tariff reductions decided at the third ASEAN summit, a 50 percent reduction over five years is considered for Malaysia, Singapore, and Thailand. Indonesia and the Philippines are given seven years to reduce their tariffs by 50 percent, and thus a slower rate of reduction is used for these two countries. After five years, their tariffs would have been reduced by approximately 40 percent.

With these reductions, imports from partners increase by a factor close to three (Tables 5.12a-e). As in the case of 20 percent tariff reductions, the increase in exports is larger in the resource-rich countries, averaging 3 to 4 percent (Table 5.13). Similar patterns prevail as to the size of the changes in the various countries and its effect on trade balances. In Singapore, the effect on exports is again mixed though with the larger tariff reductions exports decline overall despite sharp increases in exports to ASEAN.

Despite the larger tariff reductions, however, the effect on total production and consumption is still low, at less than 1 percent, except for the 2 percent decline in production in Singapore (Table 5.14). The industrial composition of changes in exports, imports, and production remains the same as in the 20 percent reduction, but the magnitude of the changes is amplified by a factor close to three. The differential rate of reduction for Indonesia and the Philippines appears to have little effect on the patterns found with a 20 percent reduction. Income growth and changes in the various parameters also affect the results in a symmetrical fashion.

3. Effect of a free trade area in ASEAN

A complete reduction of tariffs within the ASEAN countries is completed in the model over 10 periods. The magnitude of the resulting changes are of course larger, but similar in pattern to the above two scenarios. Imports from other ASEAN countries would increase by between 30 and 50 percent in the resource-rich countries, but by less than 1 percent in Singapore (Tables 5.15a-e). Exports to other ASEAN countries would also increase sharply in Indonesia, the Philippines, and Thailand,

# Table 5.12a

# Changes in Imports and Production for Domestic Consumption, Indonesia (with a 50% reduction in tariffs)

	>	In	ports		Decrease in
ISIC	Production domestic consumption (%)	ASEAN (%)	Rest of the world (%)	Increase in intra-ASEAN imports (US\$m)	imports from the rest of the world (US\$m)
Total	-0.44	18.08	-0.48	125.30	48.77
311/312	-1.65	30.80	-1.94	39.67	9.09
313	-0.82	57.62	1.34	0.93	-0.06
314	-0.12	39.24	1.22	0.06	-0.03
321	-0.03	23.33	-0.05	0.78	0.18
322	-0.03	53.09	0.00	0.04	-0.00
323	0.00	16.04	-0.04	0.01	0.00
324	0.02	31.21	0.12	0.10	-0.00
331	0.01	13.76	-0.21	0.08	0.00
332	-0.52	23.86	-1.51	0.34	0.10
341	-0.18	20.73	-0.35	1.49	1.16
342	-0.09	15.00	-0.35	0.26	- 0.06
351	-1.63	13.01	-0.25	16.84	4.62
352	-0.06	17.46	-0.28	1.12	0.47
355	-0.09	22.62	0.01	1.41	-0.01
356	-0.09	24.08	-0.28	0.63	0.05
361	-0.00	49.93	-0.02	0.00	0.00
362	-0.40	17.09	-0.73	0.95	0.20
369	-0.81	22.24	-0.69	5.14	0.59
371	-0.13	14.39	-0.32	4.25	3.02
381	-0.37	29.82	-0.96	9.20	4.77
382	-0.57	9.04	-0.41	10.71	10.95
383	-0.42	10.89	-0.39	8.84	3.61
384	-0.35	20.84	-0.60	21.28	8.88
385	-0.22	8.95	-0.50	1.05	0.97
390	-0.03	18.03	-0.47	0.14	0.14
Adjusted <sup>a</sup>	-0.52	17.98	-0.48	124.30	48.86

NOTE:

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a. Less ISIC 313 and 314.

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# Table 5.12b

# Changes in Imports and Production for Domestic Consumption, Malaysia (with a 50% reduction in tariffs)

		Im	ports		
ISIC	Production domestic consumption (%)	ASEAN (%)	Rest of the world (%)	Increase in intra-ASEAN imports (US\$m)	Decrease in imports from the rest of the world (US\$m)
Total	-1.15	18.66	-0.93	242.76	87.76
311/312	~ -1.74	19.69	-0.19	49.09	1.14
313	-2.36	105.40	1.33	4.93	-0.68
314	-0.16	116.16	0.83	1.24	-0.16
321	-0.79	27.21	-1.38	7.56	3.92
322	-3.00	29.14	-2.25	3.62	0.77
323	-0.56	23.94	-0.54	0.36	0.05
324	-0.40	30.82	-0.49	0.19	0.06
331	-0.29	18.07	-0.27	3.53	0.02
332	-0.25	32.38	-0.55	1.01	0.09
341	-0.79	16.77	-0.68	2.79	1.51
342	-0.32	14.50	-0.82	2.02	0.35
351	-1.19	15.82	-0.17	14.74	1.34
352	-0.51	12.68	-0.86	4.12	2.04
355	-0.00	53.49	0.02	1.25	-0.01
356	-0.96	33.92	-2.06	4.53	1.23
361	0.00	32.62	-0.02	0.00	0.01
362	-1.46	25.75	-2.20	2.08	0.98
369	-0.83	26.64	-1.46	8.82	1.65
371	-0.11	12.67	-0.26	2.49	1.82
381	-0.56	20.66	-0.91	8.03	3.50
382	-0.29	7.30	-0.32	5.28	5.63
383	-7.17	17.82	-2.15	93.39	50.37
384	-0.58	22.80	-0.86	19.91	10.65
385	-0.71	5.77	-0.26	0.77	0.70
390	-0.33	8.31	-0.71	1.00	0.78
Adjusted	-1.16	18.27	-0.95	236.59	88.60

NOTE:

a. Less ISIC 313 and 314.

# Table 5.12c

# Changes in Imports and Production for Domestic Consumption, Philippines (with a 50% reduction in tariffs)

		In	ports		Doorongo in
ISIC	Production domestic consumption (%)	ASEAN (%)	Rest of the world (%)	Increase in intra-ASEAN imports (US\$m)	imports from the rest of the world (US\$m)
Total	-0.11	16.42	-0.07	19.04	2.42
311/312	-0.20	26.02	-0.01	7.57	0.02
313	0.01	30.98	1.43	0.00	-0.77
314	0.00	37.96	1.26	0.00	-0.05
321	-0.08	25.27	-0.02	0.55	0.03
322	0.06	21.74	0.21	0.15	-0.01
323	0.00	21.13	-0.05	0.00	0.01
324	-0.01	27.39	0.04	0.00	-0.00
331	-0.00	16.70	-0.23	0.00	0.00
332	0.00	27.36	-0.09	0.00	0.00
341	-0.03	18.53	-0.13	0.18	0.13
342	-0.03	16.68	-0.12	0.07	0.02
351	-0.53	11.96	-0.11	3.49	0.69
352	-0.03	15.35	-0.15	0.46	0.24
355	-0.01	17.74	0.03	0.30	-0.01
356	-0.10	23.55	-0.15	0.32	0.02
361	-0.00	27.95	-0.02	0.00	0.00
362	-0.02	18.53	-0.06	0.05	0.01
369	-0.04	20.29	-0.16	0.11	0.03
371	-0.01	13.71	-0.04	0.19	0.11
381	-0.15	19.87	-0.29	1.05	0.43
382	0.05	8.25	-0.26	1.12	5.63
383	-0.31	13.27	-0.02	2.60	0.07
384	-0.04	15.41	0.05	0.66	-0.15
385	-0.25	7.58	-0.22	0.17	0.15
390	0.43	20.78	-0.01	0.00	0.00
Adjusted <sup>a</sup>	-0.13	16.42	-0.10	19.04	3.24

NOTE:

a. Less ISIC 313 and 314.

# Table 5.12d

# Changes in Imports and Production for Domestic Consumption, Singapore (with a 50% reduction in tariffs)

		Im	ports		Decrease in
ISIC	Production domestic consumption (%)	ASEAN (%)	Rest of the world (%)	Increase in intra-ASEAN imports (US\$m)	imports from the rest of the world (US\$m)
Total	-3.31	1.05	0.78	26.62	-115.51
311/312	-3.35	0.24	0.92	1.66	-6.83
313	-6.14	127.24	-3.82	12.18	3.43
314	-1.96	108.15	-2.49	2.99	1.89
321	-4.16	0.75	0.41	0.87	-3.50
322	-9.60	4.82	1.57	5.52	-2.83
323	-6.93	0.65	0.27	0.04	-0.19
324	-5.76	0.40	0.34	0.03	-0.23
331	-3.05	1.42	1.33	3.12	-0.28
332	-2.65	3.69	1.29	0.43	-0.94
341	-1.86	0.46	<b>0.42</b>	0.09	-1.04
342	-0.09	0.67	0.25	0.04	-0.21
351	-1.63	15.48	-0.29	7.47	2.80
352	-1.73	0.75	0.47	0.52	-1.86
355	-0.49	0.07	0.11	0.01	-0.13
356	-1.59	2.91	1.20	0.58	-1.53
361	-8.76	0.06	0.04	0.00	-0.04
362	-5.05	1.03	0.52	0.19	-0.51
369	-0.85	1.39	0.97	0.39	-2.99
371	-0.48	0.14	0.03	0.02	-0.28
381	-0.86	0.98	0.61	0.36	-3.61
382	-6.17	2.40	1.30	4.49	-34.96
383	-8.47	-1.90	1.55	-15.40	-48.77
384	-0.99	1.57	0.16	0.35	-3.13
385	-6.20	0.50	0.85	0.08	-5.70
390	-8.76	1.94	1.41	0.62	-4.08
Adjusted	-3.27	0.45	0.82	11.45	-120.83

NOTE:

a. Less ISIC 313 and 314.

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### Table 5.12e

# Changes in Imports and Production for Domestic Consumption, Thailand (with a 50% reduction in tariffs)

		In	ports		Deereese in
ISIC	Production domestic consumption (%)	ASEAN (%)	Rest of the world (%)	Increase in intra-ASEAN imports (US\$m)	imports from the rest of the world (US\$m)
Total	-0.16	29.65	-0.21	87.31	13.64
311/312	-0.10	61.59	0.21	23.90	-0.51
313	0.01	69.53	1.43	0.00	-0.60
314	-0.58	31.15	1.07	0.25	-0.04
321	-0.16	49.22	0.07	2.68	-0.16
322	-0.03	61.80	0.04	0.16	-0.00
323	-0.00	49.71	-0.05	0.00	0.00
324	0.00	50.02	0.05	0.00	-0.00
331	-1.50	23.99	-1.79	15.09	0.11
332	-0.00	44.11	-0.09	0.00	0.01
341	-0.07	32.87	-0.26	1.77	0.42
342	-0.06	20.25	-0.21	0.24	0.04
351	-0.61	28.21	-0.39	10.50	4.29
352	-0.16	37.05	-0.43	4.07	1.08
355	-0.01	40.96	0.05	0.87	-0.03
356	-0.22	53.39	-0.27	1.50	0.11
361	-0.00	65.91	-0.02	0.00	0.00
362	-0.16	42.03	-0.17	0.85	0.05
369	-0.00	40.50	-0.04	0.15	0.01
371	-0.01	19.03	-0.02	0.18	0.11
381	-0.18	29.73	-0.31	2.83	0.80
382	-0.39	16.54	-0.27	4.93	3.46
383	-0.54	19.82	-0.60	14.53 ,	4.83
384	-0.05	29.15	0.17	1.58	-1.30
385	-0.83	21.78	-0.12	0.93	0.20
390	-0.17	33.38	-0.47	0.29	0.76
Adjusted <sup>a</sup>	-0.15	29.64	-0.23	87.06	14.27

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NOTE:

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a. Less ISIC 313 and 314.

			Total expo	rts			E	xports to A	ASEAN	
ISIC	Indo- nesia (%)	Malay- sia (%)	Philip- pines (%)	Singa- pore (%)	Thai- land (%)	Indo- nesia (%)	Malay- sia (%)	Philip- pines (X)	Singa- pore (X)	Thai- land (%)
Total	1.41	-0.90	1.88	-4.00	1.97	6.49	3.42	17.47	16.59	13.23
311/312	1.06	-0.29	0.34	-2.46	2.85	9.28	4.46	12.86	24.87	17.22
313	-1,38	103.82	3.09	7.53	9.39	84.32	127.18	107.13	92.86	131.61
314	36.43	39.31	-0.57	1.86	-0.97	110.51	108.71	72.60	32.43	74.11
321	1.04	1.86	0.51	-3.30	0.54	6.49	4.24	16.78	24.64	7.31
322	0.44	0.96	0.08	-10,60	0.41	9.13	4.87	15.45	22.08	9,95
323	0.02	0.32	0.01	-6.31	0.44	0.67	0.61	26.61	19.76	5.37
324	-0.01	0.21	-0.00	-4.47	-0.00	0.24	0.44	0.30	30.96	0.30
331	0.86	1.50	0.08	-4.01	0.26	6.22	7.40	7.56	15.57	6.09
332	1.31	2.14	0.04	-2.55	0.70	4.46	3.74	6.78	29.00	6.65
341	6.88	1.29	0.88	0.74	8.79	8.24	1.88	16.97	21.18	14.86
342	12.13	0.80	0.26	2.69	1.91	12.13	1.03	0.34	14.97	4.88
351	6.09	5.40	0.91	2.47	5.09	15.06	15.55	16.97	15.87	15.75
352	1.24	1.52	11.76	0.25	3,60	2.59	2.34	17.74	17.78	6.81
355	-0.12	2.39	0.66	2.98	0.90	0.01	7.69	3.40	33.24	4.91
356	5.41	3.84	3.84	3.58	0.67	11.05	6.25	38.39	33.49	7.47
361	27.09	0.03	0.00	-8.81	0.01	33.86	0.06	0.06	35.09	0.06
362	6.87	1.79	5.19	-0.33	2.81	11.27	2.61	10.53	22.35	10.88
369	4.17	2.10	6.55	9.77	7.24	11.75	2.48	11.91	24.37	19.44
371	0.18	0.76	0.77	2.17	0.31	11.91	1.45	14.33	13.71	1.59
381	0.89	2,44	2.18	4.13	3.03	1.26	5.32	11.34	24.79	13.28
382	2.18	1.91	3.44	-6.69	1.38	2.39	4.41	7.68	8.14	5.30
383	2.59	-4.34	13.20	-7.15	1.68	2.62	-2.68	20.27	13.62	6.34
384	0.50	0.69	2.57	2.19	2.29	1.59	3.57	19.51	21.72	15.10
385	2.85	-0.21	0.68	-5.92	-0.68	3.97	1.32	4.28	8.79	3.21
390	1.06	1.08	0.10	-9.57	0.13	2.09	5.30	7.35	7.79	9.45
Adjusted	1.28	-1.06	1.88	-4.07	1.97	5.82	2.76	17.44	16.27	13.21

Change in Exports (with a 50% reduction in tariffs)

Table 5.13

NOTE:

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a. Less ISIC 313 and 314.

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# Table 5.14

ISIC	Indonesia (%)	Malaysia (%)	Philippines (%)	Singapore (%)	Thailand (%)
Total	-0.07	-1.03	0.43	-3.82	0.16
311/312	-0.51	-0.98	0.02	-2.64	0.70
313	-0.82	2.74	0.02	-0.88	0.02
314	0.06	-0.08	-0.00	-0.13	-0.58
321	0.09	0.12	-0.04	-3.47	-0.08
322	0.35	0.72	0.08	-10.40	0.07
323	0.01	-0.25	0.00	-6.44	0.26
324	0.02	0.09	-0.00	-5.06	~0.00
331	0.76	1.03	0.06	-3.82	-1.22
332	-0.00	0.07	0.04	-2.59	0.09
341	0.59	-0.61	0.00	-0.16	0.04
342	-0.06	-0.30	-0.02	0.44	-0.03
351	-0.59	-0.28	-0.23	1.65	-0.09
352	0.07	-0.23	0.14	-0.45	-0.08
355	-0.09	0.09	-0.01	0.39	0.02
356	-0.07	-0.34	0.20	0.28	-0.10
361	-0.00	0.01	0.00	-8.80	0.00
362	0.24	-0.65	0.22	-1.27	0.00
369	-0.69	-0.72	0.82	0.90	0.28
371	-0.13	-0.07	0.03	1.64	0.00
381	-0.36	-0.14	-0.02	0.82	0.09
382	0.33	1.11	1.57	-6.58	-0.17
383	0.25	-4.71	5.59	-7.29	0.33
384	-0.34	-0.04	0.15	1.55	-0.04
385	1.63	-0.23	0.50	-5.97	-0.78
390	0.87	0.37	0.10	-9.41	-0.15
Adjusted <sup>a</sup>	-0.09	-1.11	0.49	-3.86	0.18

# Change in Production (with a 50% reduction in tariffs)

NOTE:

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a. Less ISIC 313 and 314.

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# Table 5.15a

# Changes in Imports and Production for Domestic Consumption, Indonesia (with free trade among ASEAN countries)

		Im	ports		Deemeese de
ISIC	Production domestic consumption (%)	ASEAN (%)	Rest of the world (%)	Increase in intra-ASEAN imports (US\$m)	Decrease in imports from the rest of the world (US\$m)
Total	-1.42	61.68	-1.68	427.57	170.20
311/312	-6.08	112.89	-7.81	145.43	33.96
313	-4.22	320.66	8.83	5.19	-0.43
314	-0.44	170.96	6.35	0.26	-0.16
321	-0.12	82.78	-0.16	2.75	0.53
322	-0.16	360.62	-0.19	0.25	0.01
323	0.01	58.21	-0.07	0.03	0.00
324	0.08	131.54	0.44	0.43	-0.02
331	0.04	44.12	-0.48	0.26	0.01
332	-1.91	84.91	-5.39	1.22	0.34
341	-0.55	68.37	-1.17	4.90	3.82
342	-0.27	45.83	-1.07	0.78	0.18
351	-4.08	38.86	-1.03	50.30	18.76
352	-0.21	56.31	-0.82	3.61	1.38
355	-0.24	75.93	0.08	4.73	-0.07
356	-0.28	85.68	-0.83	2.24	0.16
361	-0.00	231.11	-0.04	0.00	0.00
362	-1.31	57.45	-2.53	3.21	0.67
369	-2.71	74.71	-2.47	17.25	2.05
371	-0.40	43.82	-0.99	12.95	9.25
381	-1.32	111.16	-3.71	34.27	17.82
382	-1.57	28.50	-1.27	33.76	33.45
383	-1.18	36.40	-1.60	29.54	14.42
384	-1.08	69.04	-2.11	70.51	30.61
385	-0.68	27.54	-1.56	3.22	2.99
390	-0.21	61.93	-1.54	0.48	0.44
Adjusted	-1.62	61.05	-1.69	422.12	170.78

NOTE:

a. Less ISIC 313 and 314.

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# Table 5.15b

# Changes in Imports and Production for Domestic Consumption, Malaysia (with free trade among ASEAN countries)

Imports							
ISIC	Production domestic consumption (%)	ASEAN (%)	Rest of the world (%)	Increase in intra-ASEAN imports (US\$m)	imports from the rest of the world (US\$m)		
Total	-3.06	44.18	-1.93	574.66	181.10		
311/312	-4.67	46.02	0.33	114.72	-2.05		
313	-14.89	542.58	8.81	25.37	-4.93		
314	-0.90	677.80	4.19	7.22	-0.84		
321	-2.07	67.01	-3.41	18.62	9.39		
322	-9.01	72.82	-5.71	9.04	1.85		
323	-1.44	58.09	-1.30	0.88	0.12		
324	-1.03	79.27	-1.26	0.48	0.14		
331	-0.82	40.95	-0.63	8.01	0.05		
332	-0.65	82.91	-1.23	2.60	0.20		
341	-2.17	37.88	-1.38	6.30	3.03		
342	-0,73	32.23	-1.81	4.50	0.76		
351	-2.83	35.29	-0.32	32.87	2.42		
352	-1.19	27.57	-1.82	8.95	· 4.25		
355	-0.01	164.36	0.07	3.86	-0.03		
356	-2.61	88.20	-5.45	11.79	3.09		
361	0.00	7.91	-0.03	0.00	0.01		
362	-3,95	62.82	-5.37	5.08	2.26		
369	-2.13	64.73	-3.52	21.44	3.84		
371	-0.24	27.83	-0.58	5.47	3.98		
381	-1.37	48.19	-2.11	18.72	7.96		
382	-0.71	12.77	-0.60	9.24	10.40		
383	-22.00	40.03	-4.81	209.76	107.83		
384	-1.41	54.02	-2.07	47.19	25.05		
385	-1.59	8.72	-0.41	1.16	1.09		
390	-0.51	11.62	-1.15	1.40	1.23		
Adjusted <sup>a</sup>	-2.91	41.86	-2.00	542.07	186.87		

NOTE:

a. Less ISIC 313 and 314.

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# Table 5.15c

## Changes in Imports and Production for Domestic Consumption, Philippines (with free trade among ASEAN countries)

		In	ports		
ISIC	Production domestic consumption (%)	ASEAN (X)	Rest of the world (%)	Increase in intra-ASEAN imports (US\$m)	Decrease in imports from the rest of the world (US\$m)
Total	-0.32	54.10	-0.16	62.70	11.75
311/312	-0.63	91.53	0.15	26.64	-0.39
313	0.04	36.89	9.18	0.00	-5.46
314	0.00	127.61	6.49	0.00	-0.27
321	-0.23	78.67	-0.09	1.87	0.16
322	0.30	80.39	0.69	0.54	-0.03
323	0.01	6.83	-0.09	0.00	0.01
324	-0.02	9.16	0.11	0.00	-0.00
331	-0.00	5.17	-0.55	0.00	0.01
332	0.00	9.06	-0.06	0.00	0.00
341	-0.11	59.02	-0.31	0.56	0.32
342	-0.08	52.09	-0.35	0.23	0.07
351	-1.47	35.89	-0.41	10.47	2.69
352	-0.09	47.91	-0.39	1.45	0.60
355	-0.03	56.06	0.11	0.93	-0.03
356	-0.31	80.84	-0.35	1.08	0.04
361	-0.00	9.54	-0.04	0.00	0.00
362	-0.06	62.65	-0.12	0.16	0.01
369	-0.15	66.66	-0.50	0.35	0.09
371	-0.03	41.52	-0.10	0.57	0.32
381	-0.44	64.89	-0.98	3.44	1.40
382	0.06	25.72	-0.74	3.50	10.40
383	-0.84	42.54	-0.37	8.35	1.61
384	-0.11	48.03	0.08	2.05	-0.25
385	-0.63	22.63	-0.68	0.50	0.46
390	0.13	6.54	-0.04	0.00	0.01
Adjusted	-0.38	54.10	-0.34	62.70	11.28

NOTE:

a. Less ISIC 313 and 314.

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### Table 5.15d

# Changes in Imports and Production for Domestic Consumption, Singapore (with free trade among ASEAN countries)

		In	ports		Deemeene in
ISIC	Production domestic consumption (%)	ASEAN (%)	Rest of the world (%)	Increase in intra-ASEAN imports (US\$m)	imports from the rest of the world (US\$m)
Total	-8.19	3.83	1.79	97.23	-265.77
311/312	-8.34	-0.05	2,58	-0.37	-19.67
313	-52.34	774.50	-31.52	74.12	21.51
314	-11.40	550.95	-14.26	15.21	9.50
321	-10.07	1.59	0.90	1.84	-7.78
322	-28.12	9.57	3.77	10.96	-7.09
323	-17.15	1.31	0.57	0.07	-0.41
324	-14.40	0.89	0.78	0.06	-0.52
331	-7.62	3.29	3.07	7.23	-0.67
332	-6.70	8.17	3.11	0.95	-2.35
341	-4.71	0.97	1.01	0.19	-2.54
342	-0.21	1.48	0.54	0.08	-0.47
351	-4.00	34.56	-0.61	16.67	5.78
352	-4.21	1.73	1.10	1.20	-4.37
355	-1.14	0.13	0.25	0.02	-0.29
356	-3.73	6.61	2.66	1.32	-3.48
361	-22.95	0.12	0.09	0.01	-0.08
362	-12.81	2.24	1.18	0.41	-1.15
369	-2.16	3.35	2.36	0.93	-7.46
371	-1.02	0.29	0.07	0.05	-0.58
381	-1.95	2.17	1.33	0.80	-8,04
382	-17.27	5.26	3.04	9.81	-84.25
383	-23.98	-5.78	3.65	-46.86	-119.53
384	-2.24	3.30	0.36	0.73	-7.15
385	-18.02	1.14	2.05	0.19	-14.04
390	-29.73	5.07	3.54	1.61	-10.65
Adjusted	-7.62	0.31	2.02	7.90	-296.77

NOTE:

a. Less ISIC 313 and 314.

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# Table 5.15e

# Changes in Imports and Production for Domestic Consumption, Thailand (with free trade among ASEAN countries)

		In	ports		Dooroogo in
ISIC	Production domestic consumption (%)	ASEAN (%)	Rest of the world (%)	Increase in intra-ASEAN imports (US\$m)	imports from the rest of the world (US\$m)
Total	-0.44	79.25	-0.41	233.37	26.30
311/312	-0.28	204.54	0.97	79.36	-2.39
313	0.04	136.41	9.17	0.00	-4.21
314	-1.87	87.52	5.94	0.70	-0.21
321	-0.48	145.29	0.25	7.91	-0.58
322	-0.10	201.43	0.04	0.52	-0.00
323	-0.00	98.04	-0.11	0.00	0.00
324	0.00	125.96	0.14	0.00	-0.00
331	-3.80	57.18	-4.30	35.97	0.26
332	-0.00	94.76	-0.06	0.00	0.00
341	-0.20	84.30	-0.63	4.55	1.02
342	-0.13	47.11	-0.49	0.56	0.09
351	-1.53	69.60	-0.98	25.90	10.63
352	-0.45	98.79	-1.09	10.85	2.70
355	-0.04	112.78	0.13	2.40	-0.10
356	-0.71	164.99	-0.70	4.65	0.28
361	-0.00	137.09	-0.04	0.00	0.01
362	-0.45	118.76	-0.41	2.41	0.11
369	-0.01	110.94	-0.08	0.40	0.02
371	-0.02	43.91	-0.04	0.43	0.24
381	-0.45	74.70	-0.76	7.11	1.93
382	-1.12	35.87	-0.50	10.68	6.38
383	-1.25	43.89	-1.40	32.16	11.09
384	-0.17	72.94	0.42	3.96	-3.20
385	-2.46	49.13	-0.06	2.10	0.10
390	-0.42	85.39	-1.32	0.74	2.11
Adjusted <sup>®</sup>	-0.41	79.23	-0.49	232.66	30.71

NOTE:

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a. Less ISIC 313 and 314.

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giving rise to a 4 to 5 percent increase in total exports (Table 5.16). Production will increase by about 1 percent in the Philippines and Thailand, but decrease in the other countries (Table 5.17). Again the decline is concentrated in selected industries.

### IV. The Potential Effect of ASEAN PTA

Although ASEAN PTA up until now has had little discernable impact on trade and growth in the region, it is clear that more encompassing preferential reductions would increase welfare and efficiency in the region. Consumption would increase in most of the countries, but even with complete free trade the changes are small. The industrial distribution of production will change, but the fear of any one country dominating the region is unfounded. Production will decline overall in Indonesia, Malaysia, and Singapore, but increase slightly in the other two countries. The small decline in Indonesia, however, is almost entirely due to the decrease in préduction of food products. The model is a static model and is not able to consider the effect of the release of unproductive resources into more productive sectors and therefore will overstate a negative production effect. Further, the increase in consumption due to the lower prices faced by consumers in this industry is significant.

For Malaysia, the decline is in food products and electrical machinery. In the case of electrical machinery, Malaysia's high average tariffs for the category as a whole and its large imports due to the intra-industry trade in this sector are responsible for the result. A finer disaggregation may be necessary to capture the true picture in

Table 5.16
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		Change	in E	xports	
(with	free	trade	among	ASEAN	countries)

	· ·	1	Total expo	rts	Exports to ASEAN						
ISIC	Indo- nesia (%)	Malay- sia (%)	Philip- pines (%)	Singa- pore (%)	Thai- land (%)	Indo- nesia (X)	Malay- sia (%)	Philip- pines (X)	Singa- pore (%)	Thai- land (%)	
Total	4.29	-2.19	4.74	-8.64	5.49	18.36	11.51	44.63	44.15	37.78	
311/312	3.76	-0.60	1,02	-4.87	8.20	24.76	14.60	39.92	73.22	50.60	
313	-7.97	631.33	15.37	39.42	62.09	339.76	773.18	564.58	484.12	870.55	
314	194.04	202.48	-3.06	8.25	-4.28	588.40	559,85	293.17	100.74	322.16	
321	2.81	5.08	1.52	-6.81	1.34	17.36	12.07	47.82	62.93	18.97	
322	1.12	0.80	0.15	-24.02	0.98	22.22	9.56	39.22	54.05	24.37	
323	0.03	0.55	0.01	-13.09	1.08	1.38	1.15	35.44	47.70	13.11	
324	-0.13	0.51	-0.00	-8.48	-0.01	0.42	1.01	0.65	97.54	0.64	
331	2.04	3.43	0.20	-9.22	0.39	14.78	17.50	17.72	34.57	14.06	
332	4.23	4.74	0.09	-5.33	1.72	11.26	8.25	19.91	81.57	16.49	
341	16.50	3.10	1.99	2.24	26.85	19.70	4.70	39.02	54.29	45.43	
342	27.40	1.76	0.64	6.36	4.28	27.40	2.29	0.82	35.09	10.92	
351	15.68	13,52	2.47	6.55	12.71	38.04	38.80	45.39	41.21	39.41	
352	3.10	3.76	30.33	1.09	8.59	6.37	5.94	45.74	45.35	16.25	
355	-0.36	7.48	2.21	9.68	2.81	-0.07	24.04	11.33	102.91	15.24	
356	17.79	10.62	11.31	11.28	1.78	36.22	17.46	112.45	92.96	20.12	
361	31.43	0.07	0.01	-18.77	0.03	39.29	0.12	0.12	70.81	0.12	
362	17.97	4.28	13.85	1.60	8.10	29.21	6.53	28.06	62.17	31.38	
369	10.38	5.60	21.55	27.23	19.40	29.13	6.70	39.16	67.17	52.07	
371	0.57	2.03	2.15	6.19	0.83	2.98	3.94	39.85	37.38	4.26	
81	3.02	7.00	5.43	13.54	8.40	3.83	15.61	27.40	75.21	36.91	
82	4.99	4.77	8,36	-15.50	3.14	5.48	11.15	18.62	20.88	12.87	
83	6.83	-12.37	32.37	-16.43	4.22	6.90	-8,16	49.70	30.18	16.80	
84	1.61	1.76	6.82	6.80	6.45	3.78	9,90	51.65	61.84	42.58	
85	7.31	-0.59	1.68	-14.48	-2.35	10.16	3.46	10.40	20.94	6.39	
90	2.85	2.36	0.28	-24.82	0.32	5.56	13.28	17.73	11.37	22.54	
djusted	3,56	-3.16	4.74	-8.90	5.47	14.71	7.48	44.46	42.30	37.63	

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NOTE: a. Less ISIC 313 and 314.

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# Table 5.17

ISIC	Indonesia (%)	Malaysia (%)	Philippines (%)	Singapore (%)	Theiland (%)		
Total	-0.29	-2.67	1.05	-8.52	0.44		
311/312	-1.73	-2.43	0.03	-5.43	2.02		
313	-4.06	17.95	0.10	-5.97	0.13		
314	0.47	-0.51	-0.01	-1.39	-1.84		
321	0.23	0.42	-0.12	-7.27	-0.25		
322	0.86	0.24	0.16	-23.61	0.15		
323	0.01	-0.73	0.01	-13,40	0.63		
324	0.06	0.20	-0.01	-10.36	-0.00		
331	1.80	2.32	0.15	-8.79	-3.00		
332	-0.14	0.08	0.09	-5.78	0.22		
341	1.30	-1.66	-0.03	-0.11	0.15		
342	-0.21	-0.68	-0.08	1.05	-0.08		
351	-1.29	-0.49	-0.64	4.47	-0.22		
352	0.13	-0.50	0.35	-0.71	-0.26		
355	-0.24	0.29	-0.01	1.63	0.07		
356	-0.23	-0.85	0.61	1.79	-0.38		
361	-0.00	0.03	0.00	-18.75	0.00		
362	0.41	-1.80	0.58	-0.99	0.01		
369	-2.33	-1.79	2.70	2.73	0.74		
371	-0.39	-0.14	0.07	4.75	0.01		
381	-1.29	-0.17	-0.13	3.30	0.29		
382	0.59	2.78	3.79	-15.35	-0.57		
383	0.60	-13.11	13.68	-16.73	0.90		
384	-1.03	-0.05	0.40	5.00	-0.12		
385	4.14	-0.64	1.24	-14.63	-2.39		
390	2.31	0.92	0.28	-24.44	-0.37		
Adjusted <sup>a</sup>	-0.38	-3.02	1.19	-8.58	0.52		

# Change in Production (with free trade among ASEAN countries)

NOTE:

a. Less ISIC 313 and 314.

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this industry. Singapore's production declines in several labor-intensive industries. The declines may be overstated because of the problem of indentifying re-exports in Singapore's trade which understates production for the domestic market. Although adjustments were made to correct for this problem, it appears that the bias could not be completely negated.

Intra-ASEAN trade imports would rise sharply and slightly offset declining imports from the rest of the world. Exports to other ASEAN countries would expand by less than imports from ASEAN countries, and the overall trade balance will worsen slightly in Indonesia, Malaysia, and Singapore. Including economic growth or larger preferences in the analysis amplifies the benefits for most countries.

### NOTES

- 1. See Table 5.18 in Appendix E for a list of 3-digit ISIC categories.
- 2. In deriving import-demand elasticities for Canada, Balassa (1967, p. 320) divides the U.S. import-demand elasticities by the U.S consumption-import ratio and multiplies the results by the comparable ratio for Canada. The procedure assumes that domestic demand and supply elasticities are identical between countries. The underlying formula for the above is:

nm = n C/M + e P/M

where C = domestic consumption; P = domestic production; n = domestic elasticity of demand; e = domestic elasticity of supply; nm = import-demand elasticity.

- 3. Testing a similar type of model, Clague (1971) finds that estimates are insensitive to all parameters except for the elasticity of substitution.
- 4. Deardorff and Stern (1985) find that doubling all supply elasticities has a negligible effect.
- 5. Trade diversion in the welfare sense represents a transfer of tariff revenue from the importing country to partner countries. Simple compensatory schemes can be set up to adjust for this.

#### CHAPTER VI

### CONCLUSIONS

#### I. Introduction

The motivation for this study has been the belief that closer ASEAN integration can improve welfare in the region. The ASEAN countries showed their resolve to expand economic cooperation at the Third ASEAN Summit held in 1987 but progress in implementing the decisions has been slow. This present slow progress could be accelerated if careful analysis was done to reduce fears and uncertainties and to highlight industries where expansion is most likely.

The common criticism levied against integration efforts among developing countries is that they are too similar for intra-regional trade to expand significantly. On the other hand, it is commonly argued that the wide disparities among ASEAN countries will be a major factor inhibiting a more ambitious integration effort. In this dissertation, I argue that opportunities for trade expansion in ASEAN do exist. The similarity in export structure is largely in primary commodities where intra-regional export expansion is unlikely to increase significantly. But there are large opportunities for trade expansion in manufactured products and to a lesser degree in agriculture and food products. Considerable specialization has been taking place in the region and there is a wide latitude for it to continue. The final goal of the dissertation is to show that with the present resolve of the ASEAN countries to significantly expand trade, ASEAN Preferential Trading

Arrangements (PTA) can have an important impact on trade, production, and growth in the region.

In attempting to address the above issues, the objectives of the study can be divided into three areas. First, the progress made up to the present in ASEAN trade cooperation is assessed. The goal was not -only to present a historical examination of ASEAN's accomplishments but to apply trade and economic integration theory to explain the progress made by ASEAN and to critically examine the problems of the PTA. Second, the study examined the prospects for future trade expansion by examining the structure of comparative advantage in the region and the possible effects of economies of scale and intra-industry trade to identify areas where tariff reductions may produce the largest gains. The identified industries may be ideal candidates for ASEAN's industrial cooperation projects since industrial cooperation is intimately linked with cooperation in trade. Third, the study estimated the effects of the present PTA and of an improved ASEAN PTA. A clearer understanding of the possible effects of integration could speed up the implementation of the agreements reached at the Third ASEAN Summit.

The results of the study show that efficiency and welfare gains will accrue to ASEAN countries if intra-regional trade is liberalized, partially or completely. Importantly, the negative effect on the rest of the world from trade diversion is less than the increase in welfare of the ASEAN countries overall, and therefore, progression in ASEAN trade cooperation increases world welfare as well. The existing structure of protection in all of the resource-rich countries has limited intra-ASEAN trade in the past and the preferences offered by the

ASEAN countries have done little to correct the problem. Systematic removal or lowering of these barriers can dramatically increase intra-ASEAN trade, with a limited, but most often positive, impact on production and total trade. Gains from economies of scale and intra-industry trade also accrue to ASEAN countries especially in intermediate and capital goods as they move towards closer economic integration.

#### II. Summary of Findings

As an organization, ASEAN has had many successes, but it has had limited value in terms of economic cooperation. Although intra-ASEAN trade increased rapidly as a share of total trade in the mid-1970s after the PTA was established, the sharp drop in the share of intra-ASEAN trade after 1983 to less than 18 percent presently, made it clear that other factors were involved. In particular, studies have shown that the changing shares were largely due to the fluctuations in petroleum prices.

Often simple trade shares are used to examine the effect of the PTA but the above example shows that this is very misleading. The ineffectiveness of the ASEAN PTA is implied by studies which have found that preferential trade accounts for only a small share of total intra-regional trade. An actual measure of the impact of the PTA was done in this disseration using two different methodologies, the import growth and the constant market shres approach. The results, however, are inconclusive. Nonetheless, it appears that intra-ASEAN trade increased in a number of industries more than would be expected given

income growth and the overall trade liberalization undertaken by the countries. Because of the low level of preferences in most cases, however, it is unlikely that the PTA was responsible for the increases in most cases. There are, however, a few industries, in particular in the Philippines and Malaysia, where increase in imports may have been due to the PTA.

The disappointing economic impact of the PTA can be largely attributed to various implementation problems and problems inherent in the PTA itself. The large exclusion lists, low levels of tariff reductions, and non-tariff barriers constrained the expansion of intra-ASEAN trade. In addition, the preferences were offered on goods that had little practical value in terms of effective trade creation. Many of the commodities selected for preferential treatment were not traded or only lightly traded within the region. Findings of this disseration showed that tariff preferences are not generally given in industries where other countries have comparative advantage and, in fact, tariff rates tend to be higher in commodities of interest to other ASEAN countries. There is a strong positive correlation between comparative advantage and tariffs in all of the ASEAN countries except for Singapore. This correlation means that tariffs tend to be higher in industries where export specialization occurs.<sup>1</sup> At the same time, preferences offered to other ASEAN countries are closely correlated with export specialization indices. In other words, these countries are likely to offer higher preferences for items that they themselves export. Although the third ASEAN summit addresses some of these

problems, it is as yet uncertain how effective the countries will be in actually implementing the scheme.

It is clear from the above that the slowness of progress in economic cooperation in the past is because the member countries have chosen to take a cautious approach that does not allow ASEAN priorities to supercede national ones. This cautious approach, in turn, stems from fears and concerns regarding the effects of integration and their distribution, primarily arising from the differing characteristics of the economies of individual members. Many questions about the probable effects of greater economic cooperation need to be analyzed before ASEAN integration can take place before ASEAN can move toward closer economic cooperation.

Even assuming that the political will is present, the effect of an expanded PTA is uncertain. Economic theory tells us that by lowering or removing trade barriers among themselves, countries can accrue economic gains arising from increased efficiency, attaining economies of scale, and other integration-induced changes affecting the quantity or quality of factor inputs, such as increased capital inflows. The reduction of trade barriers also permits lower prices for consumers, wider consumer choice among goods, and hence gains in the economic welfare of member countries. At the same time, economic theory also cautions that integration may lead to a welfare loss as higher priced goods from member countries replace lower priced goods from non-members. The net effect of regional integration in a particular case will depend on a number of factors that are examined in the disseration.

Chapter II presents theoretical expectations of economic integration and highlights initial conditions within and among the participating countries that may determine the magnitude of economic gains. High tariffs, the large relative size of intra-regional trade, and the large share of domestic production in total consumption in the initial period will increase the propensity of a country to experience more trade creation and less trade diversion. In addition, the closer the final solution is to world prices the more likely it is that a country will experience welfare gain. Moreover, a group of competitive economies will reap large initial gains, but trade creation in the longer term will require complementarity. Finally, gains from intra-industry trade and economies of scale should not be ignored as they are potentially large. Dynamic economic gains -- such as from learning by doing and technological progress--and political gains--such as decreasing dependency on developed countries markets and enhancing bargaining power vis-a-vis developed countries--may also be important.

In Chapter III several of the above issues were examined in the context of the ASEAN countries. ASEAN is a group of dissimilar countries, varying widely in terms of size, resource endowment, and economic development. Trade among the countries and tariff levels were high in the initial period, making prospects for welfare gains good. At the same time, trade as a share of total production was high, making trade diversion likely, though the negative effect would be lessened because of the large share of trade already conducted with member countries. Initial factor endowments suggest that complementarities exist, even among the resource-rich countries, with Thailand showing

strong comparative advantage in agriculture and along with Malaysia in tin, while Indonesia and Malaysia have comparative advantage in forest products and most minerals. Singapore's comparative advantage in the region would be in physical and human capital. The other countries, with the exception of the Philippines, are relatively well-endowed with less skilled or unskilled labor. Export specialization indices verified this result, despite the general similarity in the pattern of export specialization among the countries. In terms of specific commodities, the potential for trade expansion is largest in manufactured goods. Several chemical products hold promise in Indonesia, while Malaysia's exports of electrical machinery and equipment and rubber manufactures are likely to increase with closer integration. The Philippines and Thailand are important exporters of several light manufactures, including furniture and leather products. The Philippines is also the only important producer of a few chemical products in the region. Singapore would expand exports of nonelectrical and electrical equipment.

Prospects for intra-industry trade and gains from economies of scale also appear promising particularly in intermediate and capital goods. But barriers to intra-regional trade expansion remain high. In some industries, it was found that a country was highly competitive in the world economy and yet had negligible trade shares of member countries. A look at tariff barriers showed that indeed, tariff structures in the member countries were biased against the goods in which other members specialized and the preferences offered under the

current PTA did not correct this bias. An expansion and deepening of tariff preferences could serve to address this problem.

To examine the potential effects of an enhanced ASEAN PTA, a variant of the Armington model developed by Tyers is used. The model was selected because it allowed analysis of the effect of integration on trade and production, while considering the influence of supply conditions and and income growth.

This approach is especially important when looking at ASEAN because it goes beyond the estimation of traditional potential welfare gains due to trade creation and trade diversion, and considers prospective growth of exports, imports, and production as well as the change in the balance of trade in the region.

In the analysis, three different policy options were considered: (1) a 20 percent across-the-board reduction in intra-ASEAN tariffs; (2) a 50 percent reduction over 5 years for Malaysia, Singapore, and Thailand, and a slower rate (50 percent over 7 years) for Indonesia and the Philippines following the agreement made at the third ASEAN summit meeting; and (3) a free trade area for ASEAN.

The results of this section are summarized in Tables 6.1 and 6.2. In Table 6.1, the effect on total manufactures including beverages and tobacco are given, while Table 6.2 presents results excluding these two categories. The results of the two tables differ sharply only in Singapore, which would import considerably less from other ASEAN countries if these two products are excluded. The rest of the discussion will use the results excluding beverages and tobacco in Table 6.2. For the resource-rich countries, imports from other ASEAN

Table	6.	1
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## Summary of the Effects of Tariff Preferences in ASEAN on Total Manufactured Goods (percentage change)

			D	4 1 1	Imports from				Remarks to				
	Production		produced consumption		ASEAN		Rest of the world		ASEAN		World		
	US\$ <b>m</b>	X	US\$m	x	US\$m	x	US\$∎	x	IJS\$m	X	US\$m	x	
Indonesia													
20% reduction	-3.77	-0.03	-19.57	-0.18	57.93	8.36	-25.09	-0.25	13.42	2.42	15.80	0.57	
50% reduction	-10.17	-0.07	-49.21	-0.44	125.30	18.08	-48.77	-0.48	36.05	6.49	39.05	1.41	
Free trade	- 39.87	-0.29	-158.68	-1.42	427.57	61.68	-170.20	-1.68	102.00	18.36	118.81	4.29	
Malaysia													
20% reduction	-81.42	-0.47	-41,36	-0.43	84.46	6.49	-29.26	-0.31	20.04	1.09	-40.06	-0.52	
50% reduction	-179.79	-1.03	-110.80	-1.15	242.76	18.66	-87.76	-0.93	62.69	3.42	-68.99	-0.90	
Free trade	-464.49	-2.67	-296.10	-3.06	547.66	44.18	-181.10	-1.93	211.12	11.51	-168.39	-2.19	
Philippines													
20% reduction	17.58	0.15	-3.53	-0.04	8.94	7.72	-1.96	-0.06	21.68	6.37	21.11	0.69	
50% reduction	48.65	0.43	-8.95	-0.11	19.04	16.42	-2.42	-0.07	59.43	17.47	57.59	1.88	
Free trade	119.39	1.05	-26.28	-0.32	62.70	54.10	-5.55	.0.16	151.82	44.63	145.67	4.74	
Singapore													
20% reduction	-347.41	-1.78	-70.97	-1.41	7.47	0.29	51.43	0.35	95.41	6.35	-276.44	-1.91	
50% reduction	-746.00	-3.82	-166.61	-3.31	26.62	1.05	115.51	0.78	249.62	16.59	-579.39	-4.00	
Free trade	-1663.61	-8.52	-411.97	-8.19	97.23	3.83	265.78	1.79	663.76	\$4.15	-1251.64	-8.64	
Thailand						•							
20% reduction	20,17	0.07	-14.44	-0.06	28,33	9.62	-5.15	-0.08	36.58	5.18	34,62	0.77	
50% reduction	47.36	0.16	-41.43	-0.16	87.31	29.65	-13.64	-0.21	93.42	13.23	88.79	1.97	
Free trade	133.61	0.44	-114.03	-0.44	233.37	79.25	-26.30	-0.41	266.83	37.78	247.65	5.49	

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### Table 6.2

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# Summary of the Effects of Tariff Preferences in ASEAN on Total Manufactured Goods (less ISIC 313 and 314) (percentage change)

		· · · · · · · · · · · · · · · · · · ·			Imports from				-				
	Production		produced consumption		ASEAN		Rest of the world		ASEAN		World		
	US\$ <b>m</b>	X	US\$ <b>m</b>	x	US\$2	X	US\$ri	x	US\$m	X	US\$ <b>m</b>	*	
Indonesia													
20% reduction	-3.57	-0.03	-18.42	-0.21	57.54	8.32	-25.11	-0.25	12.44	2.25	14.85	0.54	
50% reduction	-10.03	-0.09	-45.21	-0.52	124.30	17.98	-48.86	-0.48	32.13	5.82	35.19	1.28	
Free trade	-43.52	-0.38	-141.78	-1.62	422.12	61.05	-170.78	-1.69	81.17	14.71	98.25	3.56	
Malaysia													
20% reduction	-82.84	-0.50	-39.87	-0.44	82.92	6.40	-29.45	-0.32	17.12	0.94	-42.97	-0.56	
50% reduction	-186,01	-1.11	-104.76	-1.16	236.59	18.27	-88.60	-0,95	50.37	2.76	-81.25	-1.06	
Free trade	-505.37	-3.02	-262.73	-2.91	542.07	41.86	-186.87	-2.00	136.52	7.48	-242.64	-3.16	
Philippines													
20% reduction	17.55	0.18	-3.54	-0.05	8,94	7.72	-2.15	-0.06	21.65	6.37	21.09	0.69	
50% reduction	48.52	0.49	-8.99	-0.13	19.04	16.42	-3.24	-0.10	59.32	17.44	57.51	1.88	
Free trade	118.67	1.19	-26.59	-0.38	62.70	54.10	-11.28	-0.34	151.21	44.46	145.26	4.74	
Singapore													
20% reduction	-347.23	-1.80	-69.21	-1.42	3.83	0.15	52.70	0.36	93.73	6.26	-278.03	-1.93	
50% reduction	-744.41	-3.86	-159.36	-3.27	11.45	0.45	120.83	0.82	243.37	16.27	-585.05	-4.07	
Free trade	-1652.37	-8,58	-371.78	-7.62	7.90	0.31	296.77	2.02	632.85	42.30	-1280.58	-8.90	
Thailand													
20% reduction	21.62	0.08	-12.96	-0.05	28.25	9.62	-5.30	-0.08	36.54	5.18	34.59	0.77	
50% reduction	52.03	0.18	-36.62	-0.15	87.06	29,64	-14.27	-0.23	93.25	13.21	88.65	1.97	
Free trade	147,70	0.52	-98.94	-0.41	232.66	79.23	-30.71	-0.49	265.70	37.63	246.65	5.47	

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countries increase from an average of nearly 10 percent with a 20 percent across-the-board tariff reduction to about 50 percent from the base period as the degree of liberalization is increased. For Singapore, the effect on imports is much lower because of its low initial tariffs. The increase in intra-ASEAN imports will amount to nearly \$20 million with 20 percent reductions to nearly \$2 billion in the free trade case. Exports increase by less in percentage terms, but of course in value terms match the increase in imports. Singapore has the largest increase in exports to other ASEAN countries in value terms, but it experiences a sharp drop in its exports to the rest of the world. Because of this decrease in exports to the rest of the world, total exports decline for Singapore. Malaysia experiences the smallest increase in exports to other ASEAN countries and in conjunction with the decrease in exports to the rest of the world, faces an overall drop in exports. Indonesia, the Philippines, and Thailand, on the other hand, increase total exports. For Indonesia, however, the increase is not large enough to much improve its balance of trade position.

Total consumption (domestically produced consumption plus imports) increases slightly in the resource-rich countries, but declines slightly in Singapore. Indonesia has the largest increase in consumption, amounting to \$14 million with a 20 percent tariff reduction to \$110 million with free trade.

The effect on total production also strengthens with the degree tariff liberalization. Total production declines slightly in Indonesia, and by more in Malaysia and Singapore. The decline in Indonesia is almost completely accounted for by the fall in production of food

products, where the Philippines and Thailand have strong comparative advantage. In Malaysia, the decline in production of food products, along with decline in production of electrical machinery accounts for the overall decrease in production. The drop in electrical machinery may be due to an aggregation problem and complicated by the high degree of intra-industry trade occuring in the region. In Singapore, the decline in production will come largely in light manufactures such as textiles.

There is some redistribution of production with some of the more capital-intensive industries expanding in Singapore while other industries expand elsewhere. The industrial breakcown of expanding and contracting industries generally conform to the patterns of export-specialization.

Summarizing the changing distribution of production by industry, in the food production industry, Thailand would increase its production while the Philippines would maintain initial production levels and production in all other countries would decline. All of the resource-rich countries would increase production in textiles, but production would expand significantly only in Malaysia. In contrast, Singapore would face a sharp drop in the production in textiles. Indonesia and Malaysia would become more important producers of wood products while production in Singapore and Thailand would decline. Production of paper products would increase in Indonesia, replacing production in Malaysia and Singapore, while Thailand would become a more important producer of publishing and printed materials. Singapore and the Philippines would increase production of plastic materials and

non-metal products while that of all other countries would decline or remain unchanged. Singapore would also increase its production share of the heavy industries, such as industrial chemicals, iron and steel, metal products, and transport equipment, while shares of other countries would generally decline. On the other hand, Singapore's production share of electrical and non-electrical machinery would drop sharply. Malaysia, another large producer of electrical machinery in the region, also would see declining shares while those of the other countries would increase.

Considering even moderate levels of income growth eliminates most of the negative production and consumption effects, and amplifies the growth in intra-regional trade. Differentials in economic growth rates cause imports from the region to increase by relatively more in the faster growing countries.

#### III. Conclusions and Suggestions for Further Research

In conclusion, an expansion of the ASEAN preferential trading arrangements will lead to largely expanded intra-regional trade and increased efficiency in production in the region. If intermediate and capital goods are stressed in the liberalization process, additional gains will be reaped through the achievement of economies of scale and intra-industry trade, and total welfare gains are likely to be even larger. The industrial projects can be effectively used in conjunction with the preferential trading arrangements in these industries. Intra-ASEAN trade has clearly been limited by the structure of
protection and the reluctance of ASEAN countries to correct the biases against other ASEAN countries inherent in this protection structure.

Because the model used in the disseration is an exercise in comparative statics, it does not incorporate dynamic considerations such as economies of scale and learning by doing, which as discussed earlier may be important. The brief examination of scale economies in the disseration shows that the potential for gains through achievement of economies of scale are large. This possibility, however, was not included in the results of the modal. Other potentially large dynamic benefits were also not considered and hence the benefits of ASEAN trade liberalization are likely to be understated in the dissertation. A more detailed industrial level study will be required to estimate the effects some of these dynamic factors.

Trade expansion could also occur in some industries that cannot be anticipated a priori. For example, more rapid industrialization in Indonesia can increase its comparative advantage in industries where production is presently limited. The deregulation that is occurring throughout the region may also provide additional opportunities for trade expansion.

A more detailed industrial breakdown may be necessary in some industries to more precisely measure potential effects of tariff reductions. For example, the category of rubber products has relatively high average tariff levels in Malaysia because one component, automobile tires, is highly protected. The same problem is found in electrical machinery and equipment. Aggregation may distort the results in some cases.

Data for Singapore which more accurately accounts for re-exports would improve the results. The relatively large declines in production and exports appear to come in part from the low values for domestically-produced consumption.

Finally, other feedback effects on the economy due to the decrease in tariff levels and the increase in exports may also be important and are not considered in the model. Decreases in the production of some commodities will free resources which may enable larger production increases in expanding industries than allowed for in the model. Additionally, an examination of the effect of intermediate goods would also improve the results.

Despite its shortcomings, this disseration clearly shows that increasing intra-regional trade liberalization is beneficial to ASEAN countries. The effect on total trade is relatively small even with the creation of a free trade area in ASEAN with total exports and imports changing by less than 5 percent in most countries. This corresponds to other studies that find that the total welfare effect of integration is small. However, the increase intra-ASEAN trade was found to be substantial even in the case of a 20 percent across-the-board preferential reduction. If one of the goals of ASEAN cooperation in trade is to diversify exports away from the U.S. and other developed country markets and toward ASEAN markets then an enhanced PTA will certainly accomplish this goal.

Liberalization in food products would have the most dramatic effect on both trade and production but the relatively large drop in production in Indonesia and Malaysia may have some negative social implications in

terms of unemployment but at the same time has positive effects on consumption. More food can be consumed if imported at lower prices. Some short-term compensatory scheme, particularly for Indonesia, may be in order in this sector to assist with the necessary restructuring before liberalization can occur. This compensatory scheme would also address the problem of the worsening belance-of-trade position of Indonesia because of the large increase in imports of food products.

In other manufactures, the gains and losses are more evenly distributed and larger tariff preferences can be adopted without large-scale industrial dislocation. Larger preferences will increase the benefits and if preferences are offered in intermediate and capital goods the effect may be further enhanced by increases in intra-industry trade and gains from the achievement of economies of scale. Other dynamic gains may also increase the welfare of the region.

It is hoped that the results of this study will encourage ASEAN leaders to move to implement the agreements of the third summit and look at expanded economic cooperation as a means to increase intra-regional trade and efficiency in the region.

1. One implication of this structure of protection is that the effect of tariff preferences on trade will be limited by the extent to which tariffs are not effectively protecting industries.

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#### NOTE

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#### APPENDIX A: REVEALED COMPARATIVE ADVANTAGE

The index of revealed comparative advantage as introduced by Balassa (1965) is a useful summary measure of export patterns. As such it may more appropriately called the export specialization ratio. It is simple to calculate and avoid scale problems of countries size or commodity significance. Balassa pointed out that it is preferable to export-import ratios normally used when looking at trade patterns because as long as all exporter are sublject to the same tariff, data on relative export performance are not distorted by differences in the degree of tariff protection. Distortions will be present to the extent that export subsidies, etc., are used, however. Nonetheless, since export subsidies tend to be less prevalent than import barriers the degree of distortion is lower than a measure using import figures. Further, it has been found that the export specialization index is highly correlated with net trade balances (Ballance et al. 1985).

Several recent articles have criticized the index. Hillman (1980) found that theoretically cross commodity comparisons of the index are independent of pre-trade prices which are the key to the factor proportions theory. But under some rather restrictive assumptions, including homothethic, identical preferences, then cross country comparisons of the index may reflect pre-trade prices. In an empirical test of Hillman, Yeats (1985) found that cross commodity comparisons failed within a given country and it is necessary to use cross country comparisons to determine comparative advantage. Nonetheless, none of these criticisms discredits the usefulness of the export specialization

index as a measure of trade intensity, though care should be taken in analyzing the results.

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#### APPENDIX E: INTRA-INDUSTRY TRADE

Linder felt that the orthodox Hecksher-Ohlin view, was too simplistic and ignored demand-related factors. He hypothesized that because a firm will attempt to broaden its markets and export only after exhausting the domestic market for its product, it follows that exporters will look to countries with similar demand patterns as the most likely markets for their products. Linder stresses the role of product differentiation between goods and monopolistic competition as a trade-creating factor. It has also been suggested that the essential cause of intra-industry trade is the existence of economies of scale in the presence of product differentiation (Tharakan 1986). If plants would like to benefit from the reduced costs of production per unit of output due to scale, they will not be able to produce all varieties of a given product.

Some writers (Finger 1975, Lipsey 1976) expressed doubt that intraindustry trade was in fact trade in commodities with similar factor characteristics because within a 3-digit SITC category there is wide variation in factor characteristics. They suggest that the high intraindustry trade values may only be a statistical artifact resulting from inadequate disagregation. Nonetheless, more disaggregated data still shows the phenomena occurring to the point where it does not seem likely to be simply a statistical artifact (Gray 1979).

A substantial number of articles have been written to test the Linder hypothesis. Most verify the hypothesis by demonstrating that there is significant statistical association between trade intensity and

the similarity in taste as measured by the nearness of income levels. Most of these studies, however, have not looked at the effect of distance or transportation costs nor political ties. Kennedy and McHugh (1983) point out that trade is likely to be higher with allies than with unfriendly nations. They, as well as others, (Kleiman and Kop, 1984) hypothesized that the association between income levels and trade may be the result of the clustering of relevent countries which would also assume lower transport costs. To test this hypothesis, Kennedy and McHugh looked at the difference in income and import intensity since this will take into account effects of distance and political factors to the extent that they stay constant through time. They found that these was no association between income differences and trade intensity for U.S. trade patterns. Kleiman and Kop, on the other hand, find a positive association between a country's own income and those of its partners once other factors (geogramical ties, the role of the United States, etc.) have been taken into account.

Since LDCs tend to be closer to other LDCs both physically and also culturally, the costs of marketing, etc., should thus be smaller if the domestic producer is faced with an export market which is similar to the domestic market. Further, as Havlyshyn and Wolf (1981, p. 11-12) point out, with inward-looking industrialization patterns, the structure and characteristic of production will be determined by those of demand. The similarity in production stuctures in LDCs would infer, following Linder, that there should be some tendency toward increasing trade among LDCs. Indeed, Linder explicitly states that the level of trade among

developing countries should be high, since developing countries are more similar to one another than they are to developed countries.

However, Kleiman and Kop (1984) find that the income effect is stronger in the trade between industrialized countries than elsewhere, and conclude that the Linder effect may be mainly, if not exclusively, a rich country phenomenon. For Linder trade to occur, it may require that the industrial sectors be sufficiently advanced to permit production of goods amenable to product differentiation. Indeed, several atuthors have found that the extent of intra-industry trade increases with the level of economic development, size of domestic markets, and product diversity (Havrylyshyn and Civan 1984 and Balassa 1986). Balassa (1986) also found that the reduction of overall trade barriers and economic integration has a greater effect on increasing intra-industry rather than inter-industry trade. Openness of the domestic economy will also positively affect levels of intra-industry trade. These tend to be characteristics associated more with developed than developing countries.

#### APPENDIX C: SUPPLEMENTARY TABLES FOR CHAPTER III

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#### Table 3.20

#### Intra-ASEAN Trade with and without Singapore, 1970-88

		Expo	orts		Imports						
	ASEA	N w/Singapore	ASEAN w/o Singapore		ASEA	N w/Singapore	ASEAN w/o Singapore				
Year	US\$ m	As % of total	US\$ m	As % of total	US\$ m	As % of total	US\$	As % of total			
1970	1,336	21.7	272	6.0	1,241	16.4	328	6.7			
1971	1,488	22.1	315	6.4	1,261	15.2	326	6.1			
1972	1.592	19.6	267	4.6	1,359	14.1	287	4.7			
1973	2,477	17.9	346	3.4	2,123	14.4	377	4.1			
1974	3,673	15.4	532	3.0	3,189	13.4	539	3.6			
1975	3,788	17.1	546	3.3	3,214	13.2	599	3.9			
1976	4,475	16.1	736	3.6	4.178	15.4	872	5.0			
1977	5.345	15.8	894	3.5	5.077	16.1	1.067	5.3			
1978	6.384	16.4	945	3.3	5.821	15.4	978	4.2			
1979	9,407	17.4	1,258	3.2	8,534	17.4	1,395	4.8			
1980	12,867	17.9	1,833	3.5	11,742	17.7	1,897	4.8			
1981	13,879	18.6	2,036	3.9	12,681	17.1	2,103	4.8			
1982	16,732	22.8	2,055	4.1	15,784	20.1	2,193	4.7			
1983	18,018	24.0	2,129	4.3	17,086	21.3	2,332	4.8			
1984	16,163	20.2	2,298	4.2	14,964	19.6	2,585	5.7			
1985	13,893	19.2	2,445	5.0	12,888	19.6	2,626	6.9			
1986	12,088	17.9	1,832	4.1	11,323	17.8	2,007	5.5			
1987	15.825	18.8	2.443	4.5	14.927	18.4	2.645	5.7			
1988	19,041	18.1	2,585	3.9	18,098	17.2	2,889	4.9			

<u>Sources</u>: International Monetary Fund, <u>Direction of Trade Statistics</u>, Annuals 1970-76, 1971-77, Yearbooks 1979 through 1989, and computer data tapes.

#### Table 3.21

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### Revealed Comparative Advantage<sup>r</sup> of ASEAN for Selected Commodities, 1983/84 Average

SITC	Commodity	ASEAN	Indo- nesia	Malay- sia	Philip- pines	Sing- apore	Thai- land
025	Eggs	0.22	0.00	0.29	0.00	0.17	1.08
034	Fresh fish	0.73	0.26	0.15	1.61	1.02	1.72
035	Fish, dried or salted	0.51	0.41	0.22	0.51	0.62	1.11
036	Crustaceans or mollusks	2.61	2.95	1.27	2.70	0.63	11.76
037	Fish, etc., prepared or preserved	2.91	0.13	2.01	5.26	0.26	20.82
042	Rice	6.57	0.00	0.05	0.48	0.04	70.13
043	Barley	1.12	0.00	0.00	0.00	3.29	0.00
044	Maize	0.96	0.09	0.00	0.00	0.17	9.43
045	Other cereals	0.59	0.00	0.00	0.00	0.40	4.85
047	Other cereal meals & flours	1.57	0.00	0.10	0.00	0.20	16.01
048	Cereal preparations	0.82	0.15	0.86	0.51.	1.32	1.21
054	Vegetables, fresh	2.45	0.39	0.21	0.22	0.41	23.07
056	Vegetables, prepared	1.10	0.02	0.29	0.18	0.50	9.20
057	Fruits & nuts	0.77	0.06	0.27	7.34	0.35	0.64
058	Fruit, preserved	1.51	0.02	0.72	7.71	0.67	6.37
061	Sugar & honey	1.29	0.17	0.20	9.11	0.02	6.02
062	Sugar confectionery	0.33	0.04	0.21	1.59	0.42	0.22
071	Coffee & substitutes	1.41	3.34	0.06	1.75	0.76	0.44
072	Cocoa	1.94	0.99	4.67	1.42	1.74	0.00
074	Теа	2.44	7.01	0.05	0.00	1.13	0.10
075	Spices	6.05	7.78	4.10	0.05	7.83	2.91
081	Feeding stuff for animals	0.63	0.50	0.55	1.66	0.29	1.64
091	Margarine & shortening	1.28	0.00	3.05	0.51	1.82	0.00
098	Edible products & preparations	0.60	0.06	0.65	0.72	0.56	2.32
111	Non-alcoholic beverages	1.11	0.01	0.53	0.00	2.93	0.00
121	Tobacco	0.76	0.66	0.00	2.38	0.02	4.27
223	Oil seeds	1.96	1.13	2.91	5.71	1.75	0.33

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## Revealed Comparative Advantage of ASEAN for Selected Commodities, 1983/84 Average

SITC	Commodity	ASEAN	Indo- nesia	Malay- sia	Philip- pines	Sing- apore	Thai- land
232	Natural rubber	19.50	15.11	37.13	0.37	14.24	27.86
245	Fuel wood	4.44	2.20	0.99	16.87	3.82	11.97
246	Pulp wood r	0.69	0.37	1.91	2.41	0.04	0.00
247	Sawlogs & veneer	7.36	3.81	28.25	5.58	0.12	0.03
248	Wood simply worked	2.23	0.99	6.11	4.26	1.14	0.01
264	Jute	1.55	0.00	0.00	0.00	0.06	16.45
265	Vegetable textile fibers	1.96	0.00	0.00	26.46	0.14	0.63
273	Stone, sand, & gravel	0.87	1.00	1.59	0.46	0.10	2.01
278	Other crude minerals	0.41	0.05	0.17	0.27	0.53	1.76
282	Waste & scrap metal of iron and steel	0.30	0.01	0.07	0.04	0.39	1.63
287	Copper ores	1.52	2.01	0.85	6.57	0.75	0.46
289	Ores & concentrates of precious metals	1.88	0.00	0.04	25.95	0.15	0.00
291	Crude animal materials	1.35	1.14	0.16	1.15	1.27	5.15
292	Crude vegetable materials	1.23	1.53	0.15	0.91	1.24	2.95
333	Crude petroleum	1.84	4.85	2.05	0.00	0.03	0.00
334	Gasoline	2.61	0.99	0.49	0.37	6.39	0.09
335	Residual petroleum products	1.80	3.40	0.01	0.36	2.30	0.01
341	Gas, natural & manufactured	2.89	8.21	2.10	0.05	0.21	0.06
424	Fixed vegetable oils	19.57	2.47	62.78	51.83	6.49	0.82
431	Processed animal vegetable oils	4.18	2.30	6.60	2.60	5.60	0.61
512	Alcohols, phenols, etc.	0.45	0.12	0.21	2.49	0.48	0.38
515	Organic-inorganic compounds	0.57	0.01	0.01	0.53	1.55	0.00
551	Essential oils, perfume, etc.	0.59	1.14	0.07	0.27	0.47	0.74
598	Miscellaneous chemical products	0.50	0.00	0.54	0.39	1.04	0.04
612	Leather manufactures	0.30	0.04	0.26	0.08	0.11	2.07
621	Rubber materials	0.63	0.00	1.81	0.08	0.59	0.49
628	Rubber articles	0.54	0.00	0.65	0.12	0.71	1.65

# Revealed Comparative Advantage of ASEAN for Selected Commodities, 1983/84 Average

SITC	Commodity	ASEAN	Indo- nesia	Malay- sia	Philip- pines	Sing- apore	Thai- land
634	Veneers, plywood, etc.	6.95	14.62	4.39	7.51	3.44	1.20
635	Wood manufactures	1.30	0.26	1.27	5.60	0.65	3.76
651	Textile yarn	0.33	0.09	0.34	0.25	0.27	1.34
652	Woven, cotton fabrics	0.67	0.39	0.79	0.00	0.53	2.26
653	Woven, man-made fabrics	1.18	0.69	0.84	0.01	1.32	3.82
657	Special textile fabrics	0.31	0.02	0.07	1.25	0.31	1.10
658	Textile articles	0.57	0.07	0.22	0.72	0.45	3.25
662	Clay products	0.27	0.01	0.19	0.51	0.29	1.06
667	Precious, semi-precious stones	0.57	0.03	0.06	0.04	0.16	5.26
671	Pig iron	0.21	0.10	0.01	2.40	0.03	0.00
682	Copper	0.21	0.01	0.04	2.21	0.12	0.00
683	Nickel	0.60	0.00	0.07	6.12	0.45	0.00
687	Tin	15.61	11.16	33.72	0.00	8.24	28.15
71.6	Rotating electric plant and parts	0.38	0.00	0.11	0.03	1.03	0.00
718	Other power generating machinery	0.45	0.00	1.57	0.00	0.36	0.00
723	Civil engineering equipment	0.66	0.01	0.35	0.03	1.64	0.27
743	Other pumps, centrifuges, etc.	0.48	0.00	0.18	0.00	1.27	0.05
749	Non-electrical machinery parts	0.58	0.24	0.09	0.01	1.32	0.44
752	Automatic data processing equipment	0.49	0.00	0.03	0.00	1.42	0.00
759	Office machinery parts	0.59	0.00	0.07	0.02	1.64	0.08
761.	Television receivers	1.36	0.01	0.68	0.00	3.56	0.06
762	Radio broadcast receivers	2.43	0.01	2.24	0.69	5.60	0.05
763	Sound recorders, phonographs	0.43	0.00	0.08	0.01	1.20	0.00
764	Telecommunication equipment	0.57	0.01	0.57	0.09	1.29	0.04
771	Electrical power machinery	0.80	0.00	1.32	0.12	1.50	0.11
772	Switchgear	1.56	0.00	0.48	0.41	2.73	5.42
775	Household type equipment	0.51	0.00	0.09	0.05	1.40	0.04

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### Revealed Comparative Advantage of ASEAN for Selected Commodities, 1983/84 Average

SITC	Commodity	ASEAN .	Indo- nesia	Malay- sia	Philip- pines	Sing- apore	Thai- land
776	Transistors, valves, etc.	3.73	. 0.42	8.94	3.52	4.45	0.00
778	Electrical machinery	0.45	0.00	0.31	0.23	1.00	0.35
793	Ships and boats	0.74	0.00	0.38	0.01	1.94	0.00
821	Furniture	0.54	0.04	0.11	2.88	0.58	1.09
831	Travel goods & handbags	0.50	0.01	0.03	1.01	0.59	2.36
842	Outer garments, men & boys	1.07	0.77	0.47	3.15	0.81	2.77
843	Outer garments, women & girls	1.17	0.60	0.48	1.96	0.93	4.83
844	Under garments	2.24	1.63	1.85	1.61	1.60	7.77
845	Outer garments, knitted	0.91	0.06	0.47	2.51	1.20	2.25
846	Under garments, knitted	1.46	0.38	1.19	6.22	1.38	2.21
847	Clothing accessories	0.68	0.34	1.13	0.59	0.40	1.89
848	Non-textile accessories	0.53	0.13	1.49	0.81	0.11	0.96
851	Footwear	0.38	0.03	0.20	1.58	0.13	1.87
885	Watches & clocks	0.51	0.00	0.23	0.21	1.15	0.59
893	Plastic materials	0.50	0.01	0.35	0.49	0.72	1.53
897	Jewelry	0.56	0.15	0.20	0.43	0.80	1.87
898	Musical instruments	0.58	0.31	0.21	0.07	1.28	0.05
899	Other manufactured articles	0.94	0.06	0.26	7.33	0.47	2.14
911	Postal packages	0.61	0.34	0.18	0.00	1.39	0.00
931	Special transactions	3.72	0.72	0.14	22.77	5.20	1,21
941	Animals, live	0.55	0.00	0.66	1.53	0.42	1.76

Sources: United Nations, Commodity Trade Statistics, 1983 and 1984.

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#### Table 3.22

# Revealed Comparative Advantage of ASEAN for Selected Manufactured Goods, 1983/84 Average

SITC	Commodity	ASEAN	Indo- nesia	Malay- sia	Philip- pines	Sing- apore	Thai- land
512	Alcohols, phenols, etc.	0.92	0.90	0.46	5.91	0.60	0.67
513	Carboxylic acids	0.41	0.12	0.27	1.86	0.41	0.01
515	Organic-inorganic compounds	1.17	0.10	0.02	1.26	1.91	0.00
522	Inorganic chemicals	0.39	1.51	0.33	0.13	0.32	0.15
531	Synthetic organic dyestuffs	0.32	1.58	0.02	0.25	0.30	0.10
532	Dyeing and tanning extracts	0.57	1.93	0.11	0.17	0.70	0.00
551	Essential oils, perfumes, etc.	1.21	8.63	0.15	0.63	0.58	1.32
553	Perfumery & cosmetics	0.84	3.92	0.68	0.11	0.64	0.35
554	Soap, cleansing, etc.	0.82	0.06	0.71	0.39	1.14	0.15
562	Fertilizers, manufactured	0.84	3.38	0.04	0.06	0.99	0.01
585	Other artificial resins	0.56	0.00	1.32	0.00	0.53	0.11
598	Miscellaneous chemical products	1.02	0.00	1.19	0.91	1.29	0.07
611	Leather	0.30	0.98	0.03	0.02	0.05	1.74
612	Leather manufactures	0.62	0.29	0.58	0.18	0.14	3.69
621	Rubber materials	1.28	0.00	4.00	0.18	0.73	0.88
628	Rubber articles	1.10	0.00	1.44	0.28	0.87	2.94
634	Veneers, plywood, etc.	14.20	111.12	9.69	17.80	4.25	2.14
635	Wood manufactures	2.66	1.96	2.80	13.28	0.81	6.70
651	Textile yarn	0.68	0.70	0.76	0.59	0.34	2.38
652	Woven, cotton fabrics	1.36	2.99	1.74	0.01	0.65	4.02
653	Woven, man-made fibers	2.41	5.25	1.86	0.02	1.63	6.81
654	Textile fabrics, woven, other	0.25	0.33	0.01	0.15	0.18	1.10
656	Tulle, lace, & embroidery	0.36	1.79	0.07	1.09	0.22	0.12
657	Special textile fabrics	0.64	0.12	0.16	2.96	0.38	1.96
658	Textile articles	1.16	0.51	0.48	1.71	0.55	5.79
659	Floor coverings	0.44	2.85	0.01	0.74	0.20	0.51

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#### Thai-Indo-Malay-Philip-Sing-ASEAN SITC Commodity nesia sia pines land apore 661 Lime, cement, & fabricated construction 1.05 1.48 0.50 1.37 1.09 1.35 materials 662 Clay products 0.56 0.04 0.42 1.20 0.36 1.89 664 Glass 0.57 0.30 0.57 0.63 0.51 1.05 665 Glassware 0.78 1.58 0.62 0.36 0.81 0.58 666 Pottery 0.46 0.00 0.67 1.98 0.26 0.62 667 Precious, semi-precious stones 1.16. 0.22 0.13 0.09 0.20 9.36 696 Cutlery 0.50 0.00 0.06 0.10 0.56 1.55 697 Household equipment of base metal 0.45 0.01 0.21 0.04 0.48 1.29 Rotating electric plant and parts 0.77 0.01 716 0.24 0.08 1.27 0.01 Other power generating machinery 718 0.91 0.00 3.46 0.00 0.45 0.00 Civil engineering equipment 723 1.35 0.07 0.77 0.06 2.02 0.47 Other pumps, centrifuges, etc. 743 0.97 0.00 0.39 0 01 1.57 0.08 Non-electrical machinery parts 749 1.19 1.83 0.21 0.03 1.63 0.79 0.68 0.00 751 Office machines 0.03 0.02 1.19 0.03 752 Automatic data processing machines 1.01 0.00 0.08 0.00 1.75 0.00 759 Office machinery parts 1.19 0.00 0.15 0.05 2.03 0.15 761 **Television receivers** 2.79 0.08 1.50 0.00 4.40 0.11 762 Radio-broadcast receivers 4.97 4.95 0.07 1.65 6.92 0.08 Sound recorders, phonographs 0.88 0.00 0.18 763 0.02 1.49 0.01 764 Telecommunications equipment 1.17 0.10 1.27 0.22 0.08 1.60 771 Electric power machinery 1.64 0.00 2.92 0.29 0.20 1.85 3.19 772 Switchgear 0.00 1.06 0.97 3.37 9.66 775 Household type equipment 1.03 0.00 0.20 0.13 1.73 0.08 776 Transistors, valves, etc. 7.62 3.23 19.74 8.34 5.49 0.00 Electrical machinery 0.93 0.03 0.68 1.23 778 0.55 0.63 793 Ships & boats 1.51 0.00 0.84 0.02 2.39 0.00

#### Revealed Comparative Advantage of ASEAN for Selected Manufactured Goods, 1983/84 Average

	Revealed	Comparative	Advant	age of	ASEAN
for	Selected	Manufactured	Goods	, 1983/	84 Average

SITC	Commodity	ASEAN	Indo- nesia	Malay- sia	Philip- pines	Sing- apore	Thai- land
821	Furniture	1.09	0.29	0.25	6.83	0.71	1.95
831	Travel goods & handbags	1.02	0.07	0.06	2.39	0.73	4.21
842	Outer garments, men & boys	2.19	5.85	1.03	7.46	1.00	4.93
843	Outer garments, women & girls	2.40	4.53	1.06	4.66	1.15	8.60
844	Under garments	4.57	12.42	4.08	3.81	1.98	13.83
845	Outer garments, knitted	1.86	0.45	1.03	5.95	1.48	4.00
846	Under garments, knitted	2.99	2.87	2.62	14.74	1.70	3.93
847	Clothing accessories	1.40	2.58	2.50	1.39	0.49	3.37
848	Non-textile accessories	1.08	1.02	3.28	1.92	0.13	1.71
851	Footwear	0.77	0,22	0.44	3.74	0.16	3.32
872	Medical instruments	0.75	0.00	0.81	0.00	1.04	0.14
883	Cinematograph film	0.69	6.87	0.00	0.00	0.17	0.59
884	Optical goods	0.74	0.00	0.03	0.89	0.94	1.37
885	Watches & clocks	1.04	0.00	0.51	0.50	1.42	1.05
893	Plastic materials	1.01	0.04	0.76	1.16	0.89	2.72
894	Baby carriages & toys	L.07	0.73	0.96	2.19	1.13	0.53
895	Office & stationery supplies	0.81	0.24	0.61	0.05	1.11	0.40
897	Jewelry	1.15	1.14	0.44	1.01	0.99	3.33
898	Musical instruments	1.18	2.35	0.47	0.16	1.58	0.08
899	Other manufactured articles	1.92	0.44	0.57	17.38	0.58	3.80

Sources: United Nations, Commodity Trade Statistics, 1983 and 1984.

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#### Table 3.23

#### Average Tariff and Margin of Preference of ASEAN for Selected Commodities, 1985

			Indonesia		aysia	Philippines		Singapore		Thailand	
SITC	Commodity	Average tariff	MOP(X)	Average tariff	HOP(X)	Average tariff	MOP(X)	Average tariff	MOP(%)	Average tariff	HOP(%)
025	Eggs	28.75	0.00	8.64	9.35	50.00	20.00	0.78	29.03	27.25	0.00
034	Fresh fish	29.42	0.00	0.00		27.50	10.00	0.00		60.00	0.00
035	Fish, dried or salted	19.50	2.56	33.13	28.11	50.00	15.00	0.00	••	97.00	0.00
036	Crustaceans or mollusks	30.00	2.03	10.45	100.00	50.00	20.00	0.00		61.00	0.00
037	Fish, etc., prepared or preserved	85.05	2.93	40.21	32.02	32.50	20.00	0.00		246.68	0.00
042	Rice	0.63	0.00	9.50	0.00	50.00	0.00	0.00		16.36	0.00
043	Barley	5.00	25.00	5.00	100.00	20.00	0.00	0.00		64.73	0.00
044	lfaize	5.00	25.00	0.00	••	50.00	25.00	0.00		69.79	0.00
045	Other cereals	5.71	22.08	3.11	67.86	30.00	11.85	0.00		69.08	0.00
047	Other cereal meals & flours	22.69	4.15	4.95	42.65	30,00	13.33	0.00		61.76	5.34
048	Cereal preparations	106.92	2.59	19.86	22.94	38.33	17.39	0.95	30.00	157.91	10.83
054	Vegetables, fresh	21.60	3.20	4.95	23.96	43.06	13.16	0.00		51.96	5.17
056	Vegetables, prepared	52.63	14.53	11.15	32.31	37.00	17.30	0.00		131.35	16.33
057	Fruits & nuts	68.66	16.91	48.01	16.72	50.00	15.89	0.00		337.75	4.54
058	Fruit, preserved	75.86	9.61	31.43	10.23	43.27	18.87	0.00		243.05	6.32
061	Sugar & honey	26.61	10.06	24.48	23.31	45.63	10.09	19.07	13.65	79.19	0.00
062	Sugar confectionery	238.08	3.31	51.08	21.19	50.00	20.00	2.50	80.00	349.22	0.00
071	Coffee & substitutes	37.73	11.75	8.37	19.83	50.00	10.00	0.00	• •	57.35	0.00
072	Cocoa	70.13	22.15	38.60	31.66	37.50	9.33	0.00	••	33.75	18.49
074	Tea	40.00	13.13	17.50	8.57	45.00	11.11	0.00	••	99.00	11.38
075	Spices	25.08	9.38	4.88	85.81	25.00	18.86	0.00	••	38.84	16.93
081	Feeding stuff for animals	15.50	5.60	4.98	15.71	27.27	7.59	0.00		16.60	0.00
091	Margarine & shortening	40.00	7.41	13.86	13.11	40.00	20.00	0.00		99.73	6.85
098	Edible products & preparations	64.16	4.03	17.73	27.31	50.71	17.65	0.00	••	85.21	8.94
111	Non-alcoholic beverages	54.22	28.44	81.29	47.77	50.00	20.00	13.56	0.00	52.84	0.00
121	Tobacco	15.00	21.00	673.14	0.00	41.11	4.32	1026.17	0.00	109.28	0.00

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#### Average Tariff and Margin of Preference of ASEAN for Selected Commodities, 1985

			Indonesia		Halaysia		Philippines		Singapore		land
SITO	Commodity	Average tariff	HOP(X)	Average tariff	HOP(X)	Average tariff	MOP(X)	Average tariff	HOP(X)	Average tariff	MOP(X)
223	011 seeds	20.00	5.00	5.00	0.00	30,00	20.00	0.00		68.94	14.42
232	Natural rubber	13.13	0.00	5.00	15.19	20.00	20.00	0.00		1.50	0.00
245	Fuel wood	20.00	6.25	12.50	22.00	10.00	5.00	0.00	••	9.00	0.00
246	Pulp wood	18.33	6.82	21.67	20.00	28.50	15.02	0.00	••	12.67	0.00
247	Sawlogs & veneer	20.00	1.65	19.00	7.72	10.00	10.00	0,00	••	7.50	0.00
248	Wood simply worked	30.00	1.04	16.67	9.50	23.33	2.86	0.00	••	19.17	0.00
264	Jute	15.00	3.33	2.00	100.00	10.00	20.00	0.00	••	41.50	19.28
265	Vegetable textile fibers	14.33	6.51	2.00	73.33	20.00	5.33	0.00	••	41.50	7.71
273	Stone, sand, & gravel	10.71	16.50	5.86	43.29	16.19	13.09	0.00	••	26.07	0.00
278	Other crude minerals	9.67	9.28	3.71	61.11	13.78	16.71	0.00		11.19	1.00
282	Waste & scrap metal of iron & steel	15.00	0.00	3.00	0.00	5.00	13.33	0.00	••	6.50	5.13
287	Copper ores	15.91	1.29	3.68	18.52	10.00	11.36	0.00		6.50	0.00
289	Ores & concentrates of precious metals	15.00	0.00	26.00	7.69	50.00	0.00	0.00		33.00	18.18
291	Crude animal materials	15.56	6.83	3.64	89.58	36.36	8.67	0.00		32.63	0.00
292	Crude vegetable materials	18.23	10.80	9.68	44.81	33.06	12.77	0.00	••	34.48	0.51
333	Crude petroleum	7.50	0.00	2.50	0.00	15.00	0.00	0.00		0.00	
334	Gasoline	15.00	0.98	18.92	0.00	22.29	6.28	7.21	0.00	20.37	1.40
335	Residual petroleum products	15.00	7.62	12.02	22.58	15.89	16.85	0.24	0.00	16.29	6.59
341	Gas, natural & manufactured	15.00	4.17	8.02	0.00	15.20	10.97	0.07	0.00	8.51	0.00
424	Fixed vegetable oils	28.10	6.53	4.63	36.49	26.25	16.90	0.00		26.78	25.65
431	Processed animal vegetable oils	18.73	6.53	5.10	65.75	30.28	19.27	0.00		23.67	6.90
512	Alcohols, phenols, etc.	24.68	2.83	48.51	2.74	25.28	20.22	352.87	0.00	113.63	0.00
513	Carboxylic acids	17.50	5.83	2.80	35.71	13.33	18.33	0.00	- 17	31.50	0.00
515 522	Organic-inorganic compounds Inorganic chemicals	14.83 15.92	5.37 5.83	5.42 20.42	28.72 12.72	10.00 16.73	20.42 20.38	0.00 0.00		24.00 24.05	0.00 0.00

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#### Average Tariff and Margin of Preference of ASEAN for Selected Commodities, 1985

			Indonesia		Malaysia		Philippines		Singapore		.1and
SIT	Commodity	Average tariff	MOP(X)	Avorage tariff	HOP(X)	Average tariff	MOP(X)	Average tariff	HOP(%)	Average tariff	MOP(%)
531	Synthetic organic dyestuffs	15.00	6.54	1.83	87.27	15.00	23,33	0.00		11.50	0.00
532	Dyeing and tanning extracts	15.00	4.63	4.17	82.00	20.00	20.00	0.00	• •	11.50	0.00
551	Essential oils, perfume, etc.	23.67	6.20	4.00	26.79	17.50	20.71	0.00	••	44.38	2.93
553	Perfumery & cosmetics	49.21	1.42	24.23	16.22	30.00	15.56	0.00		61.33	0.00
554	Soap, cleansing, etc.	40.11	3.92	17.82	2.46	43.33	20.00	0.00		69.40	15.37
562	Fertilizers, manufactured	10.13	0.00	6.81	1.86	16.82	5.14	0.00		1.50	0.00
585	Other artificial resins	24.76	4.57	6.17	31.17	23.33	19.64	0.00		62.34	18.64
598	Miscellaneous chemical products	15.59	6.24	9.40	17.69	20.96	18.73	0.00	••	17.89	1.02
611	Leather	30.00	4.29	38.57	14.17	24.76	16.92	0.00		44.52	7.37
612	Leather manufactures	42.50	5.44	40.80	14.98	37.50	13.33	0.00	••	60.63	0.00
621	Rubber materials	22.92	3.51	35.70	11.48	28.33	13.82	0.00		57.42	1.80
628	Rubber articles	21,43	2.17	33.56	8.45	27.38	19.18	0.00	••	57.63	0.00
634	Veneers, plywood, etc.	36.25	7.76	31.49	6.05	35.42	6.35	0.00		34.41	0.00
635	Wood manufactures	39.00	9.04	32.18	10.57	43.25	19.77	0.00	••	37.32	0.00
651	Textile yarn	25.06	7.82	18.59	8.82	32.50	10.55	0.00		37.34	0.44
652	Woven, cotton fabrics	59.37	1.84	87.24	0.50	37.78	10.59	0.00		111.42	0.00
653	Noven, man-made fabrics	62.45	3.26	78.29	2.18	39.37	9.72	0.00	••	87.00	3.58
654	Textile fabrics, woven, other	55.62	4.20	38.05	6.58	41.43	6.79	0.00		63.37	1.69
656	Tulle, lace, & embroidery	53.44	10.40	43.33	13.27	45.00	17.04	0.00		105.17	0.00
657	Special textile fabrics	28.59	3.43	37.67	10.01	37.06	15.71	0.00		57.53	14.09
658	Textile articles	88.63	0.15	44.57	8.72	50.00	10.92	0.00	••	60.60	7.58
659	Floor covering	47.40	8.71	33.90	8.11	48.00	7.96	0.00		84.93	1.72
661	Lime, cement, & fabricated construction materials	37.11	3.73	31.26	7.88	36.25	17.93	0.00	••	49.36	16.48
662	Clay products	45.71	10.00	47.58	0.83	32.86	8.70	0.00	••	54.14	17.41
664	Glass	26.46	4.05	33.84	8.31	35.00	11.07	0.00		71.45	18.55

#### Average Tariff and Margin of Preference of ASEAN for Selected Commodities, 1985

			Indonesia		Malaysia		Philippines		Singapore		.1and
SIT	Commodity	Average tariff	MOP(X)	Average tariff	MOP(X)	Average tariff	MOP(X)	Average tariff	MOP(%)	Average tariff	HOP(%)
665	Glassware	44.18	2.15	41.70	15.20	33.75	19.63	0.00	••	49.38	19.26
666	Pottery	108.56	0.00	41.64	3.74	50.00	16.67	0.00	••	98.88	18.58
667	Precious, semi-precious stones	28.89	5.77	10.83	11.15	40.67	0.82	0.00		7.67	21.74
671	Pig iron	15.00	3.46	3.25	0.00	7.08	10.29	0.00		17.32	16.34
682	Copper	J.6.97	8.43	6.12	8.40	20.42	18.47	0.00		16.34	0.00
683	Nickel	16.33	8.27	12.20	21.89	18.00	19.63	0.00	••	19.30	0.00
687	Tin	21.25	12.06	7.50	16.67	20.00	20.00	0.00	••	17.13	18.25
696	Cutlery	38.89	1.96	37.56	15.46	40.00	18.33	0.00		43.58	17.21
697	Household equipment of base metal	281.20	0.54	32.42	15.21	45.42	17.39	0.00	••	57.50	7.17
716	Rotating electric plant and parts	28.64	4.44	32.81	4.99	21.33	8.12	0.00		33.00	0.00
718	Other power generating machinery	23.47	7.57	8.33	0.00	24.09	16.51	0.00	• -	20,00	5.42
723	Civil engineering equipment	21.43	3.54	15.00	19.05	21.25	16.18	0.00	••	18.00	5.95
743	Other pumps, centrifuges, etc.	30.15	7.31	16.53	11.96	20.00	16.67	0.00		41.00	4.88
749	Non-electrical machinery parts	19.31	6.29	14.12	3.89	20.00	27.50	0.00	• <b>-</b> .	21.67	4.62
751	Office mechines	31.07	5.93	35.00	13.96	22.50	21.39	0.00		37.00	13.51
752	Automatic data processing machines	31.67	16.58	15.00	6.67	20.00	10.83	0.00		27.00	7.41
759	Office machinery parts	30.00	0.00	33.75	14.07	20.00	20.00	0.00		30.33	0.00
761	Television receivers	42.14	4.07	45.79	7.24	31.82	19.14	0.00	••	38.54	10,58
762	Radio-broadcast receivers	53.33	2.67	22.65	14.81	50.00	20.00	0.00		38.25	0.00
763	Sound recorders, phonographs	50.00	1.11	56.25	13.78	52.50	20.00	0.00		67.00	0.00
764	Talecommunications equipment	32.22	2.67	43.33	12.62	30.00	16.07	0.00	••	47.00	0.00
771	Electric power machinery	29.00	5.31	27.13	9.68	37.14	43.85	0.00	••	33.00	10.91
772	Switchgear	35.45	8.72	32.89	8.12	26.25	8.57	0.00		31.50	9.52
775	Household type equipment	43.23	5.94	37.83	10.39	43.27	17.11	11.23	0.00	39.35	8.08
776	Transistors, valves, etc.	15.83	2.11	26.46	11.18	21.82	8.75	0.00		37.00	5.41
778	Electrical machinery	23.00	4.64	22.66	6.60	25.19	15.63	0.12	30.00	34.94	6.09

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#### Average Tariff and Margin of Preference of ASEAN for Selected Commodities, 1985

		Indon	esia	Mala	ysia	Philip 	pines	Sing	ipore	Thai	land
SITC	: Commodity	Average tariff	MOP(X)	Average tariff	MOP(X)	Average tariff	MOP(X)	Average tariff	HOP(X)	Average tariff	MOP(1)
793	Ships & boats	15.14	0.00	6.06	4.95	21.27	16.74	0.00		18.30	0.00
821	Furniture	48.75	2.07	44.40	12.49	45.00	20.00	2.14	36.04	55.75	0.00
831	Travel goods & handbags	50.00	20.00	40.00	1.\.03	50.00	20.00	1.43	100.00	107.00	0.00
842	Outer garments, men & boys	532.91	0.00	48.48	0.53	50.00	5.26	5.00	33.64	67.00	8.48
843	Outer garments, women & girls	123.84	0.00	51.28	0.00	50.00	5.83	5.00	31.29	67.00	14.37
844	Under garments	79.15	0.00	39.58	1.23	50,00	13.33	3.33	35.83	150.88	0.00
845	Outer garments, knitted	130.11	0.00	44.48	0.54	50.00	3.75	4.04	22.38	65.00	10.96
846	Under garments, knitted	79.42	6.66	65.96	1.19	50,00	0.00	3.00	39.38	97.53	19.55
847	Clothing accessories	262.59	0.00	40.63	4.91	50.00	17.14	3.81	36.25	68.86	0.00
848	Non-textile accessories	42.41	5.14	38.06	9.34	46.11	10.42	2.78	33.50	87.06	3.32
851	Footwear	68.68	0.73	47.23	9.44	47.00	11.49	0.00	••	67.00	0.00
872	Medical instruments	25.00	6.67	15.00	0.00	10.00	20.00	0.00		25.00	0.00
883	Cinematograph film	35.43	3.48	0.00	••	7.43	20.00	0.00	••	57.65	0.00
884	Optical goods	31.00	7.42	7.19	5.22	31.25	19.20	0.00		36.94	0.00
885	Watches & clocks	23.18	11.56	9.09	13.00	25.00	13.27	0.00		46.09	3.35
893	Plastic materials	43.33	2.66	47.94	7.30	37.69	17.24	0.83	30.00	73.00	7.26
894	Baby carriages & toys	54.19	1.04	26.43	6.70	44.55	15.92	0.00		35.95	1.52
895	Office & stationery supplies	33.33	5.97	24.31	6.74	37.22	19.50	0.56	60.00	38.45	5.78
897	Jewelry	46.50	8.87	10.00	20.00	50.00	15.00	0.50	100.00	53.40	13.11
898	Husical instruments	47.69	10.07	25.81	7.73	26.00	20.00	0.00	••	42.85	0.00
899	Other manufactured articles	131.55	2.20	26.44	9.09	43.24	15.42	0.00		47.09	6.83
941	Animals, live	6.00	0.00	5.00	50.00	50.00	20.00	0.00	••	9.00	0.00

Sourca: United Nations, Trade Information System.

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#### APPENDIX D: THE ARMINGTON MODEL (1969)

Armington begins with a product demand function:

 $U = U(X) = U(X_{11}, X_{12}...X_{1m}, X_{21}...X_{nm})$  and a budget constraint D = PX.

Let:

C = (C<sub>1</sub>, C<sub>2</sub>...C<sub>m</sub>) be the vector of countries; X = (X<sub>1</sub>, X<sub>2</sub>...X<sub>n</sub>) be the vector of goods; X<sub>1</sub> = (X<sub>11</sub>, X<sub>12</sub>...X<sub>1m</sub>) be the vector of products (good i from country m); and P = (P<sub>11</sub>, P<sub>12</sub>...P<sub>1m</sub>, P<sub>21</sub>...P<sub>nm</sub>) be the price vector.

By assuming independent rates of marginal substitution (i.e., buyers relative evaluation between Japanese and German cameras is not affected by purchases of Japanese and Swiss watches), this can be simplified to be:

$$U = U^{1}(X_{1}, X_{2}...X_{n});$$
 where  $X_{i} = \phi_{i}(X_{11}, X_{12}...X_{im})$  for  $i = 1, 2...n$ .

Assuming constant elasticity of substitution (CES), the product demand function will become:

$$X_{i} = (b_{i1} X_{i1}^{,\rho_{i}} + \ldots + b_{im} X_{im}^{,\rho_{i}})^{\frac{1}{\rho_{i}}};$$
  
Where  $\sum_{k=1}^{m} b_{ik} = 1$  and  $\rho_{i} > -1.$ 

The first order conditions for cost minimization are:

$$\frac{\delta \phi_i / \delta X_{ij}}{\delta \phi_i / \delta X_{ik}} = \frac{b_{ij}}{b_{ik}} \left( \frac{X_{ik}}{X_{ij}} \right)^{1+\rho_i} = \frac{P_{ij}}{P_{ik}}; \ k = 1, \ 2...m.$$

Solving for X<sub>ik</sub>

$$X_{ik} = X_{ij} \left(\frac{b_{ik} P_{ij}}{b_{ij} P_{ik}}\right)^{\frac{1}{1+\rho_{1}}}$$

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Let 
$$\frac{1}{1+\rho_i} = \sigma_i;$$

Where  $\sigma_1$  is the elasticity of substitution and is defined to be:

$$\sigma_{i} = \frac{\frac{\delta \phi_{i} / \delta X_{ij}}{\delta \phi_{i} / \delta X_{ik}}}{X D_{ik} / X_{ij}} \left[ \frac{d (X_{ik} / X_{ij})}{d (P_{ij} / P_{ik})} \right]$$

Which is equal to:

$$\sigma_{i} = -\frac{\delta \log(X_{ik}/X_{ij})}{\delta \log(P_{ij}/P_{ik})} = \frac{1}{1+\rho_{i}}$$

Therefore,

$$X_{ik} = X_{ij} \left(\frac{\mathbf{b}_{ik} \mathbf{P}_{ij}}{\mathbf{b}_{ij} \mathbf{P}_{ik}}\right)^{\sigma_{i}}$$
  
and  $X_{i} = \left(\sum_{k=1}^{m} \mathbf{b}_{ik} \left[X_{ij} \left(\frac{\mathbf{b}_{ik} \mathbf{P}_{ij}}{\mathbf{b}_{ij} \mathbf{P}_{ik}}\right)^{\sigma_{i}}\right]^{\frac{\sigma_{i} - 1}{\sigma_{i}}}\right)^{\frac{\sigma_{i}}{\sigma_{i}} - 1}$ 

This can be simplified:

$$X_{i} = b_{ij}^{\sigma_{i}} X_{i} \left[\sum_{k=1}^{m} b_{ik}^{\sigma_{i}} \left(\frac{P_{ij}}{P_{ik}}\right)^{\sigma_{i}-1}\right]^{\frac{\sigma_{i}}{\sigma_{i}-1}}$$
  
or  $X_{ij} = b_{ij}^{\sigma_{i}} X_{i} \left[\sum_{k=1}^{m} b_{ik}^{\sigma_{i}} \left(\frac{P_{ij}}{P_{ik}}\right)^{\sigma_{i}-1}\right]^{\frac{\sigma_{i}}{1-\sigma_{i}}}$ 

The optimality condition is:

$$P_i - P_{ij} \div \frac{\delta \phi_i}{\delta X_{ij}}.$$

Since,

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$$\frac{\phi_{i}}{X_{ij}} = \frac{1}{\rho_{i}} \begin{bmatrix} \prod_{k=1}^{m} b_{ik} X_{ik} \end{bmatrix}^{-\rho_{i}} \begin{bmatrix} \frac{1}{\rho_{i}} \\ b_{ij} \end{bmatrix}^{-\rho_{i}} = (-\rho_{i})X_{ij}^{-\rho_{i}-1}$$

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$$= \mathbf{b}_{ij} \mathbf{X}_{ij}^{-\rho_{i}-1} \begin{bmatrix} \mathbf{m} \\ \mathbf{\Sigma} \\ \mathbf{k}=1 \end{bmatrix} \mathbf{b}_{ik} \mathbf{X}_{ik} \end{bmatrix}^{-\frac{1}{\rho_{i}}-1}$$

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Therefore,

$$P_{i} = P_{ij} \left[\sum_{k=1}^{m} b_{ik}^{\sigma_{i}} \left(\frac{P_{ij}}{P_{ik}}\right)^{\sigma_{i}-1}\right]^{\frac{1}{1-\sigma_{i}}}$$
  
and  $\left(\frac{P_{ij}}{P_{i}}\right)^{\sigma_{i}} = \left[\sum_{k=1}^{m} b_{ik}^{\sigma_{i}} \left(\frac{P_{ij}}{P_{ik}}\right)^{\sigma_{i}-1}\right]^{\frac{\sigma_{i}}{1-\sigma_{i}}}$   
or  $X_{ij} = b_{ij}^{\sigma} X_{i} \left(P_{ij}/P_{i}\right)^{-\sigma}.$ 

#### APPENDIX E: SUPPLEMENTARY TABLES FOR CHAPTER V

#### Table 5.18

#### ISIC Classifications

ISIC	Industry
311/12	Food Products
313	Beverages
314	Tobacco
321	Textiles
322	Wearing apparel
323	Leather and products
324	Footwear
331	Wood products
332	Furnicure, fixtures
341	Fayer and products
342	Printing, publishing
351	Industrial chemicals
352	Other chemical products
353	Petroleum refineries
354	Petroleum, coal products
355	Rubber products
356	Plastic products n.e.c.
361	Pottery, china, etc.
362	Glass and product:
369	Nonmetal products n.e. <sup>~</sup>
371	Iron and steel
372	Nonferrous metals
381	Metal products
382	Machinery n.e.c.
383	Electrical machinery
384	Transport equipment
385	Professional goods
390	Other industries

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Tab	le	5.	19a

ISIC	Indonesia	Malaysia	Philippines	Singapore	Thailand	Rest of the world	Total
3	11175.29	67.68	21.29	491,34	112.88	10117.94	21986.42
312	1233.62	20.37	9,23	11.18	88.04	468.70	1831.15
313	172.79	0.00	0.00	1.62	0.00	4.40	178.81
314	2248.46	0.00	0.00	0.15	0.00	2.33	2250.93
321	1285.96	0.00	0.20	1.99	1.13	329.75	1619.03
322	62.32	0.00	0.00	0.07	0.00	6.78	69.16
323	31.05	0.00	0.00	0.05	0.00	2.82	33.92
324	49.46	0.00	0.00	0.33	0.00	3.80	53.59
331	128.01	0.09	0.00	0.49	0.00	1.83	130.43
332	13.32	0.00	0.05	1.32	0.07	6.64	21.40
341	143.48	0.23	0.00	3.42	3.52	330.82	481.46
342	143,96	0.00	0.00	1.70	0.00	16.94	162.60
351	602.30	19.52	3.86	99.18	6.85	1833.13	2564.84
352	639.37	0.26	0.82	5.33	0.00	168.34	814.12
355	769.87	2.96	0.06	3.04	0.17	82.46	858.56
356	200.52	0.00	0.00	2.33	0.29	19.79	222.93
361	34.62	0.00	0.00	0.00	0.00	1.34	35.96
362	112.50	0.06	0.25	4.46	0.81	27.18	145.27
369	459.67	0.60	3.38	17.08	2.03	85.18	567.94
371	814.49	0.60	1.22	27.31	0.41	947.84	1791.87
381	591.96	1.91	0.00	27.92	1.01	497.46	1120.26
382	93.77	9.73	1.37	104.36	3.02	2661.59	2873.83
383	524.59	9.61	0.25	66.95	4.34	914.26	1519.99
384	807.38	1.73	0.59	98.59	1.21	1481.33	2390.82
385	1.57	0.00	0.00	11.70	0.00	194.54	207.81
390	10.25	0.00	0.00	0.78	0.00	28.69	39,72

Production and Imports of Indonesia, 1983-84 (US\$ millions)

<u>Sources</u>: United Nations, <u>Commodity Trade Statistics</u>, Series D, 1983 and 1984; <u>Industrial Statistics</u> <u>Yearbook</u>, 1984 and 1985.

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ISIC	Indonesia	Malaysia	Philippines	Singapore	Thailand	Rest of the world	Total
3	68,40	9675,80	194.81	803.42	234.07	9395.61	20372.11
312	23.10	2534.50	10.76	41.92	173.53	611.44	3395.26
313	0.00	228.34	* 0.11	4.57	0.00	51.01	284.03
314	1.07	422.02	0.00	0.00	0.00	19.22	442.31
321	3.00	363.25	0.41	15.96	8.41	285.06	676.10
322	1.44	17.85	1.33	6.18	3.46	34.34	64.61
323	0.00	6.94	0.00	0.84	0.68	9.33	17.79
324	0.00	4.98	0.00	0.61	0.00.	11.23	16.82
331	8.79	265.30	0.21	10.19	0.37	8.36	293.23
332	0.00	72.34	0.00	2.71	0.42	16.42	91.90
341	5.75	137.97	0.73	8.74	1.40	221.85	376.43
342	0.25	392.04	0.00	13.41	0.30	42.76	448.75
351	11.38	915.59	0.74	74.08	6.95	767.34	1776.07
352	2.94	325.45	3.93	20.92	4.66	237.68	595.59
355	0.00	1168.46	0.00	1.86	0.48	47.69	1218.50
356	0.00	203.91	0.52	12.22	0.63	59.68	276.96
361	0.00	12.55	0.00	0.00	0.00	37.59	50.14
362	2.07	56.13	0.67	4.68	0.67	44.37	108.59
369	1.62	587.40	0.16	25.13	6.22	113.00	733.53
371	0.00	540.61	0,45	18.88	0.32	689.15	1249.42
381	0.00	492.11	0.91	33.46	4.49	385.47	916.43
382	0.21	132.21	2.24	65.54	4.38	1745.38	1949.96
383	6.61	384.30	170.92	332.16	14.32	2347.48	3255.80
384	0.00	367.70	0.29	85.97	1.09	1236.25	1691.30
385	0.00	3.76	0.23	12.62	0.41	264.68	281.71
390	0.18	40.09	0.21	10.76	0.88	108.82	160.93

Production and Imports of Malaysia, 1983-84 (US\$ millions)

Table 5.19b

Sources: United Nations, <u>Commodity Trade Statistics</u>, Series D, 1983 and 1984; <u>Industrial Statistics</u> <u>Yearbook</u>, 1984 and 1985.

UNIDO, Consolidated Industrial Statistics Data.

ISIC	Indonesia	Malaysia	Philippines	Singapore	Thailand	Rest of the world	Total
3	18.04	28.43	8335.47	49.24	20.19	3369.82	11821.20
312	0.73	14.22	2021.05	2.82	11.33	253.16	2303.32
313	0.00	0.00	764.70	0.00	0.00	54.04	818.74
314	0.00	0.00	642.84	0.00	0.00	3.90	646.74
321	0.00	1.65	649.80	0.35	0.38	173.69	825.88
322	0,00	0.25	29.52	0.43	0.00	4.07	34.27
323	0.00	0.00	8.57	0.00	0.00	11.94	20.52
324	0.00	0.00	13.95	0.00	0.00	2.96	16.91
331	0.00	0.00	106.31	0.00	0.00	1.08	107.38
332	0,00	0.00	4.90	0.00	0.00	0.94	5.84
341	0,33	0.00	344.47	0.09	0.52	102.19	447.61
342	0.00	0.00	137.21	0.45	0.00	19.11	156.77
351	16.37	1.19	372.28	11.35	0.26	655.60	1057.05
352	0.36	0.00	876.64	1.81	0.85	154.51	1034.17
355	0.00	0.56	179.59	0.80	0.21	30.78	212.04
356	0.12	0.66	152.75	0.56	0.00	10.76	164.84
361	0.00	0.00	14.54	0.00	0.00	5.36	19.91
362	0.00	0.00	106.65	0.16	0.10	12.01	118.92
369	0.00	0.00	91.47	0.31	0.21	17.47	109.46
371	0.00	0.06	730.49	1.32	0.00	307.67	1039.53
381	0.00	0.74	237.91	3.12	1.44	144.55	387.76
382	0.14	1.82	75.94	11.16	0.47	572.65	662.18
383	0.00	6.48	432.52	8.74	4.40	432.54	884.67
384	0.00	0.14	338.77	4.13	0.00	300.67	643.71
385	0.00	0.54	2.60	1.65	0.00	68.10	72.90
390	0.00	0.00	0.00	0.00	0.00	30.07	30.07

### Production and Imports of the Philippines, 1983-84 (US\$ millions)

Table 5.19c

<u>Sources</u>: United Nations, <u>Commodity Trade Statistics</u>, Series D, 1983 and 1984; <u>Industrial Statistics</u> <u>Yearbook</u>, 1984 and 1985. UNIDO, Consolidated Industrial Statistics Data.

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ISIC	Indonesia	Malaysia	Philippines	Singapore	Thailand	Rest of the world	Total
3	444.10	1642.14	110.28	5029.04	339.04	14838.71	22403.31
312	44.75	503.67	26.64	282.70	118.93	742.71	1719.40
313	0.00	9.44	0.00	101.97	0.13	89.75	201.29
314	2 47	0.29	0.00	50.32	0.00	76.09	129.17
321	22 97	61 04	0.76	107.80	31.33	851.54	1075.45
322	10 39	81 84	2 68	142.16	19 64	180 90	437 62
323	0.22	2 12	0.00	6 60	3 39	70 69	83 03
324	0.68	4 73	0 13	18 75	0.85	66 54	91 69
121	96 95	121 02	0.47	114 67	1 23	21 04	355 38
332	0.59	6 18	0.35	85.17	4.50	73 15	169.95
341	8.35	9.22	0.05	69.21	2.27	249.30	338.40
342	0.06	4.38	0.34	354.03	0.68	86.89	446.38
351	10.61	31.56	0.86	250.28	5.20	953.42	1251.93
352	29.83	30.31	1.68	150.78	7.32	392.11	612.03
355	0.06	11.13	0.33	188.41	6.07	118.05	324.04
356	0.18	15.01	0.25	165.23	4.53	127.16	312.34
361	0.00	5.63	0.51	1.64	0.82	89.58	98.18
362	4.31	10.17	1.59	14.46	2.22	96.67	129.42
369	2.44	17.89	4.00	489.87	3.51	309.00	826.72
371	0.00	10.75	0.06	63.56	5.91	861.27	941.56
381	1 14	29 04	1 30	654.68	5.59	596 44	1288.18
382	41 78	98 37	20 35	693.47	26.06	2687 09	3567.12
383	140 92	540 27	44.82	513.60	85.27	3151.32	4476.20
384	0.80	18 97	1 02	345.11	1 27	1987 90	2355 06
385	1 52	11 99	1 65	100 18	1 22	670 13	786 68
390	23.07	7.12	0.45	64.38	1.09 -	289.97	386.08

#### Production and Imports of Singapore, 1983-84 (US\$ millions)

Table 5.19d

Sources: United Nations, <u>Commodity Trade Statistics</u>, Series D, 1983 and 1984; <u>Industrial Statistics</u> <u>Yearbook</u>, 1984 and 1985.

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UNIDO, Consolidated Industrial Statistics Data.

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Production	and	Imports	of	Thailand,	1983-84
		(US\$ mil	lio	ns)	

Table 5.19e

ISIC	Indonesia	Malaysia	Philippines	Singapore	Thailand	Rest of the world	Total
3	24.87	96.46	13.81	159.33	26028.02	6353.36	32675.84
312	0.92	25.90	1.06	10,92	5946.15	245.14	6230.10
313	0.00	0.00	0.00		1176.14	41.65	1217.79
314	0.00	0.00	0.00	0.80	846.25	3.31	850.37
321	1.52	3.50	0.15	0.27	2864.43	236.19	3106.07
322	0.00	0.26	0.00	0.00	1751.13	9.06	1760.45
323	0.00	0.00	0.00	0.00	36.26	3.26	39.52
324	0.00	0.00	0.00	0.00	102.30	3.14	105.44
331	17.95	44.46	0.00	0.50	367.20	6.37	436.48
332	0.00	0.00	0.00	0.00	329.26	5.48	334.74
341	0.10	0,29	0.00	4.99	1015.31	163.02	1183.73
342	0.00	0.06	0.00	1.12	212.16	19.22	232.57
351	3.42	4.01	1.04	28.75	597.92	1160.08	1735.22
352	0.45	1.12	1.91	7.50	1155.89	250.69	1417.57
355	0.00	0.97	0.00	1.16	861.68	73.33	937.14
356	0.00	0.66	0.57	1.59	354.72	40.00	397.53
361	0.00	0.00	0.00	0.00	74.32	21.39	95.71
362	0.16	0.27	0.00	1.59	257.32	26.73	286.07
369	0.00	0.06	0.00	0.30	798.17	27.48	826.01
371	0.00	0.25	0.13	0.60	766.00	643.71	1410.68
381	0.00	2.41	0.19	6.93	614.01	254.74	878.27
382	0.11	3.09	4.63	21.96	706.62	1274.61	2011.02
383	0,06	8.03	2.50	62.69	769.22	801.55	1644.06
384	0.00	0.09	1.49	3.86	3064.93	766.51	3836.88
385	0.17	0.17	0.14	3.79	87.45	174.09	265.81
390	0.00	0.86	0.00	0.00	1273.19	162.58	1436.63

<u>Sources</u>: United Nations, <u>Commodity Trade Statistics</u>, Series D, 1983 and 1984; <u>Industrial Statistics</u> <u>Yearbook</u>, 1984 and 1985. UNIDO, Consolidated Industrial Statistics Data.

ISIC	Indonesia	Malaysia	Philippines	Singapore	Thailand	Rest of the world	Total
	·						
3	2212.16	5867.24	2730.53	12990.28	3801.87	2995726.69	3023328.78
312	828,25	2249.04	1293,92	1063.97	1829.34	382592.49	389848.00
313	0.35	2.07	3.02	57.58	1.58	67852.44	67917.03
314	7.07	0.50	2.38	45.23	1.37	34135.81	34192.37
321	146.59	124.05	43.83	412.61	361.36	115020.91	116109.35
322	237.44	191.66	308.67	561.96	505.50	55004.89	56810.13
323	7.69	1.64	8.07	25.52	46.38	9405.77	9495.07
324	3,30	15.17	55.68	21.19	86.46	12181.55	12363.36
331	817.92	579.09	305.33	447.48	69.88	54960.65	57180.34
332	4.69	5.16	94.26	88.93	42.92	35789.96	36025.91
341	2.88	3.72	13.59	112.06	5.36	107698.83	107836.43
342	0.00	3,22	0.14	67.08	1.64	118224.75	118296.83
351	51,40	91.54	90.17	787.77	40.08	179199.07	180260.04
352	39.14	19.94	4.24	242.25	11.89	139165.06	139482.51
355	1.73	34,15	1.47	57.66	28.43	35352.58	35476.02
356	0.31	13.74	11.65	77.02	48.46	79846.49	79997.67
361	0.00	4.28	5.25	6.58	2.75	6967.86	6986.71
362	4.38	7.95	2.58	46.96	10.81	22183.72	22256.39
369	7.13	4.70	6.25	53.89	20,12	73964.62	74056.70
371	9.56	13.07	33.61	206.15	27.73	156292.12	156582.23
381	1.27	46.39	10.63	261.89	43.81	173263.13	173627.12
382	3.19	119.26	33.52	2570.86	67.20	323050 57	325844 60
183	1.68	2005.31	117.24	3970.79	386 43	324068.89	330550.33
184	10.92	251.26	23.05	1187.90	19.50	399776.76	401269.39
185	0 71	57 64	9.03	370.98	46 05	53558 60	54043 00
190	24 58	31.69	252.96	245 99	96 84	36169 19	36821 24

Table 5.19f

### Production and Imports of the Rest of the World, 1983-84 (US\$ million^)

<u>Sources</u>: United Nations, <u>Commodity Trade Statistics</u>, Series D, 1983 and 1984; <u>Industrial Statistics</u> <u>Yearbook</u>, 1984 and 1985. UNIDO, Consolidated Industrial Statistics Data.

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Trade	Creation	and Trade	Diversion
	(US\$	millions)	

	Indonesia			Kalaysia		Philippines			Singapore			Thailand			
ISIC	Trade creatior	Trade diver- sion	Net	Trade	Trade diver sion	- Net	Trade creation	Trade diver sion	- Net	Trade creation	Trade diver n sion	- Net	Trade creation	Trade diver n sion	- Net
Total	1.394	1.771	-0.376	1.489	0.861	0.628	0.239	0.160	0.079	0.071	-0.018	0.089	1.235	0.344	0.891
311/3	12 0.752	0.489	0.263	0.400	0.005	0.395	0.149	-0.001	0.150	0.002	-0.003	0.004	0.650	-0.042	0.692
321	0.010	0.010	0.001	0.046	0.051	-0.004	0.007	0.003	0.004	0.000	-0.000	0.000	0.054	-0.004	0.057
322	0.002	0.001	0.002	0.044	0.013	0.032	0.004	-0.000	0.004	0.013	-0.009	0.021	0.004	0.000	0.004
323	0.000	0.000	0.000	0.004	0,001	0.003	-0.000	0.000	-0.000	0.000	-0.000	0.000	-0.000	0.000	-0.000
324	0.003	-0.000	0.004	0.002	0.001	0.001	0.000	-0.000	0.000	0.000	0.000	0.000	0.000	-0.000	0.000
331	0.001	0.000	0.001	0.028	0.000	0.028	-0.000	0.000	-0.000	0.000	0.000	0.000	0.154	0.002	0.152
332	0.005	0.004	0.001	0.014	0.001	0.012	-0.000	0.000	-0.000	0.001	-0.002	0.003	-0.000	0.000	-0.000
341	0,005	0.037	-0.032	0.010	0.010	-0.000	0.001	0.003	-0.005	0.000	0.000	0.000	0.018	0.014	0.004
342	0.002	0.001	0.001	0.010	0,002	0.008	0.001	0.001	0.000	0.000	0.000	0.000	0.002	0.001	0.001
351	0.107	0.124	-0.017	0.094	0.007	0.087	0.024	0.017	0.037	0.032	0.035	-0.002	0.077	0.097	-0.020
352	0.009	0.013	-0.004	0.012	0.012	0.000	0.003	0.005	-0.003	0.000	0.000	0.000	0.045	0.035	0.010
355	0.023	-0.001	0.023	0.027	-0.000	0.027	0.004	-0.000	0.004	0.000	0.000	0.000	0.015	-0.001	0.016
356	0.011	0.002	0.009	0.053	0.020	0.033	0.005	0.001	0.005	0.001	-0.001	0.002	0.031	0.005	0.026
361	-0.000	0.000	-0,000	-0.000	0.000	-0,000	-0.000	0.000	-0.000	0.000	0,000	0.000	-0.000	0.000	-0.000
362	0.013	0.007	0.005	0.015	0.012	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.015	0.002	0.013
369	0.078	0.021	0.057	0.085	0.019	0.066	0.001	0.001	0.000	0.000	0.000	0.000	0.002	0.000	0.002
371	0.012	0.063	-0.051	0.004	0.010	-0.006	0.001	0.002	-0.001	0.000	0.000	0.000	0.001	0.002	-0.001
381	0.103	0.231	-0.128	0.041	0.032	0.009	0.009	0.013	-0.004	0.000	-0.000	0.000	0.025	0.020	0.005
382	-0.003	0.274	-0.277	-0.005	0,032	-0.037	-0.004	0.088	-0.091	0.020	-0.035	0.055	0.010	0.065	-0.055
383	0.067	0.163	-0,096	0.512	0.519	-0.007	0.026	0.026	0.000	0.000	-0.000	0.001	0.104	0.142	-0.038
384	0.192	0.298	-0.106	0.092	0.106	-0.014	0.008	-0.001	0.009	0.002	-0.003	0.004	0.034	-0.030	0.064
385	0.001	0.025	-0.024	0.000	0.003	-0.003	0.000	0.003	-0.003	0.000	0.000	0.000	0.009	0.002	0.008
390	-0.000	0.007	-0.007	0.001	0.005	-0.005	-0,000	0.000	-0.000	0.000	-0.000	0.001	-0.013	0.033	-0,045

#### Table 5.21a

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		Im	ports		D	
ISIC	Production domestic consumption (%)	ASEAN (%)	Rest of the world (%)	Increase in intra-ASEAN imports (US\$m)	imports from the rest of the world (US\$m)	
Total manufactures <sup>*</sup>	-0.36	9.98	-0.14	69.19	14.64	
yhat-Link	2.91	13.95	1.78	96.68	-180.35	
yhat05	2.66	15.20	2.48	105.37	-250.93	
yhat02	0.85	12.07	0.91	83.66	-91.59	
eta=2, y=.05	6.72	23.15	7.62	160.48	-771.30	
eta	1.41	13.27	1.80	92.01	-181.84	
eta-2, yhat02	2.47	15.25	2.96	105.70	-299.73	
eps5	-0.34	10.01	-0.07	69.41	7.49	
eps=3	-0.23	10.18	0.02	70.60	-2.39	
sigma-3	-0.55	14.50	-0.23	100.50	23.22	
gamma-2	-0.37	10.42	-0.16	72.25	16.39	
gamma-10	-0.35	11.02	-0.24	76.41	24.18	
gamma2	-0.34	8.96	-0.15	62.13	14.76	
non discriminatory	-1.71	6.93	3.22	48.05	-325.97	
$\Delta tariff=0$ , what=.05	3.01	5.22	2.62	36.18	-265.56	

#### Changes in Imports and Production for Domestic Consumption, Indonesia (with a 20% reduction in tariffs under various scenarios)

NOTE:

a. Total manufactures is the aggregate value for all manufactures shown in Table 5.18 of Appendix E. All of the sensitivity analyses were run using the aggregate figures.

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#### Table 5.21b

		Χm	ports		Deereese fo	
ISIC	Production domestic consumption (%)	ASEAN (Z)	Rest of the world (%)	Increase in intra-ASEAN imports (US\$m)	imports from the rest of the world (US\$m)	
Total manufactures <sup>a</sup>	-0.80	9.99	-0.31	129.99	28.99	
yhat-Link	5.10	15.99	3.63	207.98	-340.68	
yhat=.05	3.85	15.29	2.51	198.94	-236.01	
yhat=.02	1.06	12.11	0.82	157.57	-77.01	
eta-2, y=.05	8.65	20.19	5.03	262.63	-472.98	
eta=.5, yhat=.05	1.56	12.54	1.03	163.15	-96.50	
eta=2, yhat=.02	2.98	14.07	1.83	183.04	-171.80	
eps=.5	-0.78	10.03	-0.24	130.51	22.26	
ep:s=3	-0.47	10.49	0.12	136.46	-11.13	
signa=3	-1.29	14.61	-0.45	190.03	42.08	
gama-2	-0.76	10.32	-0.38	134.23	35.26	
gamma-10	-0.67	10.77	-0.52	140.12	48.52	
gamma=.2	-0.91	9.24	-0.21	120.25	19.36	
non discriminatory	-2.59	7.50	3.62	97.56	-339.96	
∆tariff-0, yhat05	4.65	5.30	2.82	68.96	-265.00	

#### Changes in Imports and Production for Domestic Consumption, Malaysia (with a 20% reduction in tariffs under various scenarios)

NOTE:

a. Total manufactures is the aggregate value for all manufactures shown in Table 5.18 of Appendix E. All of the sensitivity analyses were run using the aggregate figures.

#### Table 5.21c

		Im	ports		Decrease in	
ISIC	Production domestic consumption (%)	ASEAN (%)	Rest of the world (%)	Increase in intra-ASEAN imports (US\$m)	imports from the rest of the world (US\$m)	
Total manufactures <sup>*</sup>	-0.09	8.86	-0.12	10.27	-4.13	
yhat=Link	3.17	11.27	0.68	13.06	-22.98	
yhat=.05	2.47	11.33	0.49	13.13	-16.62	
yhat 02	0.93	9.85	0.27	11.41	-9.13	
eta=2, y=.05	6.04	16.14	3.23 👂	18.70	-108.87	
eta=.5, yhat=.05	1.44	10.68	0.90	12.38	-30.31	
eta=2, yhat=.02	2.36	11.77	1.37	13.64	-46.03	
eps=.5	-0.10	8.81	0.11	10.21	-3.69	
ера=3	-0.05	8.72	-0.04	10.10	1.21	
sigma-3	-0.15	12.98	0.17	15.05	-5.82	
gamma-2	-0.10	9.15	0.12	10.61	-3.92	
gamma-10	-0.08	9.54	0.03	11.06	-0.89	
gamma2	-0.08	8.12	0.03	9.42	-0.92	
non discriminatory	-0.61	8.91	4.39	10.33	-148.05	
Atariff=0, yhat=.05	2.56	2.46	0.37	2.85	-12.50	

#### Changes in Imports and Production for Domestic Consumption, Philippines (with a 20% reduction in tariffs under various scenarios)

NOTE:

a. Total manufactures is the aggregate value for all manufactures shown in Table 5.18 of Appendix E. All of the sensitivity analyses were run using the aggregate figures.

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# Table 5.21d

	Imports				Deerosse fr
ISIC	Production domestic consumption (%)	ASEAN (%)	Rest of the world (%)	Increase in intra-ASEAN imports (US\$m)	imports from the rest of the world (US\$m)
Total manufactures*	-2.18	6.53	0.30	165.62	-44.16
yhat-Link	9,30	17.63	9.00	447.02	-1334.98
yhat=.05	4.18	11.76	3.27	298.11	-485.56
yhat=.02	0.37	8.62	1.13	218.61	-167.73
eta=2, y=.05	10.77	16.77	6.71	425.27	-995.08
eta=.5, yhat=.05	1.06	9.09	1.45	230.53	-215.65
eta-2, yhat02	3.00	10.63	2.50	269.48	-371.54
eps=.5	-2.12	6,60	-0.19	167.39	28.00
eps=3	-1,78	6.90	0.10	175.02	-14.94
sigma-3	-3,78	9.84	-0.33	249.51	48.92
gamma-2	-1.69	6.48	-0.43	164.20	64.37
gamma-10	-1.02	6.45	-0.64	163.67	95.61
gamma2	-3,31	6.70	-0.01	169.89	1.13
non discriminatory	-3.41	6.03	0.58	152.88	-86.57
Atariff-0, vhat05	6.36	5.23	3.57	132.49	-529.72

#### Changes in Imports and Production for Domestic Consumption, Singapore (with a 20% reduction in tariffs under various scenarios)

NOTE:

a. Total manufactures is the aggregate value for all manufactures shown in Table 5.18 of Appendix E. All of the sensitivity analyses were run using the aggregate figures.

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Changes in	Imports	and Produ	uction for	Domestic	Consumption,	Thailand
(with	a 20% :	reduction	in tariff	s under va	rious scenari	.os)

		Im	ports		Deemoore fr
ISIC	Production domestic consumption (%)	ASEAN (%)	Rest of the world (%)	Increase in intra-ASEAN imports (US\$m)	Decrease in imports from the rest of the world (US\$m)
Total manufactures <sup>*</sup>	-0.13	12.00	0.19	35,34	-11.78
vhat-Link	3.64	16.52	2.63	48.64	-167.29
yhat05	2.27	14.37	0.31	42.32	-19.69
yhat02	0.83	12.95	0.24	38.14	-14.94
eta=2, y=.05	5.17	17.70	1.23	52.11	-78.37
eta=.5, yhat=.05	1.19	13.43	0.45	39.54	-28.43
eta=2, yhat=.02	1.99	14.28	0.60	42.05	-38.41
eps=.5	-0.14	11.94	0.17	35.17	-10.85
eps-3	-0.12	11.74	-0.05	34.58	3.15
sigma-3	-0.22	17.66	0.31	52.01	-19.66
gamma-2	-0.11	12.35	0.16	36.37	-10.05
gamma-10	-0.08	12.80	0.04	37.68	-2.48
gamma2	-0.16	11.08	0.10	32.63	-6.11
non discriminatory	-0.58	12.20	7.91	35.93	-502.36
$\Delta tariff=0$ , what=.05	2.40	2.37	0.12	6.98	-7.91

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NOTE:

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a. Total manufactures is the aggregate value for all manufactures shown in Table 5.18 of Appendix E. All of the sensitivity analyses were run using the aggregate figures.

# Table 5.22

	Total exports					Exp	orts to A	SEAN		
Scenario	Indo- nesia (%)	Malay- sia (%)	Philip- pines (X)	Singa- pore (%)	Thai- land (%)	Indo- nesia (%)	Malay- sia (%)	Philip- pines (%)	Singa- pore (%)	Thai- land (%)
Total manufacture	sª 1.51	1.43	1.05	-0.53	1.27	7.64	6.99	9.73	9.59	8,85
vhat=Link	0.89	2.03	0.39	-2.03	-0.21	17.01	17.48	17.92	14.78	16.27
vhat=.05	1.89	3.43	2.84	1.78	3.34	11.24	12.13	14.86	14.77	14.21
vhat=.02	1.66	2.23	1.77	0.39	2.10	9.08	9.04	11.79	11.66	10.99
eta=2, y=.05	0.33	5.44	2.76	4.02	4.68	13.35	17.75	18.62	21.14	19.57
eta	1.21	2.43	1.48	0.61	2.12	9.06	9.68	11.95	12.48	11.53
eta-2, yhat02	1.04	3.03	1.74	1.29	2.63	9.92	11.29	13.29	14.21	13.14
eps=.5	1.38	1.32	0.96	-0.67	1.20	7.68	7.04	9.82	9.60	8.94
eps=3	1.33	1.22	1.06	-0.74	1.35	7.95	7.24	10.30	9.84	9.45
sigma=3	2.24	2.02	1.53	-1.46	1.82	11.55	10.48	14.64	13.77	13.28
gamma-2	1.48	1.50	1.03	0.08	1.30	7.52	6.98	9.65	10.17	8.81
gamma-10	1.47	1.62	1.04	0.87	1.34	7.43	7.01	9.59	10.94	8.79
gamma2	1.48	1.19	1.08	-2.05	1.27	7.89	7.03	9.99	8.21	9.09
non discriminator	y 4.71	3.53	2.60	1.19	2.55	8.04	6.48	7.53	7.22	6.66
Atariff=0, yhat=.	05 0.39	2.00	1.79	2.31	2.07	3.61	5.14	5.13	5.18	5.35

Change in Exports (with a 20% reduction in tariffs under various scenarios)

NOTE:

a. Total manufactures is the aggregate value for all manufactures shown in Table 5.18 of Appendix E. All of the sensitivity analyses were run using the aggregate figures.

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#### Table 5.23

Scenario	Indonesia (%)	Malaysia (%)	Philippines (%)	Singapore (%)	Thailand (%)
Total manufactures	• 0.01	0.19	0.22	-0.95	0.08
vhat-Link	2.51	3.74	2.42	0.89	3.07
vhat=.05	2.51	3.66	2.57	2.40	2.43
vhat=.02	1.01	1.58	1.16	0.39	1.02
eta=2, v=.05	5.45	7.22	5.16	5.76	5.09
eta=.5, $yhat=.05$	1.37	1.95	1.45	0.73	1.33
eta=2, $vhat=.02$	2.19	3.00	2.19	1.73	2.08
eps=.5	0.00	0.15	0.19	-1.04	0.05
eps=3	0.08	0.28	0.25	-1.01	0.09
sigma=3	0.00	0.18	0.30	-2.06	0.08
gamma=2	0.00	0.25	0.21	-0.38	0.09
gamma=10	0.01	0.34	0.22	0.39	0.13
gamma. 2	0.02	0.02	0.23	-2.37	0.05
non discriminatory	-0.43	0.12	0.25	0.01	-0.11
∆tariff=0, yhat=.0	5 2.49 ~ .	3.48	2.35	3.35	2.35

# Change in Production (with a 20% reduction in tariffs under various scenarios)

NOTE:

a. Total manufactures is the aggregate value for all manufactures shown in Table 5.18 of Appendix E. All of the sensitivity analyses were run using the aggregate figures.

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		Imp	ports		
ISIC	Production domestic consumption (%)	ASEAN (%)	Rest of the world (%)	Increase in intra-ASEAN imports (US\$m)	imports from the rest of the world (US\$m)
Total manufactures"	-0,91	21.36	-0.14	148.03	14.28
yhat-Link	15.80	41.80	10.96	2.89.76	-1109.23
yhat=.05	14.76	53.90	13.88	373.64	-1403.97
yhat02	5,17	33.79	5.24	234.26	-529.83
eta=2, y=.05	38.22	115.26	46.57	798.98	-4712.27
eta=.5, yhat=.05	8.09	41.44	9.99	287.27	-1011.21
eta-2, yhat02	13.73	54.53	16.54	378.02	-1673.54
eps5	-0,88	21.41	0.02	148.42	-1.88
eps-3	-0.67	21.57	-0.03	149.53	3.30
sigma-3	-1.49	31.63	-0.18	219.25	17.82
gamma-2	-0,90	22.65	-0.23	157.01	23.30
gamma-10	-0,81	24.46	-0.48	169.59	48.92
gamma2	-0,92	18.44	-0.09	127.80	9.12
non discriminatory	-3,36	16.00	6.07	110.88	-614.33
$\Delta tariff=0, yhat=.05$	15.84	28.29	14.07	196.10	-1423.12

## Changes in Imports and Production for Domestic Consumption, Indonesia (with a 50% reduction in tariffs under various scenarios)

NOTE:

a. Total manufactures is the aggregate value for all manufactures shown in Table 5.18 of Appendix E. All of the sensitivity analyses were run using the aggregate figures.

# Table 5.24b

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(with a 50% reduction in tariffs under various scenarios)	-

		Im	ports			
ISIC	Production domestic consulption (%)	ASEAN (%)	Rest of the world (%)	Increase in intra-ASEAN imports (US\$m)	Decrease in imports from the rest of the world (US\$m)	
Total manufactures <sup>*</sup>	-2.24	29.31	-0.99	381.28	92.77	
yhat=Link	29.07	66.81	21.85	869.04	-2053.17	
yhat	22.36	64.41	14.09	837.74	-1323.87	
yhat =. 02	7.15	42.66	4.77	554.94	-448.48	
eta=2, y=.05	51,66	101.62	30.03	1321.74	-2821.47	
eta=.5, yhat=.05	9.77	45.44	5.90	591.02	-554.34	
eta=2, yhat=.02	17.43	55.72	10.29	724.72	-967.12	
eps=.5	-2.16	29.47	-0.77	383.31	72.45	
eps=3	-1,22	31.27	0.39	406.76	-36,42	
sigma-3	-3.75	44.67	-1.52	580,98	142.56	
gamma-2	-2.14	30.35	-1.17	394.82	109.79	
gamma=10	-1.94	31.83	-1.55	414.04	145.60	
gamma2	-2.48	27.03	-0.71	351.52	66.79	
non discriminatory	-7.11	20.58	10.14	267.70	-953.05	
Atariff=0, yhat=.05	25.14	28.98	15.21	376.97	-1429.23	

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NOTE:

a. Total manufactures is the aggregate value for all manufactures shown in Table 5.18 of Appendix E. All of the sensitivity analyses were run using the aggregate figures.

# Table 5.24c

		Imj	ports	Increase in intra-ASEAN imports (US\$m)	Decrease in imports from the rest of the world (US\$m)
ISIC	Production domestic consumption (%)	ASEAN (%)	Rest of the world (%)		
Total manufactures <sup>a</sup>					
yhatLink	16.78	30.63	4.64	35.50	-156.44
yhat=.05	13.13	32.89	2.48	38.13	-83.72
yhat=.02	4.97	24.40	1.19	28.28	-40.18
eta-2, y05	33,75	64.64	18.63	74.92	-627.83
eta=.5, yhat=.05	7,63	29.39	4.47	34.06	-150.48
eta=2, yhat=.02	12.55	36.02	7.05	41.74	-237.66
eps=.5	-0.25	18.64	0.38	21.60	-12.92
eps-3	-0.15	18.23	-0.13	21.13	4.32
sigma-3	-0.40	28.12	0.66	32.59	-22.25
gamma-2	-0.24	19.67	0.37	22.79	-12.64
gamma-10	-0.19	20.82	0.11	24.13	-3.78
gamma2	-0.21	16.69	0.19	19.35	-6.45
non discriminatory	-1.16	20.26	8.08	23.48	-272.35
∆tariff=0, yhat05	13.37	12.49	2.05	14.48	-69.02

## Changes in Imports and Production for Domestic Consumption, Philippines (with a 50% reduction in tariffs under various scenarios)

NOTE:

a. Total manufactures is the aggregate value for all manufactures shown in Table 5.18 of Appendix E. All of the sensitivity analyses were run using the aggregate figures.

Table 5	.24d
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		Im	ports		
ISIC	Production domestic consumption (%)	ASEAN (%)	Rest of the world (%)	Increase in intra-ASEAN imports (US\$m)	Decrease in imports from the rest of the world (US\$m)
Total manufactures*	-5.72	17.94	-0.89	454.87	132.17
yhat-Link	57.61	94.99	56.72	2408.64	-8416.42
vhat05	27,62	50.54	18.43	1281.42	-2734.27
yhat02	6,84	30.31	6.47	768.42	-959.46
eta=2, y=.05	69,15	87.10	40.38	2208.46	-5991.34
eta=.5, yhat=.05	10,44	33.19	8.21	841.60	-1218.71
eta-2, yhat02	20,92	42.97	14.04	1089.44	-2083.16
eps=.5	-5.55	18.18	-0.57	460,95	84.92
eps=3	-4,60	19.22	0.30	487.27	-45.26
sigma-3	-10.01	27.71	-1.11	702.69	164.89
gamma=2	-4,49	17.79	-1.24	451.19	183.33
gamma-10	-2.76	17.75	-1.78	449.96	264.22
gamna2	-8.49	18.38	-0.19	466.14	27.50
non discriminatory	-8,98	15.88	1.61	402.67	-238.17
∆tariff=0, yhat=.05	35.12	28.64	19.36	726.13	-2872,18

# Changes in Imports and Production for Domestic Consumption, Singapore (with a 50% reduction in tariffs under various scenarios)

NOTE:

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a. Total manufactures is the aggregate value for all manufactures shown in Table 5.18 of Appendix E. All of the sensitivity analyses were run using the aggregate figures.

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## Table 5.24e

### Changes in Imports and Production for Domestic Consumption, Thailand (with a 50% reduction in tariffs under various scenarios)

		Im	ports		
ISIC	Production domestic consumption (%)	ASEAN (%)	Rest of the world (%)	Increase in intra-ASEAN imports (US\$m)	Decrease in imports from the rest of the world (US\$m)
Total manufactures	-0.38	36.64	0.52	107.90	-32.76
yhat-Link	19.57	64.79	15.28	190.78	-970.91
yhat05	12.11	51.67	1.42	152.14	-90.43
yhat02	4.48	42.65	0.82	125.59	-52.40
eta=2, y=.05	28.71	74.15	7.37	218.35	-468.42
eta=.5, yhat=.05	6.38	45.75	1.95	134.72	-123.80
eta=2, yhat=.02	10.59	51.30	2.90	151.07	-184.06
eps=.5	-0.42	36.41	0.46	107.20	-29.43
eps≖3	-0.35	35.69	-0.14	105.11	8.67
sigma-3	-0.68	57.16	0.91	168.31	-57.87
garina=2	-0.33	37.78	0.43	111.26	-27.20
gamma-10	-0.25	39.28	0.09	115.67	-5.62
gamma2	-0.45	33.72	0.32	99.28	-20.17
non discriminatory	-1.69	36.53	23.62	107.58	-1500.93
Atariff-0, vhat05	12.55	11.90	0.85	35.05	-53.82

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NOTE:

a. Total manufactures is the aggregate value for all manufactures shown in Table 5.18 of Appendix E. All of the sensitivity analyses were run using the aggregate figures.

Tab]	le 5	.25
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Change in Exports (with a 50% reduction in tariffs under various scenarios)

		Total exports				Exports to ASEAN				
Indones Scenario (X	Indo- nesia (%)	Malay- sia (%)	Philip- pines (%)	Singa- pore (%)	Thai- land (%)	Indo- nesia (%)	Malay- sia (%)	Philip- pines (%)	Singa- pore (%)	Thai- land (%)
Total manufacture	s <sup>a</sup> 4.03	4.00	1.88	-1.28	3.44	21.11	19.16	27.89	25.32	24.01
vhat=Link	5,39	11.44	1.63	-10.77	-1.45	86.72	91.47	85.98	54.21	74.55
yhat=.05	6.76	15.26	13.08	10.18	15.22	43.41	51.14	62.18	58.21	59.06
yhat=.02	5.07	8.40	6.89	3.31	7.98	29.70	31.33	40.82	37.93	37.20
eta=2, y=.05	-0.22	27.73	13.11	21.47	24.23	56.74	92.29	90.49	105.92	101.09
eta=.5, yhat=.05	2.85	9.55	5.43	4.41	8.19	29.55	35.26	41.88	43.11	40.65
eta=2, yhat=.02	2.17	13.00	6.92	7.82	11.18	34.76	45.59	50.78	54.52	51.43
eps=.5	3.71	3.69	2.73	-1.68	3.24	21.28	19.33	28.17	25.35	24.32
eps=3	3.84	3.36	3.11	-1.87	3.71	22.53	19.93	30.06	26.12	26.06
sigma-3	6.11	5.84	4.53	-3.61	5.11	33.03	29.62	44.03	37.39	37.52
gamma-2	4.04	4.17	2.95	0.29	3.51	20.88	19.12	27.65	27.11	23.88
gamma-10	4.08	4.45	2.98	2.38	3.64	20.69	19.19	27.50	29.56	23.86
gamma=.2	3.91	3.43	3.05	-5.04	3.44	21.72	19.27	28.64	21.18	24.67
non discriminator	y 10.22	9.69	5.89	3.03	6.97	19.49	17.78	19.62	18.94	17.90
$\Delta tariff=0, yhat=.$	050.39	2,00	1.79	2.31	2.07	3.61	5.14	5.13	5.18	5.35

NOTE:

a. Total manufactures is the aggregate value for all manufactures shown in Table 5.18 of Appendix E. All of the sensitivity analyses were run using the aggregate figures.

Table	5.	26
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Scenario	Indonesia (%)	Malaysia (%)	Philippines (%)	Singapore (%)	Thailand (%)
Total manufactures	-0.09	0.53	0.64	-2.43	0.18
yhat-Link	13.74	21.26	12.70	6.85	16.46
yhat05	13.17	19.21	13.12	14.67	12.57
yhat02	5.15	7.71	5.49	4.22	5.00
eta=2, y=.05	30.59	41.05	28.20	33.75	28.05
eta=.5, yhat=.05	7.05	9.67	7.04	5.96	6.64
eta-2, yhat02	11.44	15.46	11.03	11.20	10.68
eps=.5	0.03	0.43	0.55	-2.68	0.12
eps-3	0.23	0.81	0.73	-2.57	0.25
sigma=3	0.02	0.50	0.93	-5.26	0.18
gamma-2	0.08	0.66	0.62	-0.95	0.24
gamma-10	0.16	0.89	0.66	1.06	0.32
gamma2	0.04	0.14	0.67	-5.93	0.13
non discriminatory	-0.66	0.34	0.74	-0.06	-0.42
$\Delta tariff=0, yhat=.0$	5 2.49	3.48	2.35	3.35	2.35

Change in Production (with a 50% reduction in tariffs under various scenarios)

NOTE:

a. Total manufactures is the aggregate value for all manufactures shown in Table 5.18 of Appendix E. All of the sensitivity analyses were run using the aggregate figures.

Table 5	5.27a
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		Imp	ports		Decrease in
ISIC	Production domestic consumption (%)	ASEAN (%)	Rest of the world (%)	Increase in intra-ASEAN imports (US\$m)	imports from the rest of the world (US\$m)
Total manufactures <sup>*</sup>	-2.63	72.61	-1.13	503.29	112.72
yhatLink	35.27	111.01	30.28	769.52	-3063.46
yhat	34.08	168.77	33.03	1169.91	-3342.07
yhat	11.24	101.43	11.23	703.10	-1136.17
eta=2, y=.05	97.40	431.21	137.03	2989.11	-13864.55
eta=.5, yhat=.05	17.99	126.71	22.67	878.34	-2293.50
eta=2, yhat=.02	31.51	172.62	39.72	1196.56	-4019.19
eps=.5	-2.16	64.07	-0.53	444.15	53,86
eps=3	-1.45	65.82	0.19	456.24	-19.10
sigma-3	-3.86	100.44	-1.58	696.26	159.91
gamma-2	-2.32	67.66	-1.13	468.98	114.31
gamma-10	-2.26	73.21	-1.64	507.51	165.89
gamma2	-2.18	55.40	-0.84	384.04	84.95
non discriminatory	-3,55	59.06	2.30	409.41	-233.21
Atariff=0, vhat=.05	42.77	82.04	41.54	568.72	-4203.12

### Changes in Imports and Production for Domestic Consumption, Indonesia (with a 100% reduction in tariffs under various scenarios)

NOTE:

a. Total manufactures is the aggregate value for all manufactures shown in Table 5.18 of Appendix E. All of the sensitivity analyses were run using the aggregate figures.

# Table 5.27b

ISIC		Im	ports		Deerees in
	Production domestic consumption (%)	ASEAN (%)	Rest of the world (%)	Increase in intra-ASEAN imports (US\$m)	imports from the rest of the world (US\$m)
Total manufactures <sup>®</sup>	-6,08	72.55	-2.39	943.73	219.46
yhat-Link	69.71	170.95	63.32	2223.61	-5949.22
yhat	53.65	174.00	35.12	2263.28	-3299.69
vhat.02	15.84	102.60	11.12	1334.55	-1045.18
eta=2, y=.05	139.76	315.70	86.83	4106.29	-8158.07
eta=.5, vhat=.05	21,97	111.00	13.97	1443.77	-1312.18
eta=2, vhat=.02	40.77	143.87	25.21	1871.36	-2368.86
eps5	-4.89	64.13	-1.59	834.18	149.78
eps=3	-2.98	68.87	0.82	895.78	-77.48
sigma=3	-8.89	101.43	-3.17	1319.27	298.30
gamma-2	-4.78	66.50	-2.51	864.91	235.63
gamma-10	-4.31	70.52	-3.42	917.24	321.79
gamma2	-5.71	57.85	-1.27	752.45	118.89
non discriminatory	-6.70	59.99	1.76	780.26	-165.45
∆tariff=0, yhat=.05	69.15	80.37	41.53	1045.41	-3902.41

# Changes in Imports and Production for Domestic Consumption, Malaysia (with a 100% reduction in tariffs under various scenarios)

NOTE:

a. Total manufactures is the aggregate value for all manufactures shown in Table 5.18 of Appendix E. All of the sensitivity analyses were run using the aggregate figures.

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# Table 5.27c

		Imj	ports		Decruese in
ISIC	Production domestic consumption (%)	ASEAN (%)	Rest of the world (%)	Increase in intra-ASEAN imports (US\$m)	imports from the rest of the world (US\$m)
Total manufactures*	-0,63	61.26	0.82	71.00	-27.75
yhat-Link	39.28	80.51	16.93	93.31	-570.44
yhat	30.90	93,58	6.19	108.46	-208.74
yhat02	11.19	69.73	2.63	80.82	-88.70
eta-2, y05	87.17	202.38	52.72	234.57	-1776.41
eta	17.42	84.76	10.29	98.24	-346.74
eta-2, yhat02	29.36	105.06	16.97	121.77	-571.82
ep <i>s</i> 5	-0,61	53.65	0.66	62.18	-22.18
eps=3	-0.33	52.72	-0.21	61.11	7.04
sigma-3	-1.01	85.68	1.18	99.31	-39.87
gamma-2	-0.58	56.61	0.68	65.62	-22.85
zamma-10	-0.51	59.99	0.14	69.53	-4.56
gamma2	-0.50	48.25	0.24	55.92	-7.95
non discriminatorv	-1.08	54.03	4,74	62.63	-159.76
Atariff=0. vhat=.05	35.98	33.53	8.38	38.86	-282.53

# Changes in Imports and Production for Domestic Consumption, Philippines (with a 100% reduction in tariffs under various scenarios)

NOTE:

a. Total manufactures is the aggregate value for all manufactures shown in Table 5.18 of Appendix E. All of the sensitivity analyses were run using the aggregate figures.

# Table 5.27d

Changes in	Imports	and Produc	ction for	Domestic Consum	ption, Singapore
(with	a 100%	reduction	in tariff	s under various	scenarios)

		Im			
ISIC	Production domestic consumption (%)	ASEAN (%)	Rest of the world (%)	Increase in intra-ASEAN imports (US\$m)	Decrease in imports from the rest of the world (US\$m)
Total manufactures	-15.57	40,53	-1.88	1,027,58	273.37
vhat-Link	145.63	301.23	181.18	7637.89	-26885,11
vhat	66.55	131.70	46.86	3339.27	-6953.11
yhat=.02	15.07	69.56	15.38	1763.86	-2282.35
eta-2, y05	191.21	266.10	119.40	67.02	-17718.01
eta=.5, yhat=.05	23.36	77.77	19.75	1971.80	-2930.17
eta=2, yhat=.02	48.98	107.10	34.90	2715.63	-5179.13
eps=.5	-11.75	36.76	-1.02	932.00	151.72
eps=3	-10.13	38.75	0.53	982.43	-78.65
sigma=3	-21.24	57.24	-2.11	1451.33	312.92
gamna-2	-9.44	35.98	-2.38	912.24	353.83
gamma-10	-5.70	35.93	-3.56	911.06	528.93
ganma=.2	-17.80	37.00	-0.17	938.12	25.82
non discriminatory	-13.07	35.63	-0.87	903.39	129.35
$\Delta tariff=0$ , yhat=.05	99.98	80.39	53.69	2038.32	-7967.54

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NOTE:

a. Total manufactures is the aggregate value for all manufactures shown in Table 5.18 of Appendix E. All of the sensitivity analyses were run using the aggregate figures.

### Table 5.27e

ISIC		Im	ports		Decrease in
	Production domestic consumption (%)	ASEAN (%)	Rest of the world (%)	Increase in Intra-ASEAN imports (US\$m)	imports from the rest of the world (US\$m)
Total manufactures <sup>a</sup>	-1.03	96.67	1.19	284.67	-76.57
yhat-Link	46.90	165.50	46.22	487.35	-2936.60
yhat=.05	28.31	127.45	4.24	375.29	-269.23
yhat=.02	10.01	101.37	2.02	298.51	-128.33
eta-2, y05	73,19	198.27	23.08	583.85	-1466.34
eta.5, yhat05	14.41	110.79	4.73	326.25	-300.37
eta=2, yhat=.02	24.52	127.53	7.46	375.52	-473.75
eps5	-0,96	83.17	0.98	244.50	-61.97
eps-3	-0,84	81.09	-0.28	238.79	17.79
sigma-3	-1,69	139.75	2.02	411.53	-128.06
gamma-2	-0.77	87.26	0.88	256.96	-56.18
gamma=10	-0,59	91.88	0.15	270.54	-9.79
gamma2	-1,05	75.27	0.65	221.63	-41.08
non discriminatory	-1.32	83.79	8.50	246.74	-540.03
Atariff-0, vhat05	33.21	29.71	3.89	87.49	-247.44

### Changes in Imports and Production for Domestic Consumption, Thailand (with a 100% reduction in tariffs under various scenarios)

NOTE:

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a. Total manufactures is the aggregate value for all manufactures shown in Table 5.18 of Appendix E. All of the sensitivity analyses were run using the aggregate figures.

Table	5.	28
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Change in Exports								
(with a 100%	reduction in	n tariffs	under	various	scenarios)			

		Total exports				Exports to ASEAN				
Scenario	Indo- nesia (%)	Malay- sia (%)	Philip- pines (%)	Singa- pore (%)	Thai- land (%)	Indo- nesia (%)	Malay- sia (%)	Philip- pines (%)	Singa- pore (%)	Thai- land (%)
Total manufacture	s*10.11	9.01	7.73	2.52	8,99	51.43	45.11	71.70	68.48	62.82
vhat-Link	31.31	45.23	12.69	-24.57	7.66	275,68	285.62	268.87	129.44	223.68
vhat=.05	17.92	37.37	33.70	23.08	39.65	110.22	133.44	174.87	160.85	167.48
vhat=.02	12.14	18.97	16.60	7.86	19.34	68.99	73.03	101.28	96.60	93.62
eta-2, y=.05	6,60	76.96	37.16	50.62	72.50	152.04	284.87	286.02	344.69	344.81
eta=.5, yhat=.05	7.32	22.02	13.32	10.49	20.27	68.48	84.38	104.47	11 ??	104.57
eta=2, yhat=.02	6.59	31.28	17.51	18.27	28.71	83.28	115.68	133.44	149.,4	140.34
eps≔,5	8.22	7.41	6.29	-3.11	7.52	45.80	40.50	63.59	60.36	56.09
eps=3	7.93	6.71	7.06	-3.36	8.65	47.81	41.63	68.36	62.81	60.64
sigma-3	14.32	11.77	11.07	-6.85	12.44	74.89	63.84	105.91	92.11	91.39
gamma=2	8.83	8.58	6.66	1.17	8.08	44.75	40.25	62.08	65.34	54.98
gamma-10	8.72	9.37	6.68	5.98	8.39	44.00	40.65	61.52	72.43	54.88
gamma2	8.76	6.41	6.98	-10.38	7.91	47.14	39.82	65.06	48.92	57.06
non discriminator	y 42.20	37.94	41.23	29.57	40.27	46.07	39.41	59.55	56.65	52.28
∆tariff=0, yhat=.	053.93	26.75	22.54	26.80	28.63	49.74	79.00	79.56	78.05	86.28

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NOTE:

a. Total manufactures is the aggregate value for all manufactures shown in Table 5.18 of Appendix E. All of the sensitivity analyses were run using the aggregate figures.

### Table 5.29

Scenario	Indonesia (X)	Malaysia (%)	Philippines (%)	Singapore (%)	Thailand (%)
Total manufactures	-0.05	0.80	1.62	5.34	0.46
vhat-Link	34.48	58.86	32.13	19.28	41.11
yhat05	30.88	46.43	31.65	34.28	29.99
vhat02	11.42	17.23	12.65	9.72	11.39
eta=2, y=.05	79.38	111.93	73.71	86.83	73.09
eta=.5, yhat05	15.87	21.99	16.31	13.80	15.27
eta-2, yhat02	26.56	36.56	26.17	26.18	25.14
eps=.5	-0.10	0.57	1.24	-5.34	0.29
eps=3	0.41	1.32	1.66	-5.11	0.56
sigma-3	-0.25	0.27	2.24	-10.56	0.40
gamma-2	-0.11	1.14	1.37	-1.56	0.54
gamma=10	-0.08	1.75	1.43	2.97	0.74
gamma2	-0.01	-0.34	1.52	-12.29	0.27
non discriminatory	5.53	13.08	10.31	18.59	4.82
$\Delta tariff=0, yhat=.0$	5 35.06	50.36	32.36	45.65	32.54

# Change in Production (with a 100% reduction in tariffs under various scenarios)

NOTE:

a. Total manufactures is the aggregate value for all manufactures shown in Table 5.18 of Appendix E. All of the sensitivity analyses were run using the aggregate figures.

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