PRODUCTION AND TRADE EFFECTS OF AN ASEAN FREE TRADE AREA

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I. INTRODUCTION

A FTER more than twenty years of existence the Association of Southeast Asian Nations (ASEAN) is often hailed as one of the most successful regional groupings among developing countries.[1] 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 and expanded its frontiers 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. In terms of economic cooperation, however, ASEAN's experience attests to the difficulties involved. Although the ASEAN member states have individually ex- perienced strong economic performances, it is generally agreed that ASEAN as an organization has had little direct impact on the countries in the region in terms of stimulating growth through intra-ASEAN trade and investment.[2] None of their industrial cooperation schemes has really taken off and even the most promising private-sector-based scheme, the ASEAN Industrial Joint Ventures program, has a few working projects. The number and importance of goods covered under the preferential tariff arrangement (PTA) has increased, but the share of intra-ASEAN exports covered under the PTA remains marginal.

In many ways, the slow progress of ASEAN economic cooperation has been by design. Each individual country hopes to expand its exports to partner countries and to concurrently encourage domestic production. Not surprisingly, the less developed countries fear that imports from partner countries may expand enough with increased trade preferences so as to slow domestic industrialization. Partly as a result of these concerns, the approach to economic integration by ASEAN leaders has been cautious and has in many ways ensured that the effects of the ASEAN PTA remain marginal.

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[1] The Association of Southeast Asian Nations (ASEAN) was established on August 8, 1967 by Indonesia, Malaysia, the Philippines, Singapore, and Thailand to promote peace, stability, and economic growth in the region. The sixth member, the oil-rich state of Brunei, joined in 1984.
[2] See, for example, [23] [24] [27] [31].

Presently, the ASEAN countries are looking for a bold new approach toward integration as a response to changing internal and external conditions. As evidenced by the European Community move to form a single unified market in 1992 and the likely formation of a North American Free Trade Area, regional trade relationships have become more important. At the same time, the prospect for a successful GATT round is uncertain. The liberalization and market reform in Eastern Europe and other developing regions also portend increasing competition for investment flows. To face these challenges, ASEAN leaders have decided to form an ASEAN Free Trade Area (AFTA). It is felt that greater ASEAN economic cooperation can help increase the bargaining position of the member countries as well as enhance the attractiveness of the ASEAN market.

With far-reaching domestic economic reform programs in all ASEAN countries and the movement toward more liberal private-sector-oriented economies, the ASEAN countries will find closer economic cooperation easier now than previously. Increasing industrialization levels of all countries and the unilateral reduction of barriers to trade and investment are facilitating greater economic integration. With rapid industrialization, expanding exports of manufactured goods constitute the main thrust of the flourishing regional economic development. As a result of these changes, the ASEAN free trade area was formed in January 1992. Many questions about the probable effects for greater economic cooperation however, need to be analyzed before ASEAN integration can take place.

Previous studies [20] [22] estimating the effect of tariff reductions find that the increase in intra-ASEAN trade will be positive but modest, suggesting that the concerns of some members may be unfounded. But none of these studies have gone beyond the simple price elasticity approach which estimates import growth resulting from a tariff reduction. To analyze ASEAN integration in a way which will answer some of the concerns of the member countries, it is important to examine how closer integration will change patterns of exports, production, and consumption. This study is the first such analysis. The paper will estimate the effects of a free trade area in ASEAN. It will begin by briefly examining what has been accomplished in terms of trade cooperation and the problems involved.

II. DESCRIPTION OF ASEAN COOPERATION

The ASEAN member countries are not a homogeneous group of countries. They differ in a number of historical and cultural aspects including colonial heritage, language, religion, and traditions. In addition to these differences, the prospective members have had a number of internal political disputes. 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 initial attempts to establish organization in the postwar period.

Recognizing the need for cooperation, a meeting was organized in Bangkok

and in August 1967 the Bangkok Declaration that established ASEAN was adopted. However, the Bangkok Declaration provided only a generalized statement on the need 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 symbol of intentions 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. Under the common threat of military aggression, the ASEAN leaders united and began to look seriously at their mutual interests. To increase the substance of their cooperation, the first ASEAN Summit was convened in February 1976 in Bali. The summit led to the signing of the Treaty of Amity and Cooperation in Southeast Asia and the 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 as 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.

In 1977 the Agreement on ASEAN Preferential Trading Arrangements (PTA) was signed by the five ASEAN Foreign Ministers. The ASEAN Committee on Trade and Tourism (COTT) was also established at this time to conduct trade negotiations within the framework of this agreement and to supervise its implementation.[3] The PTA represented the first major commitment on the part of all the ASEAN countries towards a joint effort to liberalize intraregional trade. Unlike other preferential trading arrangements among developing countries, the PTA had no specific targets (i.e., to form a free trade area or customs union by a certain date), but it provided a mechanism whereby intra-ASEAN trade could be liberalized at a pace that was acceptable to all member countries.

The extension of trade preferences was initially done on a product-by-product basis, selected by a matrix approach and a voluntary approach. Trade preferences started with the exchange of voluntary offers on twenty products which was subsequently increased to cover twenty-one items selected by the matrix approach and fifty items by the voluntary approach for a total of seventy-one items (6-digit BTN classification). In 1976, estimates for the value of imports by ASEAN countries from other ASEAN countries under concessional tariff rates totaled U.S.$47 million, ranging from about U.S.$18 million for Malaysia to about U.S.$100,000 for the Philippines [20]. This accounted for less than 2 per cent of total intra-ASEAN trade and a little more than 12 per cent of total imports of these items (intra-ASEAN trade as a whole comprised about 12 per cent of the total trade of ASEAN countries).

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 per cent were approved for more than 6,000 items with intraregional trade value of less than U.S.$50,000 as recorded in the trade statistics for 1978, subject to national exclusion list of sensitive products. The ceiling was subsequently raised to U.S.$500,000, then U.S.$1,000,000, and to U.S.$10 million in 1982. Finally, in 1984, the ASEAN Foreign Ministers approved the application of a 20–25 per cent tariff cut on all items with import value beyond U.S.$10 million, effectively doing away with the ceiling.

As of June 1986, 12,647 items are covered under ASEAN PTA. Nearly one-half of these items are accorded 20 to 25 per cent margin of preferences, though the distribution varies by country [21]. The effective average preference margins differed from the average in Singapore and Malaysia. Because of Singapore's virtual free-trade status, many items are accessed zero duty. Thus, 93 per cent of the margin of preferences granted by Singapore were simply binding its tariffs at zero, making its average tariff concession low at 2.3 per cent. Malaysia, on the other hand, with its unilateral 100–per cent preferential tariff reductions on many items, had an average preference margin of 42 per cent.

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) continued to constrain the expansion of intra-ASEAN trade. The items on the exclusion list comprised 25 per cent of all goods in the Philippines, 39 per cent in Malaysia, 54 per cent in Indonesia, and 63 per cent in Thailand [21]. 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 per cent of items where trade was less than U.S.$500,000 were on the exclusion list, as compared to 60 to 80 per cent of the more heavily traded items.

Nonetheless, intra-ASEAN trade increased rapidly as a share of total trade in the mid-1970s (Figure 1). At its peak in 1983, intra-ASEAN trade accounted for 24 per cent of exports and 21 per cent of imports. It is clear, however, that the PTA had little to do with this increase. Studies have shown that intra-ASEAN trade consisted largely of petroleum trade between Indonesia, Malaysia, and Singapore. Moreover, since petroleum accounts for 50 per cent of intra-ASEAN exports, petroleum prices are a major factor in the value of trade in the region. Singapore refines the crude oil of Brunei, Indonesia, and Malaysia, and exports the refined oil to third countries or back to the ASEAN countries. Additionally, Ooi [23] estimated that the share of intra-ASEAN trade covered by the PTA to be less than 5 per cent. Devan [11] finds that it accounted for 3 and 4 per cent of Indonesian imports from ASEAN in 1983 and 1984, and only Malaysia and Singapore were recipients. For Thailand, even less trade is covered by the PTA; preferential trade accounts for about 1 per cent of Thailand's imports from ASEAN. Singapore accounts for U.S.$8 million of the total U.S.$11 million in imports covered by the PTA.

In another study looking at the effect of the PTA, Tan [27] finds that preferences are often given for commodities that are not traded in the region. For example, Thailand offers preferences for wood products that it does not import

Fig. 1. Direction of ASEAN Trade

A. Exports

B. Imports
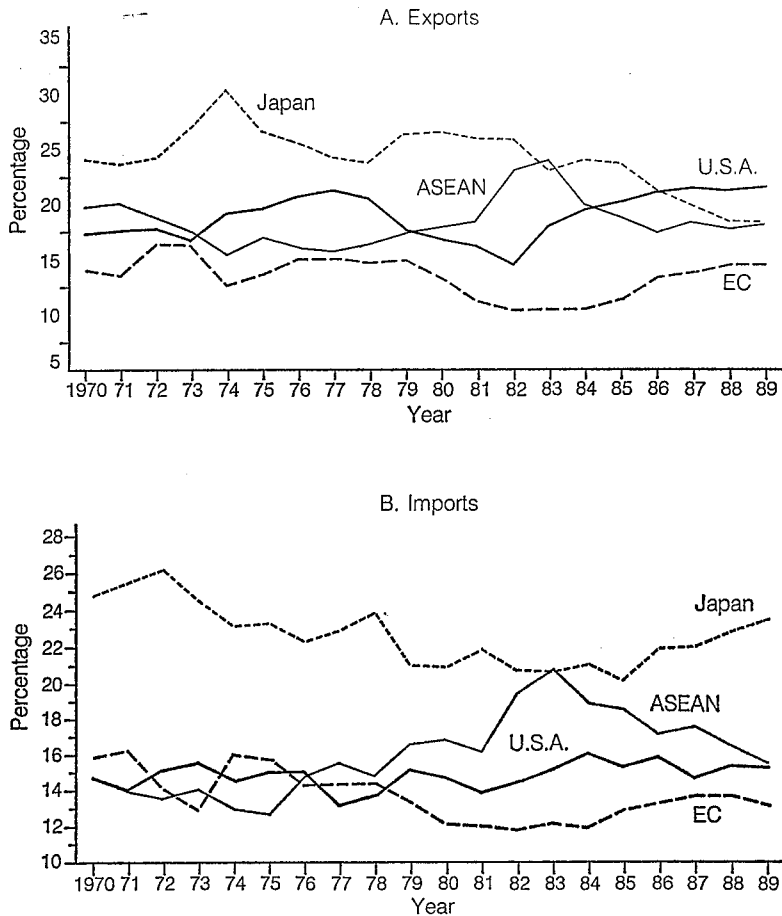
Source: International Monetary Fund, *Direction of Trade Statistics*, computer data tapes and *Yearbook 1990*.

at all. Imada [14] also shows that the margin of preferences are generally not given in industries where other countries have comparative advantage. Additionally, the tariff reduction offered on the items may be too low to permit a significant impact on potential imports, except for items with extremely high price elasticities of import demand. Items now given preferences under the PTA generally have been found to have moderate to low price elasticities [14], making the effect of small tariff preferences marginal.

As it became apparent that ASEAN economic cooperation was falling well short of expectations, the third ASEAN Summit in 1989 addressed some of the

institutional problems plaguing the PTA. Most importantly, it gave clear direction to trade cooperation. For the first time, a goal was set to cover 50 per cent of the value or 90 per cent 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 per cent to 50 per cent and the exception list was restricted to 10 per cent of all items.

At the end of 1988, 1,679 items were removed from the exclusion list and introduced into the PTA, and preference margins were raised to a minimum of 25 per cent [1]. Further deepening of preference margins and reductions in the exclusion list have been undertaken in 1989 as well. However, these changes have not substantially increased the value of trade covered under the PTA.

The ASEAN Heads of State met in Singapore for the fourth ASEAN Summit in January 1992 and boldly agreed to the creation of AFTA in fifteen years. After twenty-five years of slow progress in ASEAN economic cooperation, the commitment to create AFTA was a tremendous step forward. Many of the details of the agreement, however, have yet to be worked out.

III. MEASURING THE IMPACT OF AN ASEAN FREE TRADE AREA

Will a more comprehensive attempt at integration have a positive effect on trade and growth in ASEAN? Because the ASEAN PTA has thus far been relatively ineffective, it is useful to estimate what the effect would be if a large proportion of trade was actually covered under the PTA. An ex-ante model is therefore used to forecast imports in the post-integration period in comparison with a benchmark status quo. Total future imports from both partners and non-partners are estimated both with and without integration.

All past studies on ASEAN cooperation which quantify the ex-ante effects of increased PTAs use the price-elasticity approach which neglects to account for supply-side effects. Naya [20] was the first to use this methodology in relation to all ASEAN countries. He found that if all the ASEAN countries reduced tariffs preferentially by 10 per cent across-the-board, intra-ASEAN imports and exports would increase by about U.S.$32 million. Ooi [22] did a similar study and found that the trade creation effect would be negligible. Trade diversion would also be small though in many cases it would be larger than trade creation. Devan [11] used the same methodology and found that a reduction of 25 and/or 50 per cent in the margins of preferences would result in a 4.8 per cent or a U.S.$110.57 million increase in trade for the four resource-rich ASEAN countries. Trade diversion would be about half the size, valued at U.S.$58.67 million.

These projections make many strong assumptions and are extremely limited in that they can only estimate trade expansion. Supply factors are excluded, which affects the results and precludes the analysis from examining production effects. Clague [7] showed that the result would be substantially different if export supply elasticities were less than infinity. Janssen [15] also argued that in a model where supply factors are not considered, estimated changes resulting from integration are likely to be small.

A revised version of the Armington [2] [3] approach developed by Tyers ([28] [18]) 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. This study is the first to attempt to examine the reallocation effects of ASEAN integration.

A. Methodology

Armington [2] [3] begins with the fundamental assumption that products from different countries are imperfect substitutes; thus demand for products is distinguished by place of production.[4] In value terms:

$$X_{ij} = b_{ij}^{\sigma i} X_i (P_{ij}/P_i)^{-\sigma i}, \tag{1}$$

where

X_{ij} = demand for good i from country j,

b_{ij} = a constant,

σ_i = 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_i, and is a function of goods in the ith market.

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

$$\frac{d(P_{ij}X_{ij})}{P_{ij}X_{ij}} = \eta_i \frac{dY}{Y} - [(1-S_{ij})(\sigma_i-1) + S_{ij}(\varepsilon_i-1)]\frac{dP_{ij}}{P_{ij}}$$
$$+ \sum_{k \neq j}[S_{ik}(\sigma_i-1) - S_{ik}(\varepsilon_i-1)]\frac{dP_{ik}}{P_{ik}} + \sum_{k \neq i}\varepsilon_{i/k}\frac{dP_k}{P_k}, \tag{2}$$

where

η_i = income elasticity of demand for X_i,

Y = income of home country,

S_{ij}, S_{ik} = market shares, i.e., X_{ij}/X_i and X_{ik}/X_i,

ε_i = direct own-price elasticity of demand for good i,

$\varepsilon_{i/k}$ = cross elasticity of demand for X_i with respect to k.

The growth of demand for X_{ij} 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}

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[4] Two other major assumptions used by Armington [2] are: (1) The 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) The demand function for X_i is linear and homogeneous. This means that market shares depend only on the relative prices of the products in the market and not on the size of the market itself.

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 [2] 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.

A variant of this model, including the effect of growth in GNP and production was developed by Tyers ([28] [18]). Tyers starts with the total differentiation of the Armington equation which yields the percentage change in demand for X_{ij}, and the changes in the income and price variables. He assumes that the fourth term is small enough to be ignored and, recognizing that the parameters of this equation will differ among consuming countries, a country subscript h is inserted.

Equation (2) can then be rewritten in proportional change form:

$$\hat{X}_{hij} = \eta_{hi}\hat{Y}_h + \sum_k e_{hijk}\hat{P}_{hijk} \begin{cases} e_{hijk} = -[(1-S_{hij})\sigma_{hi} + S_{hij}\varepsilon_{hi}], \ j=k \\ e_{hijk} = S_{hik}(\sigma_{hi}-\varepsilon_{hi}), \ j \neq k. \end{cases} \quad (3)$$

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:

$$P^m_{hij} = g^m_{hij}P_{hij}, \quad (4)$$

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

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

$$P_{hij} = g^e_{hij}P_{ij}, \quad (5)$$

where g^e_{hij} is the ratio of the border price in country h to the producer price in country 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:

$$\hat{P}^m_{hij} = \hat{P}_{hij} + \hat{g}^m_{hij}, \quad (6)$$

$$\hat{P}_{hij} = \hat{P}_{ij} + \hat{g}^e_{hij}. \quad (7)$$

2. Supply effects

It is assumed that each country produces a homogeneous 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:

$$q_{ij} = a_{ij} P_{ij}^{\gamma_{ij}},$$ (8)

where

q_{ij} = real supply of good i in country j,
a_{ij} = a constant,
γ_{ij} = the elasticity of supply of good i in country j,
P_{ij} = the producer price of good i in country j,
In proportional change form, this becomes:

$$\hat{q}_{ij} = \gamma_{ij} \hat{P}_{ij}.$$ (9)

The system is closed by assuming that the proportional change of the demand for the product of country j must be equal to the proportional change in country j's production.

In proportional change form, this can be expressed as:

$$\sum_l S_{lij}^e \hat{X}_{lij} - \hat{q}_{ij} = 0,$$ (10)

where $S_{lij}^e = X_{lij} / \sum_l X_{lij}$ or the share of country j's total output of good i going to destination l, where $l = h, j,$ or k.

Six countries are examined in the model, Indonesia, Malaysia, the Philippines, Singapore, Thailand, and the rest of the world. All six countries are simultaneously producers, importers, and exporters of each commodity. For each commodity, there are thirty-six unknowns of X_{hij}, P_{hij}^m, and P_{hij}, and six unknown producer prices, P_{ij}. The solution is found using thirty-six equations of (3), (6), and (7), and six equations of (10).

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

This becomes

$$-k_{hij} = \left(\frac{e_{hijj}}{\gamma_{ij}} S_{hij}^e - 1 \right) \hat{X}_{hij} + \frac{e_{hijj}}{\gamma_{ij}} \sum_{l \neq h} S_{lij}^e \hat{X}_{lij}$$

$$+ \sum_{k \neq j} \frac{e_{hijk}}{\gamma_{ij}} \sum_l S_{lik}^e \hat{X}_{lik},$$

where k_{hij} introduces exogenous disturbances,

$$k_{hij} = \eta_{hi} \hat{Y}_h + \sum_k e_{hijk} (g_{hik}^e + g_{hik}^m).$$

The equation can be rewritten in matrix form as follows:

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

where X is a 36×1 matrix, A is a 36×36 matrix and K is a 36×1 matrix.

Applying this approach, the effects of discriminatory tariff cuts are examined. Different trade liberalization policies are considered: (1) total trade liberalization within ASEAN, to be accomplished over ten periods; and (2) extending a 50–per

THE DEVELOPING ECONOMIES

TABLE I

SUMMARY RESULTS OF A FREE TRADE AREA IN ASEAN
(CHANGE IN U.S.$ MILLIONS AND PERCENTAGE CHANGE)

| | Imports from (Exports of): | | | | | | |
	Indonesia	Malaysia	Philippines	Singapore	Thailand	Intra-ASEAN Imports	Total Imports
Imports of (Exports to):							
Indonesia	−134.7	40.4	15.0	229.9	97.5	382.8	230.1
%	−1.2	59.6	70.4	46.8	86.4	55.2	2.1
Malaysia	33.8	−214.4	94.2	296.6	99.6	524.3	329.4
%	49.5	−2.2	48.4	36.9	42.5	40.3	3.1
Philippines	6.2	18.0	−24.6	18.7	13.8	56.7	53.9
%	34.3	63.4	−0.3	37.9	68.5	48.9	1.5
Singapore	25.1	54.4	2.5	−262.5	9.0	91.0	246.7
%	5.7	3.3	2.3	−5.2	2.7	3.6	1.4
Thailand	15.2	83.9	10.1	96.8	−101.3	206.1	188.0
%	61.2	87.0	73.4	60.8	−0.4	70.0	2.8
Intra-ASEAN Exports	80.4	196.7	121.9	642.0	220.0	1,260.9	1,048.1
%	14.5	10.7	35.8	42.7	31.1	25.5	2.1
Total Exports	83.4	181.3	122.8	221.2	224.2	1,880.9	
%	3.0	2.4	4.0	1.5	5.0	6.7	
Total Production[a]	−51.3	−33.1	98.2	−41.3	122.8		
%	−0.4	−0.2	0.9	−0.2	0.4		

Note: Production for domestic consumption appears as a country's exports/imports
to itself.
  [a] Total production = total exports + production for domestic consumption.

cent preferential tariff cut over five years within ASEAN, using a slower rate of
reduction to account for the seven years allowed for the Philippines and Indonesia
under the agreements reached at the third summit. As ASEAN is now considering
a free trade area, the first case is highlighted. The second case follows the agree-
ment of the third summit; although it includes all manufactured goods rather than
selected commodities.
   Imada [14] found that the largest scope for intra-ASEAN trade would be
found in manufactured goods. There are fewer complementarities in the trade
of primary goods in the region, as all of the countries with the exception of
Singapore are endowed with similar commodities. Although there is some scope
for enhanced trade in agricultural commodities, agricultural trade issues are ex-
tremely sensitive, and as such quotas and other nontariff barriers are widely used,
making an analysis of tariff reductions less meaningful. Further, manufactures
account for an increasing share of ASEAN exports and it is likely that this trend
will continue. A review of the data sources is found in the statistical appendix.

TABLE II-A

SUMMARY OF THE EFFECTS OF A FREE TRADE AREA IN INDONESIA
(PERCENTAGE CHANGE)

ISIC	Production	Consumption	Imports from		Exports to	
			ASEAN	World (Including ASEAN)	ASEAN	World (Including ASEAN)
312	−1.8	1.9	93.7	15.5	20.4	2.2
313	−2.8	−0.4	240.2	69.2	302.2	1.2
314	0.3	−0.3	147.3	14.1	397.4	133.6
321	0.2	0.0	71.6	0.6	14.3	2.3
322	0.8	0.2	282.4	2.9	17.7	1.0
323	0.0	0.0	39.5	0.6	1.5	−0.1
324	0.1	0.7	105.3	8.7	0.4	0.1
331	1.3	0.2	35.2	8.1	13.3	1.4
332	−1.1	2.5	75.6	10.0	8.0	1.5
341	1.1	0.1	58.9	0.3	16.8	14.0
342	−0.1	0.2	39.2	2.5	24.4	24.4
351	−1.2	0.3	35.1	1.5	32.6	14.5
352	0.1	0.1	49.8	1.2	5.2	2.3
355	−0.3	0.2	63.7	4.5	0.0	−0.1
356	−0.1	0.5	66.2	6.9	31.8	15.3
361	0.0	0.0	190.6	0.0	90.4	72.3
362	0.4	0.7	48.8	6.5	25.0	15.1
369	−2.0	0.5	64.4	12.1	24.5	8.8
371	−0.4	0.0	38.1	0.4	25.8	0.1
381	−0.7	0.7	92.3	2.3	3.6	2.0
382	0.2	0.1	31.6	0.1	3.9	3.5
383	−0.4	0.9	43.1	2.3	4.0	4.0
384	−0.8	1.2	59.4	2.1	3.4	0.8
385	2.7	0.2	32.3	0.2	7.5	5.4
390	1.6	0.0	51.5	0.1	4.9	2.0
Total	−0.4	0.4	55.2	2.2	14.5	3.0

B. *Discussion of Results: Free Trade Area in ASEAN*

Assuming moderate income growth from other sources, intra-ASEAN imports
and exports increase sharply when intra-regional tariffs are estimated as compared
to the baseline scenario (Table I). For manufactures as a whole, intra-ASEAN
imports increase by 25 per cent over the baseline, or about U.S.$1.3 billion (real
1983–84 dollars). This sharp increase in imports comes partly at the expense
of reduced imports from the rest of the world in the resource-rich countries
(Indonesia, Malaysia, the Philippines, and Thailand), and total imports increase
between 2 to 5 per cent. Intra-ASEAN exports increase as well but unlike the
case of imports, the increase is not at the expense of exports to the rest of the world.
In Singapore, however, the impact on imports is reversed. Its increase in ASEAN
imports is small due to its low initial tariffs though its exports expand sharply.
Imports from the rest of the world increase in Singapore to supply the domestic

TABLE II-B

SUMMARY OF THE EFFECTS OF A FREE TRADE AREA IN MALAYSIA
(PERCENTAGE CHANGE)

ISIC	Production	Consumption	Imports from		Exports to	
			ASEAN	World (Including ASEAN)	ASEAN	World (Including ASEAN)
312	−0.3	0.4	38.4	10.9	13.1	2.3
313	12.6	0.6	373.8	36.7	519.6	426.2
314	−0.2	0.8	451.4	27.1	381.1	139.8
321	−0.2	0.2	59.0	2.8	9.3	3.4
322	1.9	8.3	65.8	13.9	8.4	2.4
323	−0.6	2.8	44.5	5.3	1.2	0.6
324	0.1	1.4	65.4	2.4	0.9	0.3
331	2.1	1.6	33.7	23.4	15.7	3.1
332	−0.1	1.9	73.6	11.0	6.1	3.4
341	−1.3	0.1	33.6	1.1	4.0	2.8
342	−0.6	0.2	28.3	5.9	1.8	1.1
351	0.0	0.4	31.6	3.0	34.2	13.1
352	−0.5	0.1	25.0	1.6	4.8	2.9
355	0.2	0.2	131.0	6.2	20.3	6.3
356	−0.1	1.1	67.7	8.5	17.3	9.5
361	0.0	0.0	66.9	0.0	0.2	0.1
362	−1.9	0.5	53.8	4.7	5.1	2.9
369	−1.7	0.6	56.5	10.6	4.9	4.0
371	−0.2	0.0	24.5	0.2	3.3	1.6
381	−0.3	0.4	42.2	2.3	12.8	5.5
382	2.3	0.0	17.7	0.0	8.8	4.0
383	−2.1	1.4	40.2	3.1	−2.3	−0.7
384	−0.4	0.9	47.2	1.5	8.2	1.1
385	0.3	0.1	14.9	0.1	2.2	0.4
390	0.6	0.0	10.0	0.1	11.5	1.6
Total	−0.2	0.6	40.3	3.1	10.7	2.4

economy as Singapore expands exports to ASEAN countries by reducing production for the domestic market.

Production for domestic consumption decreases in all of the ASEAN countries as more efficient exports replace less efficient domestic firms and as goods formerly produced for the domestic market are now exported. This decrease in production for the domestic market corresponds to one element of trade creation, which considers the welfare gain from more efficient resource allocation. Because of the increase in exports, however, total manufacturing production remains virtually unchanged. Total consumption increases in the resource-rich countries but is unchanged in Singapore where tariffs are close to zero in the initial period. This increase in consumption corresponds to the second element of trade creation, consumption gains due to lower prices coming from the reduction of tariffs. The sum of the production and consumption effect gives us what is normally called trade creation, although it should be noted that these estimates do not truly

TABLE II-C

SUMMARY OF THE EFFECTS OF A FREE TRADE AREA IN THE PHILIPPINES
(PERCENTAGE CHANGE)

ISIC	Production	Consumption	Imports from		Exports to	
			ASEAN	World (Including ASEAN)	ASEAN	World (Including ASEAN)
312	0.2	0.6	77.6	8.2	32.9	1.3
313	0.1	0.4	94.0	6.6	387.3	15.2
314	0.0	0.0	130.1	5.6	252.3	1.6
321	−0.1	0.0	66.4	0.9	39.7	1.4
322	0.4	1.5	75.2	11.5	31.5	0.4
323	−0.1	−0.1	58.3	−0.1	65.3	−0.1
324	0.0	0.0	82.9	0.1	0.6	0.1
331	−0.2	0.0	44.4	−0.6	15.8	−0.3
332	0.1	0.0	83.2	0.1	15.9	0.1
341	0.0	0.0	50.6	0.3	33.5	1.6
342	0.0	0.0	44.8	0.6	0.7	0.5
351	−0.5	0.2	31.8	1.1	38.9	2.8
352	0.3	0.0	42.4	0.6	38.6	25.5
355	0.0	0.3	47.6	2.5	9.7	1.9
356	0.4	0.2	66.2	6.8	91.6	8.9
361	0.0	0.0	82.1	0.0	0.2	0.0
362	0.5	0.1	53.2	1.0	24.0	11.8
369	2.3	0.1	57.5	1.2	32.9	18.0
371	0.1	0.0	36.1	0.1	34.5	1.8
381	−0.1	0.2	55.6	1.1	23.5	4.4
382	3.0	0.0	28.8	0.0	15.1	6.9
383	10.8	0.6	45.6	2.2	39.4	26.1
384	0.4	0.3	42.2	0.7	43.8	5.9
385	1.1	0.1	25.9	0.1	7.8	1.6
390	−0.7	0.0	58.5	0.0	15.4	−0.7
Total	0.9	0.2	48.9	1.5	35.8	4.0

measure the welfare triangles discussed by Viner [30] and Meade [19] as it is not multiplying the total effects times price changes and dividing by two. Trade diversion, or the reduction in imports from the rest of the world, can be similarly estimated as the decrease in imports from non-partners, but like trade creation it is not a true measure in the Vinerian sense of welfare. Using these estimates, we find that all ASEAN countries have net gains, ranging from U.S.$50 million for the Philippines to more than U.S.$400 million for Singapore.[5]

Moreover, the results show that the distribution of industrial activities in the region will shift (Tables II-A–E). For Indonesia, it is not surprising that the

[5] In Malaysia and Singapore, however, these results were complicated in the nonelectrical (SITC 383) and electrical machinery (ISIC 382) industries, respectively, because of exceptionally large exports to the rest of the world as compared to exports to ASEAN and to production for domestic consumption. This large share of exports to the rest of the world overwhelmed all other factors, and the decline in exports to the rest of the world resulted in a relatively large decline in total production in these two industries.

TABLE II-D

SUMMARY OF THE EFFECTS OF A FREE TRADE AREA IN SINGAPORE
(PERCENTAGE CHANGE)

ISIC	Production	Consumption	Imports from		Exports to	
			ASEAN	World (Including ASEAN)	ASEAN	World (Including ASEAN)
312	−0.6	−0.1	0.8	1.5	57.9	1.3
313	−1.7	5.6	520.1	35.8	338.6	33.7
314	1.0	0.4	374.8	3.1	91.3	6.5
321	−0.5	0.0	1.0	0.7	57.0	0.9
322	−5.5	−1.5	8.0	4.5	55.8	−3.3
323	−7.1	−0.8	1.4	0.8	31.6	−4.1
324	−5.2	−1.8	0.8	0.7	79.3	0.3
331	−3.7	−0.1	3.7	3.7	26.8	−2.6
332	−0.8	−0.6	6.0	2.4	73.2	1.9
341	2.5	−0.1	0.7	0.7	48.1	5.5
342	1.0	0.0	1.1	0.4	30.7	6.0
351	5.9	0.1	30.2	0.7	37.2	8.0
352	1.9	−0.1	1.2	0.8	40.5	4.3
355	1.1	−0.7	0.2	0.3	83.8	8.5
356	0.4	−0.6	8.4	4.7	70.7	10.2
361	−11.1	−0.3	0.2	0.1	84.7	−7.3
362	4.0	−0.1	1.8	1.2	52.6	7.5
369	3.1	−0.1	2.2	1.6	58.8	25.6
371	4.7	0.0	0.2	0.1	32.6	6.0
381	3.6	−0.2	1.6	1.0	63.9	13.2
382	−7.5	−0.1	3.5	1.8	25.9	−7.4
383	1.5	0.0	−2.6	1.2	37.9	2.7
384	5.7	0.0	2.6	0.3	53.6	7.5
385	−1.4	0.0	0.1	1.1	26.4	0.2
390	−9.4	−0.6	4.6	3.4	9.6	−6.5
Total	−0.2	−0.1	3.6	1.4	42.7	1.5

largest percentage increases in overall production would occur in labor-intensive and resource-intensive industries such as textiles (ISIC 321), garments (ISIC 322), wood products (ISIC 331), and paper and paper products (ISIC 341). The model also projects that production in nonelectrical machinery (ISIC 382) and professional goods (ISIC 385) would increase relatively significantly, but these latter industries are all industries where total production is negligible in the initial period. Declining sectors include food products (ISIC 311/312), beverages (ISIC 313), furniture (ISIC 332), industrial chemicals (ISIC 351), nonmetal products (ISIC 369), transport equipment (ISIC 384), and miscellaneous manufactures (ISIC 390).

Production in Malaysia would increase most in relatively labor-intensive sectors including clothing (ISIC 322) and wood products (ISIC 331); there would also be a significant increase in the more capital-intensive nonelectrical machinery sector (ISIC 382). The largest declines for Malaysia are in food products (ISIC

TABLE II-E

SUMMARY OF THE EFFECTS OF A FREE TRADE AREA IN THAILAND
(PERCENTAGE CHANGE)

ISIC	Production	Consumption	Imports from		Exports to	
			ASEAN	World (Including ASEAN)	ASEAN	World (Including ASEAN)
312	1.9	0.8	162.1	23.0	42.1	7.5
313	0.1	0.2	187.9	6.6	561.8	44.4
314	−1.5	−1.4	80.8	19.9	264.5	1.3
321	−0.1	0.0	117.6	2.9	16.0	1.6
322	0.2	0.0	161.9	4.8	19.4	1.0
323	0.5	0.0	117.3	−0.1	11.4	0.8
324	0.0	0.0	120.9	0.1	0.6	0.1
331	−2.6	4.4	49.0	44.2	12.8	−0.1
332	0.2	0.0	104.0	0.1	13.0	1.4
341	0.1	0.1	72.8	1.9	38.5	22.6
342	−0.1	0.1	40.7	2.0	9.5	3.6
351	−0.2	0.3	60.6	1.2	33.9	11.2
352	−0.2	0.2	83.9	2.7	13.8	7.1
355	0.1	0.2	92.6	2.7	12.5	2.4
356	−0.3	0.3	128.2	7.7	18.5	1.4
361	0.0	0.0	172.6	0.0	0.2	0.0
362	0.0	0.3	97.1	6.5	26.7	6.9
369	0.6	0.0	93.2	1.2	44.0	16.4
371	0.0	0.0	38.0	0.0	3.7	0.7
381	0.2	0.2	63.7	1.7	31.2	7.0
382	−0.8	−0.1	37.2	0.6	9.9	2.3
383	0.3	1.0	50.7	3.4	12.0	3.6
384	−0.1	0.1	62.5	0.8	36.3	5.8
385	−1.2	0.1	50.5	1.1	5.3	0.1
390	−0.3	−0.3	71.9	−0.8	19.7	−0.4
Total	0.4	0.3	70.0	2.9	31.1	5.0

311/312), paper and paper products, glass and glass products, and nonmetal products.

The Philippines would see the largest production increases in more capital-intensive production including nonmetal manufactures, electrical machinery, and nonelectrical machinery (ISIC 382 and 383) with small declines in wood products, and industrial chemicals. Other manufactures increase sharply. 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.

As would be expected, production in Singapore would increase in heavy industries such as industrial chemicals (ISIC 351), iron and steel (ISIC 371), electrical machinery (ISIC 383), and transport equipment (ISIC 384), while significant declines in production would occur in several labor-intensive industries such as textiles, clothing, and pottery/china. Surprisingly, nonelectrical machinery (ISIC 382) decreases sharply, but this may be overstated because of the small size of

Singapore's production for the domestic market relative to imports and the importance of trade weights in the model.

Thailand would substantially increase production in food products (ISIC 311/ 312), with smaller increases in electrical machinery, leather products (ISIC 323), and metal and nonmetal products. Wood products, nonelectrical machinery, and industrial chemicals industries would decline.

IV. CONCLUSION

Although ASEAN PTA up until now has had little discernible impact on trade and growth in the region, the results of the study show that intra-ASEAN trade will expand sharply if intraregional trade is liberalized, partially or completely. The existing structure of protection in all of the resource-rich member 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 generally positive, impact on production and total trade.

The industrial distribution of production will change, but the fear of any one country dominating the region is unfounded. Considering even moderate levels of income growth amplifies the growth in intraregional trade. Differentials in economic growth rates cause imports from the region to increase by relatively more in the faster growing countries.

Because the model used is an exercise in comparative statics, it does not incorporate dynamic considerations such as economies of scale and learning by doing. Other potentially large dynamic benefits were also not considered and hence the benefits of ASEAN trade liberalization are likely to be underestimated. A more detailed industrial level study will be required to estimate the effects of some of these dynamic factors. In addition, improved estimates for the various elasticities may increase variability of the effect of tariff reductions of the individual countries. An examination of the effect of intermediate goods would also improve the results.

A major limitation of this kind of study is that trade expansion could also occur in industries that cannot be anticipated a priori. For example, more rapid industrializaiton 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.

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 is allowed for in the model. At the same time, linkages between commodities, i.e., production of transport equipment and machinery, is not considered.

As the world continues to look toward regionalism as a solution to trade problems, ASEAN has also begun to look at the possible effect of enhancing its preferential trading arrangements. It is clear that intra-ASEAN trade will expand sharply with a free trade area, but the impact on total trade and production is

likely to be small. If cne of the goals of AFTA is to diversify exports away from the United States and other developed country markets toward ASEAN markets, then an enhanced PTA will accomplish this goal. The dynamic effects of integration may do much to promote growth and production, but the direct effects will be small. ASEAN countries will need to remain open to and continue to push their exports to cther markets as well.

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STATISTICAL APPENDIX

The import data are calculated as an average of two years, 1983 and 1984, taken from the United Nations, *Commodity Trade Statistics,* 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 United Nations' conversion table (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 per cent. 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^{-6} 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, *Industrial Statistics Yearbook, 1985* and trade data from the United Nations, *Commodity Trade Statistics*, 1983 and 1984. Data are not available for petroleum refineries (ISIC 353), petroleum and coal products (ISIC 354), and nonferrous metals. The term total manufactures used in this study excludes these commodities. To obtain estimates for domestically-consumed production, or internal trade, commodity exports are subtracted from average gross output for 1983 and 1984. In some cases, the estimate for domestically consumed production is adjusted for re-exports or if negative, are changed to 10^{-6}.

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.

Literature searches are conducted to find import price, import income, and production elasticities. No good import price elasticities for the ASEAN countries at a disaggregated level are found. In Lim [17], 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 [16] finds the overall import price elasticity in the Philippines to be −2.7, but no disaggregated estimates are available. Deaton [10] estimates elasticities for a few agricultural products for Indonesia. Therefore, U.S. elasticity estimates by Stone [26], Deardorff and Stern [9], and Cline et al. [8] are adjusted following Balassa and Kreinin [6] using individual import to domestic consumption ratios as a weight.[a]

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[a] In deriving import-demand elasticities for Canada, Balassa [5, 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, and M = imports.

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 [13]). Khan [16] 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 [29] estimates for German data for manufactured goods are only slightly lower than the average at 1.133 for SITC 5–9. Because of the general consistency of results, 1.5 is used in all countries for all manufactured goods.

The elasticity of substitution in import demand also has few empirical estimates [25]. 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 [12], as cited in Cline et al. [8], find estimates ranging between 1.13 and 1.73. However, Cline et al. [8] shows that these estimates are biased downward due to product aggregation. Other studies (Armington [2]) use the scalar 3 but do not offer any theoretical justification. Cline et al. [8] uses 2.5 for all product categories as a compromise. Because this study, as is common to other studies using the Armington approach, finds the results to be most sensitive to this parameter, a conservative substitution elasticity of 2 is used in this study for trade among ASEAN countries.

Disaggregated supply elasticities for the ASEAN countries are not found in the literature, though Khan [16] finds that the overall export-supply elasticity of the Philippines is very low at 0.751. A simple OLS regression on the log of output and prices was used to estimate these elasticities with a minimum value of 0.5. As time-series data were not available for Indonesia, estimates for the Philippines were used.

Sensitivity analyses on the various elasticity and growth parameters indicate the following: (1) Assuming higher rates of income growth increase population growth by a comparable amount in percentage terms, except when the change in production is small. In other words, a 60 per cent decrease in the rate of income growth (from 0.05 to 0.02) generates a 60 per cent 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. Shares of non-partner countries increase by more than partner countries 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 but 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) Large changes in supply elasticities have little effect on trade growth except in countries where the propensity to trade is large. A change in supply elasticities from 0.5 to 2 causes a change in expected import growth of about 10 to 20 per cent. Increasing the supply elasticity to 10 also causes a change in imports of about 10 to 20 per cent

over the situation where gamma was set at 2. The change in the supply elasticity has a more significant effect on production in Malaysia and Singapore where trade is important relative to total production. The increase in production is mainly absorbed in the domestic market though imports of other countries from Singapore do increase. (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 per cent, 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 per cent change in price elasticity results in about a 25 per cent change in the absolute value of the expected change in imports. However, since the percentage changes predicted by the model simply become 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.