Dynamic Comparative Advantage of the Asean Countries

Noor Aini Khalifah

ABSTRACT

This paper examines revealed comparative advantage of the ASEAN countries for the period 1985-1990. Two indices were used simultaneously to evaluate comparative advantage: the world-export share index and the export-import ratio. The results show that Malaysia and Indonesia possess comparative advantage in primary products. Thailand's comparative advantage in the crops and animal product group is foremost (though declining) followed by Malaysia, Indonesia and Phillipines. In the manufacture of labour intensive goods, Thailand and Phillipines are at a comparative advantage with Indonesia acquiring comparative advantage in 1990. None of the ASEAN countries possess comparative advantage in the moderately and highly capital and skill intensive manufactured goods category although Singapore is least disadvantaged. In order for Malaysia to remain competitive and acquire competitiveness in new sectors, the known strategies for success must be intensified and "new" strategies must be found to stay ahead.

ABSTRAK

Kajian ini meneliti faedah berbanding ternyata bagi negara ASEAN untuk jangka masa 1985-1990. Dua indeks diguna serentak untuk menilai faedah berbanding iaitu indeks bahagian eksport dunia dan nisbah eksport-import. Keputusan kajian menunjukkan Malaysia dan Indonesia mempunyai faedah berbanding yang paling tinggi dalam pengeluaran tanaman dan produk daripada haiwan dan ini diikuti oleh Malaysia, Indonesia dan Filipina. Dalam pengeluaran perkilangan yang berintensifkan buruh; Thailand dan Filipina mempunyai faedah berbanding dan Indonesia memperoleh faedah berbanding pada tahun 1990. Bagi perdagangan dalam kumpulan barang perkilangan yang berintensifkan modal dan kemahiran, kesemua negara ASEAN tidak mempunyai faedah berbanding. Malaysia dalam usahanya untuk terus

*berdaya saing terpaksa memperhebatkan lagi strategi yang telah
terbukti membawa kejayaan dan pada masa yang sama cuba mencari
strategi baru untuk terus maju.*

INTRODUCTION

The early nineties witnessed the flourishing of regional groupings
and the belief that belonging to the correct regional grouping will
lead to success in global trade. The member countries of ASEAN
have demonstrated an expansion in world trade that rank among
the highest in the world. The past two decades have witnessed rapid
rates of economic growth in the ASEAN countries which partly can
be attributed to a vigourous industrialization programme. Export
oriented industrialization has been the goal of the ASEAN countries
with specific emphasis on the expansion of manufactured exports.
The need for economic regionalism among the ASEAN countries is
quite obvious but the means and speed to achieve that goal differs
among them. This paper seeks to empirically measure and evaluate
the commodity pattern of comparative advantage of the ASEAN
countries between 1986 and 1990 (the availability of data determines
the end period of the study) for different trade aggregates.

DATA AND METHODOLOGY

The concept of comparative advantage is central to international
trade theory but this concept is based upon autarkic prices which
are not observable in post-trade equilibrium. In order to quantify
international differences in comparative advantage, the literature
(Balassa 1965; Balassa 1977; Donges and Riedel 1977; Yeats 1985
and UNIDO 1982) reports numerous alternative indices. These
indices are based on post-trade equilibria or as revealed by trade
patterns yielding the term revealed comparative advantage (RCA).
The underlying assumptions of these indices are that relative costs
as well as differences in non-price factors are reflected in the pattern
of commodity trade. Ballance, Forstner and Murray (1987) have
shown that RCA indices using only trade data yield more consistent
results and ranking than RCA indices based on production and trade
data. This paper specifically analyzes comparative advantage based
on three indices of RCA: first, the net export to total trade ratio

(nx$_{ij}$); second, the world export share (WES$_{ij}$) also called the export performance ratio and third, the export import ratio (EIR$_{ij}$). UNIDO (1982) provides an application of the first measure.

$$nx_{ij} = (X_{ij} - M_{ij})/(X_{ij} + M_{ij}) \tag{1}$$

The second measure, world export share is as shown in Balassa (1965).

$$WES_{ij} = (X_{ij}/X_i)/(X_{wj}/X_w) \tag{2}$$

The third measure, the export import ratio also introduced by Balassa (1965) is as follows:

$$EIR_{ij} = (X_{ij}/M_{ij})/(X_{wj}/M_{wj}) \tag{3}$$

where X_{ij} (M_{ij}) represent the value of country i's export (import) of commodity j where j $= 1, \ldots,$ k. Let X_i (M_i) represent the value of country i's total exports (imports), and the subscript w represent the world.

The net export to total trade measure yields values ranging from -1 where a commodity is imported but not exported, to $+1$, where a commodity is exported but not imported. This measure of comparative advantage has been subject to criticism since import levels are greatly influenced by the system of protection.

The second ratio is an indication of the extent of commodity specialization in a country's exports relative to the share of that commodity in world exports. A ratio of unity shows that export specialization of a particular commodity (j) for a country (i) is equivalent to the global average. A ratio of two indicates that the share of commodity j in country i's exports is twice the global average. The world export share index does not include any import variables and thus corrects the problem associated with domestic market protection.

The third measure examines the ratio of exports to imports of a particular commodity deflated by world exports and imports respectively of the particular commodity. Again as in equation (2), if the ratio is greater than unity, country i is said to have comparative advantage in exporting good j.

In order to assess changes in the structure of comparative advantage over the period studied, the WES$_{ij}$ vector was correlated for the period 1986 and 1990. If the correlation coefficient is significantly different from unity, it can be interpreted that the

structure of comparative advantage has changed over the period examined (Rana 1988).

Countries can gain comparative advantage in "sunrise" or "sunset" industries. If a country gains comparative advantage in booming industries, then it can be said that the gain in comparative advantage is "beneficial" to the country. It is to the benefit of a country if it gains comparative advantage in commodities where the world market for the commodities are increasing relatively fast and vice versa. World market growth is proxied by the rate of growth of world imports in two digit SITC items between 1986 and 1990. We then correlated world market growth of imports with changes in the WES vector over the period 1986 and 1990. Positive correlation between changes in the WES vector and growth of world imports vector implies that a country gained comparative advantage in commodities with growing world demand. A negative correlation would mean that countries gained comparative advantage in declining industries.

The WES_{ij} measure obviates the use of import data and the problem of domestic market protection although it is not necessarily free from policy interventions since exports can also be influenced by policy interventions of both exporting and importing countries. The EIR_{ij} vector which incorporates import data is directly influenced by protective measures in country i with respect to commodity j and by protection in the rest of the world through its impact on X_{ij}. In relative terms, the WES vector is less likely to be influenced by protective measures at home and abroad and therefore can be taken to be a measure of inherent or potential pattern of comparative advantage. The EIR measure can be used to depict a country's realized comparative advantage given the existing structure of protectionism. Accordingly, it can be interpreted that if the EIR vector approaches the WES vector (i.e. the correlation coefficient between the two vectors increases) for a given period, the potential for exporting the commodities has been realized and this is a sign that net protection has decreased.

The paper thus sets out to measure comparative advantage according to the three different indices as stated above. It also tabulates the correlation coefficients to assess changes in the structure of comparative advantage, changes in comparative advantage in relation to growth of world imports and lastly whether net protection has increased or not for different groups of

commodities. The above measures were computed based on the 2-digit SITC Revision 2 data. We aggregated the 2-digit data into five groups (see Appendix), namely non-manufactures which consisted of primary products (pp) and crops and animal products (pca); manufactures which are labour intensive (mli), manufactures which are moderately capital and skill intensive (mmc) and manufactures which are highly capital and skill intensive (mhc) (Appendix in Rana 1988). At the two digit level there exist 63 industries between SITC 0 and SITC 8.[1] There are 30 commodities[2] at the 2-digit level in the non-manufactures category while 32 commodities are classified as manufactures.

STRUCTURE OF ASEAN COUNTRIES TRADE

Singapore is the largest trader among the ASEAN countries over the period examined. This can be partly attributed to the country's entreport trade. Although data for the Phillipines are incomplete (Table 1), we still can infer that the Phillipines is the smallest trader among the ASEAN countries. Thailand is the second smallest trader among the ASEAN countries in 1986. Indonesia ranked second in terms of trade value in the same year. Malaysia and Indonesia traded roughly the same amount in 1986 but by 1990, Malaysia's trade was more than double that of 1986 while Indonesia's trade incresed slightly less than two fold over the same period. Thailand experienced the highest rate of expansion in trade among the ASEAN countries with trade in 1990 being three times that of 1986. By 1990, Malaysia ranked second in terms of absolute value of trade, followed very closely by Thailand which ranked third.

The exports of the ASEAN countries classified by the different groupings are shown in Table 2. The share of primary products (especially petroleum and related products) in the exports of Indonesia is relatively high compared to Thailand. Malaysia occupies an intermediate position between Thailand and Indonesia where exports of primary products are concerned. Thailand is relatively the largest exporter of crops and animal products although the share of crops and animal products continuously declined. This decline is being offset by the continuous increase in the share of labour intensive and moderately capital and skill intensive manufactures. Malaysia, Indonesia and Thailand's exports

TABLE 1. Exports and imports of the ASEAN countries
(Thousands of $US)

Country		1986	1987	1988	1989	1990
Indonesia	X	14,774,922	16,860,813	18,900,483	21,771,027	25,551,147
	M	10,677,185	12,287,004	13,167,460	16,307,105	21,801,086
Malaysia	X	13,802,322	17,876,733	21,043,096	25,030,176	29,332,743
	M	10,692,139	12,550,671	16,183,122	21,599,560	27,775,454
Phillipines	X	3,533,860	-	4,971,218	-	-
	M	4,162,509	-	6,908,354	-	-
Singapore	X	21,058,889	27,019,242	37,635,876	44,051,054	52,029,403
	M	25,056,423	32,044,773	43,182,236	48,893,120	59,999,807
Thailand	X	8,757,317	11,552,814	15,839,913	19,817,448	22,792,913
	M	8,635,718	12,391,489	19,400,170	24,605,283	32,345,591

Notes: X denotes exports and M denotes imports.
Figures above are for SITC 0-8 only.
Source: Computed from the *Foreign Trade Statistics of Asia and the Pacific 1986-1990*, ESCAP United Nations.

of labour intensive and moderately capital and skill intensive products increased over the years studied. Throughout the study period, the share of manufactures in the exports of Singapore is the highest followed by Thailand, Malaysia, Phillipines and Indonesia. When comparing the export structure of manufactures between Thailand and Malaysia, the capital intensity and skill level of the manufactured exports of Malaysia is relatively higher than that of Thailand.[3]

Malaysia's share of manufactured imports (80.23%) relative to total imports of Malaysia is the largest among the ASEAN countries in 1990. Indonesia and Thailand's share of manufactured imports constitute 75 per cent of imports while that of Singapore is about 72 per cent. The bulk of the manufactured imports of the ASEAN countries is in the moderately capital and skill intensive group. The export oriented industrialization of the ASEAN countries in the manufacturing sector also promotes imports of manufactures as can be gleaned from Table 3. Singapore's share of imports of highly capital and skill intensive manufactures continuously increased over the period examined while the same share exhibited a declining trend for Thailand. Both Malaysia and Indonesia exhibited increasing percentages of imports for highly capital and skill

TABLE 2. Exports of the ASEAN countries according to the
different trade aggregates

Country	Year	%allpp	%allpca	%allmli	%allmmc	%allmhc
Indonesia	1986	60.8	29.28	4.73	3.43	1.76
	1987	55.34	33.55	4.8	4.82	1.49
	1988	47.28	37.23	6.99	6.67	1.83
	1989	46.74	33.74	9.29	7.95	2.27
	1990	48.37	28.85	11.8	8.57	2.42
Malaysia	1986	25.87	38.57	4.8	29.07	1.7
	1987	23.04	39.56	5.72	30.04	1.64
	1988	18.87	39.28	6.84	32.83	2.18
	1989	19.31	33.83	8.16	36.9	1.8
	1990	20.49	27.64	9.62	40.64	1.61
Phillipines	1986	15.28	45.83	16.93	15.07	6.89
	1988	17.16	40.59	19.55	17.51	5.18
Singapore	1986	24.09	14.76	7.06	47.9	6.19
	1987	18.84	13.32	7.97	53.24	6.63
	1988	16.19	12.64	7.33	56.97	6.87
	1989	18.22	10.86	7.13	57.19	6.6
	1990	19.98	8.98	7.03	57.72	6.28
Thailand	1986	2.99	54.22	20.4	20.78	1.61
	1987	2.33	47.28	26.93	21.78	1.67
	1988	2.56	44.04	26.58	25.17	1.65
	1989	2.18	41.93	27.87	26.35	1.66
	1990	1.9	35.06	29.58	31.51	1.95

Notes: pp refer to primary products.
pca refer to crops and animal products.
mli refer to labour-intensive manufactures.
mmc refer to moderately capital and skill-intensive manufactures.
mhc refer to highly capital and skill-intensive manufactures.
Source: *Foreign Trade Statistics of Asia and the Pacific 1986-1990*, ESCAP United
Nations.

intensive manufactures between 1986 and 1988; but between 1988
and 1990, the said percentages decreased.

TABLE 3. Imports of the ASEAN countries according to the
different trade aggregates

Country	Year	%allpp	%allpca	%allmli	%allmmc	%allmhc
Indonesia	1986	14.67	12.54	2.74	52.33	17.72
	1987	13.26	13.29	1.69	52.84	18.93
	1988	11.79	14.30	1.82	52.79	19.30
	1989	13.66	14.21	2.26	52.45	17.41
	1990	14.02	10.74	2.07	57.81	15.37
Malaysia	1986	11.54	16.18	4.37	58.18	9.73
	1987	10.88	15.53	4.07	59.14	10.38
	1988	9.61	14.99	3.89	60.39	11.12
	1989	9.43	13.10	3.76	64.63	9.08
	1990	9.04	10.73	3.93	67.55	8.75
Phillipines	1986	25.70	19.18	1.92	34.50	18.69
	1988	21.25	18.98	2.40	41.03	16.33
Singapore	1986	21.85	14.06	7.23	50.90	5.95
	1987	20.50	12.68	7.18	53.58	6.06
	1988	17.40	12.13	6.91	56.87	6.69
	1989	16.58	10.67	6.97	58.20	7.58
	1990	18.17	9.36	7.18	57.69	7.59
Thailand	1986	17.93	13.49	4.04	48.23	16.31
	1987	17.85	12.38	4.47	50.21	15.08
	1988	13.33	11.70	3.88	58.01	13.08
	1989	14.11	11.86	5.60	56.60	11.83
	1990	13.30	11.03	6.74	58.40	10.54

Source: Foreign Trade Statistics of Asia and the Pacific 1986-1990, ESCAP United
Nations.

REVEALED COMPARATIVE ADVANTAGE (RCA)

The net export to total trade (nx_{ij}) index of RCA will be examined
first. The nx_{ij} indices for the different trade aggregates of the ASEAN
countries are shown in Table 4. An overall picture of comparative
advantage can be obtained simply by looking at the positive and
negative signs for the different trade aggregates: A positive sign
indicates comparative advantage while a negative sign implies vice
versa. Table 5 presents comparative advantage indices based on the
world export share (WES_{ij}) measure while Table 6 shows

comparative advantage indices based on the export import ratio (EIR_{ij}). In the case of the WES_{ij} and EIR_{ij} indices, values greater than one indicate comparative advantage in commodity j for country i.

The WES ratio which does not include any import values can yield conclusions about comparative advantage which are different from the net export to total trade ratio. Commodities in which a country have a strong comparative advantage may be quite insensitve to the different measures used but the choice of index can influence conclusions on comparative advantage for commodities in which the comparative advantage or disadvantage is marginal.

Based on the nx_{ij} measure, Indonesia and Malaysia are at a comparative advantage where primary products trade is concerned while Singapore, Phillipines and Thailand are disadvantaged in primary products trade. Both Malaysia and Indonesia's comparative advantage in primary products can be attributed mainly to the products in SITC 33 (petroleum and petroleum products) and SITC 34 (gas, natural and manufactured). Indonesia and Phillipines are also comparatively advantaged in the production of other primary products like metaliferous ores and non-ferrous metals while Malaysia is relatively less well endowed with these primary products.

According to the WES index, the earlier conclusions about Malaysia and Indonesia's comparative advantage in petroleum and related products (SITC 33) and natural and manufactured gas (SITC 34) still hold. But Singapore which exhibited a marginal disadvantage in SITC 33 according to the nx_{ij} ratio switched positions to become comparatively advantaged according to the WES_{ij} measure with indices of 2.51, 2.01, 1.98, 2.09 and 2.39 for the respective years from 1986 to 1990. The WES indices for Singapore surpasses that of Malaysia in SITC 33. This apparent contradiction can be explained by Singapore's entreport trade position. Singapore imports more than it exports SITC 33 yielding a negative sign according to the net export to total trade ratio of comparative advantage. But Singapore's exports of SITC 33 as a proportion of its total exports is higher than the proportion of world exports of SITC 33 to total world exports thus resulting in a WES index of greater than unity.

Phillipines also showed conflicting results between the nx_{ij} and WES_{ij} indices for the category primary products. According to the

TABLE 4. Net export to total trade ratio of the ASEAN countries

SITC 2 digit	Trade agg	Indonesia					Malaysia					Phillipines		Singapore					Thailand				
		1986	1987	1988	1989	1990	1986	1987	1988	1989	1990	1986	1988	1986	1987	1988	1989	1990	1986	1987	1988	1989	1990
27	pp	-0.63	-0.63	-0.64	-0.66	-0.67	-0.47	-0.40	-0.50	-0.64	-0.67	-0.88	-0.72	-0.37	-0.42	-0.38	-0.21	-0.44	-0.19	-0.13	-0.39	-0.23	-0.19
28	pp	0.25	0.38	0.53	0.22	0.15	0.00	-0.06	-0.16	-0.37	-0.39	0.88	0.55	0.21	0.21	0.29	0.16	0.21	-0.74	-0.72	-0.71	-0.77	-0.85
32	pp	0.23	-0.49	-0.09	0.06	0.62	-0.38	-0.40	-0.97	-0.95	-0.99	-1.00	-1.00	-0.05	-0.13	-0.26	-0.38	-0.25	-0.97	-0.99	-1.00	-1.00	-1.00
33	pp	0.67	0.70	0.70	0.67	0.59	0.46	0.52	0.52	0.54	0.53	-0.88	-0.78	-0.05	-0.13	-0.11	-0.00	-0.01	-0.98	-0.96	-0.95	-0.94	-0.94
34	pp	1.00	1.00	1.00	1.00	1.00	0.95	0.93	0.92	0.91	0.90	0.10	-0.13	0.99	0.94	0.97	0.93	0.95	0.75	0.41	0.57	0.16	0.30
35	pp	-	-	-	-	-0.73	-	-	-1.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
68	pp	0.31	0.29	0.35	0.35	0.05	0.33	0.30	0.10	0.06	-0.13	0.57	0.41	-0.05	-0.23	-0.18	-0.07	-0.28	-0.02	-0.35	-0.58	-0.61	-0.71
	allpp	0.70	0.70	0.70	0.64	0.60	0.49	0.50	0.44	0.41	0.41	-0.33	-0.27	-0.04	-0.13	-0.10	-0.01	-0.02	-0.71	-0.78	-0.73	-0.78	-0.82
00	pca	-0.99	-0.82	-0.68	-0.60	-0.10	0.38	0.57	0.62	0.72	0.71	-0.97	-0.98	-0.80	-0.87	-0.90	-0.92	-0.93	-0.35	-0.81	-0.89	-0.93	-0.85
01	pca	0.36	0.37	0.59	0.50	0.22	-0.90	-0.78	-0.78	-0.75	-0.70	-0.81	-0.92	-0.63	-0.60	-0.56	-0.62	-0.63	0.98	0.98	0.98	0.98	0.98
02	pca	-1.00	-0.94	-0.87	-0.79	-0.62	-0.69	-0.63	-0.64	-0.67	-0.55	-0.95	-0.99	-0.45	-0.39	-0.40	-0.40	-0.40	-0.68	-0.60	-0.79	-0.79	-0.73
03	pca	0.96	0.99	0.99	0.99	0.99	0.11	0.18	0.21	0.18	0.25	0.89	0.81	-0.10	-0.03	-0.01	0.00	0.08	0.54	0.63	0.48	0.46	0.49
04	pca	-0.79	-0.88	-0.87	-0.75	-0.81	-0.87	-0.85	-0.82	-0.80	-0.75	-0.94	-0.94	-0.46	-0.37	-0.34	-0.30	-0.34	0.92	0.90	0.89	0.89	0.82
05	pca	0.45	0.63	0.48	0.56	0.61	-0.42	-0.34	-0.30	-0.25	-0.19	0.90	0.82	-0.46	-0.45	-0.47	-0.47	-0.48	0.97	0.97	0.96	0.94	0.92
06	pca	0.31	0.08	-0.18	-0.65	-0.53	-0.65	-0.52	-0.61	-0.42	-0.38	0.91	0.53	-0.74	-0.70	-0.61	-0.49	-0.54	1.00	1.00	0.98	0.99	0.99
07	pca	0.98	0.97	0.98	0.98	0.96	0.70	0.80	0.78	0.70	0.73	0.94	0.79	0.13	0.16	0.24	0.21	0.10	0.77	0.63	0.65	0.69	0.55
08	pca	-0.29	-0.28	-0.17	-0.37	-0.35	-0.10	-0.16	-0.14	-0.13	-0.03	-0.15	-0.48	-0.17	-0.12	-0.14	-0.09	-0.04	0.15	0.08	0.06	0.00	-0.12
09	pca	-0.51	-0.44	-0.59	-0.32	-0.16	-0.19	-0.10	0.04	-0.01	-0.08	0.35	0.09	-0.16	-0.12	0.04	0.22	0.08	0.12	0.15	0.28	0.34	0.41
11	pca	-0.87	-0.68	-0.14	0.03	0.23	-0.44	-0.32	-0.32	-0.23	-0.36	-0.31	-0.50	-0.23	-0.12	-0.09	-0.06	0.00	-0.79	-0.75	-0.60	-0.59	-0.67
12	pca	0.51	0.42	0.38	0.59	0.45	-0.94	-0.91	-0.64	-0.92	-0.73	-0.45	-0.50	-0.25	-0.32	-0.19	-0.07	-0.02	0.04	0.40	0.16	0.04	0.04
21	pca	1.00	0.95	0.52	0.59	-0.63	-0.63	-0.56	0.25	-0.06	-0.02	-0.51	-0.89	0.62	0.63	0.56	0.46	0.27	-0.11	-0.65	-0.80	-0.89	-0.95
22	pca	-0.96	-0.86	-0.96	-0.95	-0.95	-0.64	-0.61	-0.87	-0.84	-0.73	0.58	0.33	-0.30	-0.22	-0.31	-0.35	-0.34	0.81	0.80	0.00	0.52	0.23
23	pca	0.91	0.92	0.92	0.89	0.83	0.95	0.95	0.95	0.87	0.83	-0.07	-0.13	0.20	0.14	0.15	0.20	0.18	0.94	0.94	0.93	0.91	0.87
24	pca	1.00	1.00	1.00	0.99	0.87	0.99	0.99	0.99	0.99	0.99	0.99	0.97	0.17	0.27	0.29	0.35	0.16	-0.51	-0.62	-0.58	-0.77	-0.81
25	pca	-1.00	-0.97	-0.96	-0.79	-0.55	-0.75	-0.85	-0.73	-0.83	-0.80	-0.53	-0.53	0.37	0.38	0.27	0.36	0.19	-0.70	-0.84	-0.83	-0.76	-0.98
26	pca	-0.98	-0.98	-0.91	-0.92	-0.94	-0.41	-0.55	-0.60	-0.53	-0.59	-0.47	-0.58	-0.31	-0.25	-0.24	-0.31	-0.26	-0.89	-0.90	-0.88	-0.74	-0.76
29	pca	0.81	0.86	0.77	0.52	0.42	-0.67	-0.33	-0.27	-0.31	-0.43	0.43	0.30	0.02	0.13	0.14	0.09	0.08	0.56	0.44	0.39	0.34	0.33

(continued to next page)

TABLE 4. (*Continued*)

SITC 2 digit	Trade agg	Indonesia					Malaysia					Phillipines		Singapore					Thailand				
		1986	1987	1988	1989	1990	1986	1987	1988	1989	1990	1986	1988	1986	1987	1988	1989	1990	1986	1987	1988	1989	1990
41	pca	0.51	0.02	-0.17	0.04	0.24	-0.91	-0.91	-0.95	-0.64	-0.12	-0.06	-0.77	-0.62	0.09	-0.63	-0.46	-0.13	-0.19	-0.47	-0.90	-0.88	-0.94
42	pca	0.92	0.47	0.47	0.49	0.93	0.97	0.89	0.90	0.91	0.91	0.95	0.93	0.34	0.10	0.13	0.02	-0.07	0.45	0.62	-0.19	-0.45	-0.27
43	pca	0.53	0.71	0.82	0.72	0.81	0.92	0.98	0.98	0.98	0.98	0.78	0.83	-0.01	-0.07	-0.15	0.07	0.09	-0.48	-0.27	-0.71	-0.83	-0.86
63	pca	1.00	1.00	1.00	0.99	0.99	0.93	0.96	0.95	0.95	0.90	0.99	0.97	0.39	0.31	0.31	0.29	0.11	0.93	0.95	0.86	0.83	0.70
64	pca	-0.59	-0.20	-0.05	-0.02	-0.11	-0.83	-0.77	-0.62	-0.55	-0.56	-0.96	-0.92	-0.39	-0.39	-0.39	-0.38	-0.38	-0.56	-0.55	-0.62	-0.65	-0.74
	allpca	0.53	0.55	0.58	0.52	0.52	0.51	0.57	0.55	0.50	0.46	0.34	0.21	-0.06	-0.06	-0.05	-0.04	-0.09	0.61	0.56	-0.51	0.48	0.38
66	mli	-0.44	-0.09	0.24	0.17	0.07	-0.25	-0.01	0.04	0.06	-0.04	-0.14	-0.31	-0.66	-0.60	-0.56	-0.47	-0.45	0.32	0.25	0.25	-0.03	-0.14
82	mli	-0.04	0.62	0.78	0.87	0.79	0.19	0.39	0.54	0.62	0.59	0.97	0.98	-0.12	0.08	0.17	0.20	0.07	0.90	0.93	0.92	0.90	0.91
83	mli	-0.55	0.30	0.62	0.75	0.88	-0.56	-0.37	-0.47	-0.35	-0.08	0.88	0.84	-0.56	-0.55	-0.52	-0.79	-0.78	0.94	0.97	0.97	0.90	0.95
84	mli	0.99	0.98	0.98	0.98	0.98	0.82	0.87	0.89	0.89	0.89	0.98	0.97	0.30	0.32	0.35	0.34	0.27	0.99	0.99	0.99	0.99	0.98
85	mli	0.13	0.85	0.93	0.98	0.99	0.42	0.50	0.55	0.62	0.65	0.99	0.96	-0.64	-0.46	-0.44	-0.45	-0.45	0.99	0.99	0.99	0.99	0.98
89	mli	-0.09	-0.08	0.26	0.18	0.12	-0.34	-0.17	-0.09	0.06	0.20	0.51	0.46	-0.12	-0.08	-0.11	-0.13	-0.15	0.45	0.50	0.46	0.47	0.39
	allmli	0.41	0.59	0.69	0.69	0.74	0.17	0.33	0.39	0.43	0.44	0.77	0.71	-0.10	-0.03	-0.04	-0.04	-0.08	0.67	0.70	0.70	0.60	0.51
61	mmc	0.67	0.85	0.60	0.10	-0.37	-0.01	0.02	-0.00	-0.30	-0.32	-0.64	-0.73	-0.39	-0.44	-0.33	-0.36	-0.42	0.62	0.66	0.49	0.25	0.15
62	mmc	-0.77	-0.41	-0.12	-0.01	-0.07	0.29	0.36	0.38	0.34	0.34	-0.78	-0.76	-0.33	-0.28	-0.27	-0.53	-0.31	0.27	0.27	0.26	0.21	0.12
65	mmc	0.23	0.38	0.38	0.25	0.23	-0.27	-0.29	-0.33	-0.44	-0.43	-0.66	-0.64	-0.41	-0.37	-0.36	-0.34	-0.33	0.24	0.13	0.11	0.00	0.02
67	mmc	-0.81	-0.57	-0.53	-0.42	-0.70	-0.63	-0.54	-0.63	-0.68	-0.74	-0.74	-0.78	-0.54	-0.56	-0.57	-0.56	-0.60	-0.77	-0.82	-0.81	-0.87	-0.90
69	mmc	-0.99	-0.94	-0.73	-0.61	-0.60	-0.62	-0.58	-0.54	-0.55	-0.52	-0.73	-0.71	-0.34	-0.36	-0.32	-0.28	-0.27	-0.44	-0.41	-0.50	-0.40	-0.40
71	mmc	-0.99	-1.00	-0.99	-0.98	-0.97	-0.45	-0.58	-0.50	-0.56	-0.57	-0.99	-0.99	-0.35	-0.37	-0.37	-0.28	-0.40	-0.97	-0.80	-0.80	-0.80	-0.86
72	mmc	-0.99	-1.00	-0.99	-0.99	-0.99	-0.71	-0.68	-0.74	-0.82	-0.87	-0.86	-0.93	-0.24	-0.29	-0.31	-0.30	-0.34	-0.83	-0.88	-0.94	-0.96	-0.96
73	mmc	-1.00	-1.00	-1.00	-1.00	-0.98	-0.84	-0.83	-0.85	-0.92	-0.91	-0.96	-0.97	-0.33	-0.52	-0.53	-0.32	-0.39	-0.85	-0.95	-0.89	-0.95	-0.86
74	mmc	-0.94	-0.99	-0.98	-0.97	-0.97	-0.62	-0.50	-0.46	-0.47	-0.59	-0.94	-0.95	-0.17	-0.17	-0.15	-0.14	-0.23	-0.61	-0.60	-0.60	-0.62	-0.59
75	mmc	-0.99	-0.99	-0.98	-1.00	-0.99	-0.83	-0.67	-0.53	-0.28	-0.01	-0.72	-0.56	0.36	0.38	0.40	0.37	0.36	-0.62	-0.46	0.29	0.02	0.17
76	mmc	-0.97	-0.95	-0.87	-0.73	-0.65	0.10	0.28	0.35	0.42	0.44	-0.58	-0.24	0.11	0.19	0.21	0.22	0.17	-0.95	-0.87	0.65	-0.14	0.03
77	mmc	-0.95	-0.95	-0.83	-0.79	-0.79	0.04	0.02	0.03	0.00	-0.04	0.10	0.07	-0.09	-0.12	-0.15	-0.13	-0.15	-0.06	-0.08	-0.10	-0.21	-0.25
78	mmc	-1.00	-0.99	-0.95	-0.94	-0.95	-0.85	-0.78	-0.90	-0.81	-0.82	-0.30	-0.86	-0.39	-0.48	-0.51	-0.47	-0.47	-0.90	-0.89	-0.79	-0.81	-0.83

TABLE 4. (*Continued*)

SITC 2 digit	Trade agg	Indonesia 1986	1987	1988	1989	1990	Malaysia 1986	1987	1988	1989	1990	Phillipines 1986	1988	Singapore 1986	1987	1988	1989	1990	Thailand 1986	1987	1988	1989	1990
79	mmc	-0.93	-0.87	-0.84	-0.91	-0.85	-0.44	-0.14	-0.25	-0.45	-0.45	-0.86	-0.99	-0.39	-0.38	-0.23	-0.35	-0.40	-0.44	-0.94	-0.98	-0.87	-0.98
81	mmc	-0.77	-0.53	-0.12	-0.14	-0.26	-0.77	-0.42	-0.26	-0.17	-0.27	-0.18	0.37	-0.62	-0.55	-0.50	-0.46	-0.51	0.26	0.39	0.33	0.29	0.39
87	mmc	-0.67	-0.98	-0.98	-0.98	-0.96	-0.52	-0.51	-0.40	-0.43	-0.42	-0.99	-0.98	-0.21	-0.15	-0.17	-0.19	-0.18	-0.86	-0.85	-0.75	-0.76	-0.68
88	mmc	-0.83	-0.78	-0.75	-0.61	-0.53	-0.42	-0.45	-0.46	-0.38	-0.35	-0.73	-0.63	-0.37	-0.38	-0.33	-0.27	-0.31	-0.39	-0.49	-0.42	-0.34	-0.12
	allmmc	-0.83	-0.78	-0.69	-0.66	-0.70	-0.22	-0.16	-0.17	-0.20	-0.22	-0.46	-0.53	-0.12	-0.09	-0.07	-0.06	-0.07	-0.39	-0.42	-0.48	-0.46	-0.45
51	mhc	-0.93	-0.87	-0.90	-0.82	-0.84	-0.55	-0.60	-0.45	-0.52	-0.55	-0.50	-0.52	0.14	0.16	0.12	0.20	0.17	-0.86	-0.87	-0.92	-0.92	-0.88
52	mhc	-0.83	-0.87	-0.83	-0.84	-0.87	-0.81	-0.79	-0.77	-0.80	-0.82	-0.75	-0.65	-0.39	-0.37	-0.34	-0.40	-0.37	-0.83	-0.87	-0.90	-0.90	-0.86
53	mhc	-0.85	-0.95	-0.89	-0.81	-0.78	-0.80	-0.81	-0.78	-0.74	-0.69	-0.99	-0.96	-0.29	-0.27	-0.22	-0.07	-0.09	-0.86	-0.84	-0.85	-0.83	-0.83
54	mhc	-0.70	-0.68	-0.63	-0.74	-0.76	-0.70	-0.65	-0.67	-0.66	-0.64	-0.85	-0.92	0.02	-0.02	-0.03	-0.03	0.02	-0.82	-0.81	-0.74	-0.79	-0.77
55	mhc	-0.19	-0.30	-0.19	0.08	0.13	-0.58	-0.51	-0.48	-0.42	-0.40	-0.66	-0.63	-0.35	-0.29	-0.23	-0.28	-0.25	-0.63	-0.60	-0.52	-0.52	-0.52
56	mhc	0.69	0.27	0.24	0.17	0.33	-0.64	-0.54	-0.60	-0.46	-0.58	0.09	-0.30	0.06	0.10	-0.00	0.06	-0.03	-1.00	-1.00	-1.00	-1.00	-0.99
57	mhc	-1.00	-1.00	-1.00	-0.97	-0.99	-0.74	-0.72	-0.86	-0.75	-0.53	-0.29	-0.09	-0.54	-0.45	-0.50	-0.31	-0.29	-1.00	-0.98	-0.99	-0.95	-0.80
58	mhc	-0.99	-0.95	-0.89	-0.88	-0.87	-0.85	-0.83	-0.84	-0.85	-0.86	-0.77	-0.77	-0.07	-0.04	-0.04	-0.06	-0.09	-0.70	-0.74	-0.77	-0.71	-0.70
59	mhc	-0.94	-0.93	-0.92	-0.88	-0.80	-0.29	-0.33	-0.21	-0.36	-0.61	-0.64	-0.68	-0.10	-0.05	-0.12	-0.41	-0.51	-0.77	-0.72	-0.58	-0.54	-0.47
	allmhc	-0.76	-0.81	-0.76	-0.70	-0.69	-0.63	-0.63	-0.59	-0.63	-0.68	-0.52	-0.63	-0.07	-0.04	-0.06	-0.12	-0.17	-0.82	-0.81	-0.81	-0.80	-0.77

Notes: pp refer to primary products.
pca refer to crops and animal products.
mli refer to labour-intensive manufactures.
mmc refer to moderately capital and skill-intensive manufactures.
mhc refer to highly capital and skill-intensive manufactures.
Source: Computed from the models.

TABLE 5. World export share of the ASEAN countries

SITC 2 digit	Trade agg	Indonesia					Malaysia					Phillipines		Singapore					Thailand				
		1986	1987	1988	1989	1990	1986	1987	1988	1989	1990	1986	1988	1986	1987	1988	1989	1990	1986	1987	1988	1989	1990
27	pp	0.28	0.37	0.35	0.42	0.46	0.31	0.32	0.27	0.20	0.19	0.30	0.49	0.19	0.14	0.14	0.21	0.16	0.73	0.83	1.54	1.03	1.08
28	pp	1.69	1.59	2.76	2.40	2.12	0.64	0.66	0.64	0.47	0.41	6.14	6.27	0.41	0.43	0.43	0.34	0.32	0.16	0.23	0.29	0.17	0.11
32	pp	0.31	0.27	0.39	0.66	1.28	0.09	0.09	0.01	0.01	0.00	0.00	0.00	0.02	0.02	0.01	0.01	0.02	0.00	0.00	0.00	0.00	0.00
33	pp	4.27	4.33	4.11	3.75	3.78	2.00	1.88	1.86	1.77	1.95	0.18	0.40	2.51	2.01	1.98	2.09	2.39	0.02	0.03	0.04	0.05	0.05
34	pp	15.96	16.29	16.82	16.76	18.80	4.61	4.65	4.43	4.43	4.51	0.27	0.55	0.19	0.18	0.23	0.17	0.18	0.55	0.52	0.67	0.55	0.60
35	pp	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
68	pp	1.21	1.22	1.20	1.27	0.82	1.05	1.08	0.88	0.94	0.71	2.94	2.58	0.70	0.56	0.92	0.82	0.52	0.84	0.48	0.31	0.32	0.24
	allpp	4.25	4.10	3.91	3.62	3.83	1.81	1.71	1.56	1.49	1.62	1.07	1.42	1.68	1.40	1.34	1.41	1.58	0.21	0.17	0.21	0.17	0.15
00	pca	0.00	0.06	0.10	0.12	0.23	0.86	1.30	1.66	1.82	2.05	0.01	0.01	0.09	0.08	0.06	0.05	0.05	0.21	0.09	0.05	0.02	0.04
01	pca	0.10	0.08	0.14	0.08	0.06	0.03	0.05	0.04	0.04	0.05	0.01	0.01	0.13	0.13	0.12	0.10	0.08	1.45	1.47	1.25	1.20	1.31
02	pca	0.00	0.01	0.03	0.06	0.10	0.17	0.19	0.23	0.22	0.29	0.12	0.02	0.26	0.28	0.30	0.30	0.24	0.24	0.28	0.12	0.11	0.16
03	pca	2.09	2.36	3.17	3.43	3.70	0.89	0.87	0.83	0.82	0.75	5.20	7.52	0.87	0.95	0.85	0.80	0.77	9.94	9.33	9.40	9.71	9.66
04	pca	0.15	0.08	0.06	0.15	0.09	0.09	0.10	0.13	0.15	0.18	0.10	0.10	0.19	0.21	0.21	0.21	0.17	8.44	6.79	6.33	6.06	4.06
05	pca	0.35	0.48	0.65	0.48	0.61	0.37	0.34	0.38	0.37	0.35	6.11	5.52	0.46	0.40	0.36	0.31	0.27	7.40	6.36	5.54	4.86	4.21
06	pca	0.43	0.42	0.32	0.24	0.33	0.35	0.46	0.41	0.71	0.73	4.92	3.41	0.06	0.08	0.11	0.13	0.12	5.81	5.91	5.29	8.16	6.78
07	pca	5.46	5.45	5.58	5.08	4.53	1.58	2.23	2.12	1.65	1.57	2.52	1.35	1.99	1.93	1.83	1.37	1.14	0.60	0.44	0.40	0.54	0.41
08	pca	0.83	0.79	0.77	0.82	0.77	0.93	0.69	0.67	0.76	0.75	3.69	2.15	0.35	0.31	0.25	0.23	0.17	1.83	1.74	1.54	1.47	1.39
09	pca	0.12	0.16	0.11	0.20	0.25	1.19	1.06	1.01	0.88	0.72	0.81	0.96	0.71	0.70	1.02	1.12	0.82	1.18	1.15	1.19	1.22	1.19
11	pca	0.00	0.01	0.03	0.05	0.06	0.15	0.18	0.18	0.17	0.13	0.14	0.17	0.56	0.62	0.62	0.65	0.82	0.05	0.07	0.16	0.18	0.19
12	pca	0.98	0.90	0.73	1.00	0.87	0.02	0.02	0.07	0.01	0.05	1.56	1.14	0.77	0.57	0.70	1.26	1.62	1.36	0.92	0.72	0.56	0.56
21	pca	0.62	0.12	0.10	0.08	0.02	0.01	0.01	0.03	0.03	0.02	0.01	0.00	0.31	0.32	0.33	0.21	0.17	0.50	0.26	0.15	0.08	0.06
22	pca	0.04	0.12	0.04	0.05	0.06	0.26	0.24	0.09	0.12	0.23	1.28	1.47	0.31	0.29	0.24	0.24	0.26	0.34	0.28	0.25	0.15	0.26
23	pca	12.49	14.53	15.52	13.71	11.75	23.14	22.20	22.50	17.25	13.43	0.74	0.70	7.57	6.94	7.12	6.56	5.33	16.94	17.66	16.08	15.33	14.21
24	pca	2.27	2.70	3.48	4.50	1.29	14.06	14.75	12.83	12.61	11.43	4.76	3.89	0.99	0.98	0.83	0.89	0.62	0.33	0.32	0.39	0.29	0.29
25	pca	0.01	0.03	0.04	0.24	0.53	0.02	0.01	0.02	0.01	0.02	0.61	0.50	0.18	0.15	0.15	0.10	0.10	0.21	0.11	0.10	0.14	0.01
26	pca	0.02	0.03	0.12	0.12	0.12	0.26	0.23	0.20	0.25	0.23	1.31	1.03	0.11	0.13	0.12	0.10	0.14	0.19	0.21	0.21	0.50	0.58
29	pca	1.83	2.45	1.48	0.63	0.62	0.14	0.30	0.32	•0.29	0.18	1.86	1.68	1.38	1.48	1.31	1.05	0.85	2.32	1.58	1.24	1.15	1.05

(continued to next page)

TABLE 5. (*Continued*)

SITC 2 digit	Trade agg	Indonesia					Malaysia					Phillipines		Singapore					Thailand				
		1986	1987	1988	1989	1990	1986	1987	1988	1989	1990	1986	1988	1986	1987	1988	1989	1990	1986	1987	1988	1989	1990
41	pca	0.89	0.42	0.27	0.41	0.84	0.01	0.01	0.00	0.02	0.06	1.78	0.22	0.03	0.07	0.02	0.06	0.20	0.09	0.07	0.03	0.04	0.03
42	pca	2.38	4.15	6.85	5.47	4.03	26.98	23.20	23.93	21.62	17.70	26.58	23.11	2.06	1.91	1.69	1.53	1.16	0.24	0.28	0.12	0.08	0.08
43	pca	3.08	4.34	5.43	2.65	4.77	7.34	20.76	26.39	23.27	22.02	3.32	4.49	16.20	10.63	7.62	8.71	6.44	0.18	0.30	0.09	0.05	0.05
63	pca	16.39	21.85	22.56	21.58	21.37	3.18	3.61	3.06	2.94	2.99	7.20	6.82	2.07	1.99	1.84	1.33	0.92	2.03	2.39	1.59	1.43	1.17
64	pca	0.12	0.29	0.35	0.39	0.30	0.09	0.11	0.21	0.26	0.25	0.03	0.05	0.34	0.34	0.32	0.31	0.29	0.21	0.23	0.15	0.12	0.10
	allpca	1.72	2.01	2.22	2.08	1.85	2.27	2.37	2.34	2.09	1.77	2.69	2.42	0.87	0.80	0.75	0.67	0.58	3.19	2.84	2.62	2.58	2.25
66	mli	0.19	0.26	0.44	0.51	0.42	0.25	0.30	0.36	0.42	0.42	0.24	0.29	0.19	0.21	0.20	0.23	0.27	2.04	2.19	1.83	1.81	2.05
82	mli	0.08	0.21	0.45	0.91	1.25	0.17	0.25	0.37	0.56	0.65	3.40	4.51	0.59	0.59	0.55	0.55	0.41	1.11	1.49	1.85	1.64	1.52
83	mli	0.02	0.04	0.09	0.22	0.34	0.07	0.08	0.07	0.09	0.18	1.85	2.00	0.53	0.59	0.63	0.22	0.21	1.78	3.45	4.10	4.17	4.38
84	mli	1.27	1.16	1.45	1.76	2.14	1.07	1.12	1.36	1.42	1.47	2.96	3.04	1.15	1.22	1.13	1.05	1.00	3.39	4.28	4.19	4.12	4.06
85	mli	0.07	0.18	0.60	1.36	2.80	0.21	0.26	0.33	0.38	0.42	1.15	1.26	0.12	0.17	0.19	0.17	0.17	1.72	2.52	3.17	3.47	4.17
89	mli	0.20	0.11	0.26	0.27	0.22	0.30	0.36	0.41	0.56	0.78	1.35	1.36	0.85	0.89	0.78	0.73	0.68	1.26	1.54	1.49	1.69	1.65
	allmli	0.48	0.46	0.66	0.85	1.04	0.48	0.55	0.64	0.75	0.85	1.71	1.84	0.71	0.76	0.69	0.65	0.62	2.06	2.57	2.50	2.55	2.60
61	mmc	0.25	0.59	0.83	0.76	0.66	0.06	0.07	0.09	0.07	0.10	0.18	0.11	0.11	0.11	0.17	0.16	0.17	1.94	2.48	2.33	2.10	2.55
62	mmc	0.10	0.18	0.31	0.41	0.36	0.56	0.68	0.72	0.74	0.80	0.12	0.17	0.38	0.42	0.40	0.42	0.37	0.89	0.83	0.80	0.88	0.94
65	mmc	0.64	0.83	1.14	1.27	1.59	0.46	0.43	0.45	0.42	0.42	0.39	0.47	0.62	0.70	0.58	0.58	0.56	1.81	1.67	1.52	1.31	1.31
67	mmc	0.13	0.34	0.38	0.49	0.27	0.20	0.26	0.24	0.22	0.23	0.26	0.34	0.26	0.25	0.25	0.27	0.25	0.26	0.24	0.30	0.21	0.18
69	mmc	0.01	0.03	0.10	0.19	0.21	0.17	0.19	0.24	0.26	0.33	0.12	0.15	0.56	0.52	0.56	0.58	0.61	0.34	0.42	0.43	0.53	0.59
71	mmc	0.01	0.00	0.01	0.01	0.02	0.22	0.22	0.22	0.20	0.20	0.01	0.00	0.57	0.61	0.59	0.68	0.59	0.02	0.12	0.15	0.17	0.19
72	mmc	0.01	0.00	0.01	0.01	0.02	0.16	0.15	0.18	0.15	0.12	0.08	0.07	0.47	0.44	0.50	0.52	0.51	0.11	0.09	0.06	0.05	0.06
73	mmc	0.00	0.00	0.00	0.00	0.01	0.04	0.05	0.05	0.05	0.07	0.01	0.02	0.30	0.28	0.30	0.46	0.39	0.05	0.03	0.10	0.06	0.16
74	mmc	0.04	0.01	0.01	0.02	0.02	0.23	0.28	0.34	0.38	0.29	0.03	0.03	0.86	0.86	0.91	0.92	0.72	0.29	0.35	0.40	0.34	0.43
75	mmc	0.00	0.00	0.00	0.00	0.00	0.03	0.05	0.08	0.23	0.56	0.04	0.10	2.67	3.19	3.46	3.69	4.27	0.20	0.35	0.79	1.29	1.66
76	mmc	0.01	0.01	0.03	0.07	0.13	1.19	1.57	2.04	2.93	3.38	0.10	0.43	2.55	3.37	3.70	3.75	3.77	0.03	0.07	0.21	0.86	1.43
77	mmc	0.02	0.02	0.04	0.06	0.06	3.47	3.18	3.03	3.00	2.95	2.01	1.92	2.72	2.62	2.32	2.01	1.89	1.57	1.52	1.45	1.11	1.16
78	mmc	0.00	0.00	0.01	0.01	0.02	0.02	0.02	0.01	0.04	0.04	0.08	0.04	0.06	0.06	0.07	0.10	0.10	0.02	0.03	0.09	0.09	0.10

TABLE 5. (*Continued*)

SITC 2 digit	Trade agg	Indonesia					Malaysia					Phillipines		Singapore					Thailand				
		1986	1987	1988	1989	1990	1986	1987	1988	1989	1990	1986	1988	1986	1987	1988	1989	1990	1986	1987	1988	1989	1990
79	mmc	0.05	0.05	0.05	0.04	0.09	0.47	0.52	0.29	0.48	0.65	0.02	0.00	0.83	0.74	0.81	0.78	0.51	0.11	0.01	0.02	0.02	0.01
81	mmc	0.05	0.14	0.19	0.20	0.19	0.07	0.13	0.19	0.21	0.19	0.27	0.36	0.24	0.20	0.20	0.26	0.23	0.36	0.36	0.45	0.56	0.64
87	mmc	0.12	0.01	0.01	0.01	0.02	0.21	0.21	0.27	0.30	0.37	0.00	0.01	0.69	0.78	0.76	0.70	0.71	0.06	0.07	0.13	0.12	0.17
88	mmc	0.04	0.04	0.06	0.10	0.14	0.29	0.28	0.32	0.42	0.54	0.09	0.14	0.67	0.67	0.89	1.00	1.08	0.39	0.31	0.39	0.54	0.82
	allmmc	0.07	0.10	0.13	0.16	0.17	0.59	0.60	0.65	0.73	0.79	0.30	0.34	0.97	1.07	1.12	1.13	1.13	0.42	0.44	0.50	0.52	0.62
51	mhc	0.06	0.10	0.08	0.15	0.15	0.17	0.14	0.24	0.18	0.18	0.80	0.71	0.86	0.85	0.80	0.85	0.91	0.14	0.15	0.08	0.07	0.11
52	mhc	0.20	0.19	0.22	0.21	0.16	0.10	0.10	0.13	0.12	0.11	0.45	0.59	0.21	0.22	0.26	0.23	0.26	0.10	0.08	0.06	0.06	0.09
53	mhc	0.12	0.04	0.08	0.17	0.22	0.06	0.06	0.08	0.12	0.15	0.02	0.04	0.48	0.45	0.49	0.66	0.64	0.18	0.21	0.18	0.21	0.21
54	mhc	0.10	0.10	0.11	0.07	0.06	0.13	0.12	0.12	0.12	0.11	0.15	0.09	0.57	0.47	0.40	0.38	0.34	0.11	0.11	0.13	0.10	0.10
55	mhc	0.59	0.44	0.46	0.78	0.90	0.33	0.33	0.36	0.36	0.40	0.34	0.38	0.72	0.76	0.83	0.67	0.61	0.28	0.32	0.33	0.29	0.29
56	mhc	2.00	1.23	1.50	1.87	2.06	0.38	0.51	0.53	0.70	0.53	7.44	2.97	0.36	0.35	0.29	0.16	0.15	0.01	0.01	0.00	0.00	0.02
57	mhc	0.00	0.00	0.00	0.02	0.00	0.13	0.13	0.07	0.12	0.24	0.88	1.01	0.36	0.38	0.52	0.58	0.62	0.00	0.01	0.00	0.01	0.05
58	mhc	0.01	0.04	0.10	0.10	0.12	0.07	0.08	0.09	0.09	0.09	0.29	0.29	0.80	0.95	1.10	0.90	0.80	0.27	0.22	0.20	0.25	0.28
59	mhc	0.03	0.06	0.06	0.09	0.14	0.48	0.41	0.57	0.36	0.22	0.41	0.42	0.87	0.82	0.73	1.06	0.94	0.25	0.29	0.45	0.48	0.55
	allmhc	0.19	0.16	0.19	0.25	0.27	0.19	0.17	0.23	0.20	0.18	0.76	0.54	0.68	0.71	0.72	0.72	0.69	0.18	0.18	0.17	0.18	0.21

Source: Computed from the models.

TABLE 6. Export import-ratio of the ASEAN countries according to the different trade aggregates

SITC 2 digit	Trade agg	Indonesia					Malaysia					Phillipines		Singapore					Thailand				
		1986	1987	1988	1989	1990	1986	1987	1988	1989	1990	1986	1988	1986	1987	1988	1989	1990	1986	1987	1988	1989	1990
27	pp	0.24	0.24	0.23	0.21	0.21	0.38	0.45	0.35	0.23	0.21	0.07	0.17	0.48	0.43	0.47	0.69	0.41	0.72	0.81	0.46	0.66	0.71
28	pp	1.74	2.32	3.34	1.64	1.41	1.05	0.92	0.76	0.48	0.45	16.92	3.59	1.61	1.61	1.90	1.45	1.59	0.16	0.17	0.18	0.14	0.08
32	pp	1.69	0.36	0.87	1.18	4.47	0.47	0.45	0.02	0.03	0.01	0.00	0.00	0.95	0.81	0.61	0.47	0.63	0.02	0.01	0.00	0.00	0.00
33	pp	5.33	6.03	5.94	5.31	4.02	2.86	3.30	3.31	3.54	3.38	0.07	0.13	0.96	0.81	0.84	1.04	1.03	0.01	0.02	0.03	0.03	0.03
34	pp	52146	24826	20585	45714	255034	41.44	29.83	23.70	23.10	20.20	1.29	0.80	171.70	36.46	79.84	27.29	40.27	7.51	2.51	3.84	1.45	1.95
35	pp	-	-	-	-	0.16	-	-	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
68	pp	1.99	1.92	2.16	2.20	1.15	2.08	1.95	1.27	1.17	0.80	3.80	2.48	0.96	0.66	0.73	0.92	0.59	1.00	0.50	0.28	0.25	0.18
	allpp	6.03	5.99	5.99	4.79	4.22	3.05	3.15	2.66	2.49	2.50	0.53	0.61	0.98	0.81	0.84	1.04	1.00	0.18	0.13	0.16	0.13	0.11
00	pca	0.01	0.11	0.20	0.27	0.86	2.34	3.87	4.38	6.40	6.20	0.02	0.01	0.12	0.08	0.05	0.04	0.04	0.51	0.11	0.06	0.04	0.09
01	pca	2.24	2.29	4.09	3.16	1.64	0.06	0.13	0.13	0.15	0.19	0.11	0.04	0.24	0.26	0.29	0.25	0.24	113.75	111.94	110.90	89.06	81.32
02	pca	0.00	0.03	0.07	0.13	0.24	0.19	0.23	0.23	0.21	0.30	0.03	0.01	0.40	0.46	0.45	0.45	0.45	0.20	0.27	0.12	0.13	0.16
03	pca	47.05	169.22	151.75	152.73	177.26	1.32	1.50	1.60	1.50	1.73	17.52	10.15	0.87	0.99	1.03	1.05	1.21	3.47	4.59	2.97	2.86	3.06
04	pca	0.12	0.07	0.07	0.15	0.11	0.07	0.09	0.10	0.12	0.15	0.03	0.03	0.39	0.48	0.51	0.57	0.51	24.71	19.00	18.21	17.42	10.40
05	pca	2.76	4.66	2.98	3.75	4.32	0.43	0.52	0.56	0.63	0.72	19.91	10.32	0.39	0.39	0.37	0.38	0.37	75.91	73.00	49.27	34.19	23.74
06	pca	1.99	1.23	0.72	0.22	0.32	0.22	0.33	0.25	0.43	0.46	21.19	3.41	0.16	0.19	0.25	0.36	0.31	421.74	495.40	116.93	161.73	139.05
07	pca	89.04	65.69	126.43	106.96	52.61	5.94	9.29	8.26	6.01	6.57	34.60	8.97	1.36	1.45	1.70	1.59	1.27	8.18	4.55	4.82	5.81	3.64
08	pca	0.58	0.58	0.73	0.49	0.51	0.86	0.76	0.79	0.81	0.98	0.78	0.36	0.75	0.82	0.79	0.87	0.96	1.42	1.22	1.17	1.05	0.81
09	pca	0.34	0.41	0.27	0.54	0.75	0.71	0.85	1.13	1.04	0.88	2.19	1.25	0.77	0.82	1.13	1.63	1.23	1.35	1.42	1.86	2.13	2.49
11	pca	0.07	0.20	0.79	1.10	1.68	0.41	0.53	0.54	0.66	0.49	0.56	0.35	0.66	0.82	0.86	0.93	1.05	0.13	0.15	0.26	0.27	0.21
12	pca	3.20	2.57	2.32	4.11	2.76	0.04	0.05	0.23	0.04	0.17	0.40	0.34	0.63	0.54	0.71	0.91	1.00	1.15	2.46	1.43	1.13	1.14
21	pca	933.03	44.45	3.31	4.03	0.24	0.24	0.29	1.73	0.93	1.00	0.34	0.06	4.46	4.67	3.66	2.80	1.80	0.84	0.22	0.12	0.06	0.03
22	pca	0.02	0.08	0.02	0.03	0.03	0.23	0.07	0.09	0.16		4.00	2.05	0.56	0.67	0.55	0.50	0.52	9.95	9.45	1.04	3.35	1.67
23	pca	22.17	26.28	24.74	17.54	10.91	44.51	37.82	41.69	15.59	10.89	0.91	0.80	1.56	1.39	1.40	1.58	1.50	33.85	36.01	29.43	23.41	14.95
24	pca	510.39	3651.03	477.29	171.81	14.61	203.21	353.68	349.79	215.99	168.53	313.31	63.31	1.47	1.81	1.88	2.16	1.45	0.34	0.25	0.28	0.13	0.11
25	pca	0.00	0.02	0.02	0.12	0.30	0.15	0.09	0.16	0.10	0.12	0.32	0.32	2.26	2.32	1.81	2.21	1.54	0.18	0.09	0.10	0.15	0.01
26	pca	0.01	0.01	0.05	0.05	0.03	0.44	0.31	0.26	0.32	0.27	0.38	0.27	0.56	0.63	0.64	0.55	0.62	0.06	0.06	0.07	0.15	0.14
29	pca	10.09	13.76	8.12	3.35	2.56	0.21	0.53	0.60	0.55	0.42	2.66	1.94	1.08	1.35	1.38	1.26	1.23	3.71	2.68	2.39	2.14	2.07

TABLE 6. (Continued)

SITC 2 digit	Trade agg	Indonesia					Malaysia					Phillipines		Singapore					Thailand				
		1986	1987	1988	1989	1990	1986	1987	1988	1989	1990	1986	1988	1986	1987	1988	1989	1990	1986	1987	1988	1989	1990
41	pca	3.26	1.08	0.75	1.14	1.71	0.05	0.05	0.03	0.23	0.83	0.93	0.13	0.25	1.25	0.24	0.39	0.81	0.72	0.38	0.06	0.07	0.04
42	pca	24.99	2.89	2.90	3.07	28.16	62.21	18.74	19.33	21.79	23.14	36.91	29.96	2.12	1.27	1.35	1.09	0.90	2.78	4.43	0.71	0.39	0.60
43	pca	3.43	6.22	10.63	6.29	10.06	24.15	89.85	92.87	88.72	99.52	8.38	11.24	1.04	0.92	0.76	1.22	1.24	0.37	0.60	0.18	0.10	0.08
63	pca	589.49	746.78	878.91	302.48	208.96	29.66	55.33	37.10	37.33	19.83	137.35	59.46	2.38	1.97	1.98	1.88	1.31	27.76	37.18	13.79	11.06	5.98
64	pca	0.27	0.70	0.94	1.01	0.84	0.10	0.14	0.25	0.30	0.29	0.02	0.05	0.46	0.46	0.46	0.48	0.46	0.30	0.31	0.25	0.22	0.16
	allpca	3.40	3.62	3.89	3.32	3.29	3.24	3.79	3.55	3.14	2.84	2.13	1.60	0.93	0.93	0.95	0.96	0.87	4.29	3.72	3.20	2.98	2.34
66	mli	0.41	0.88	1.70	1.46	1.20	0.63	1.03	1.13	1.18	0.96	0.79	0.55	0.21	0.27	0.29	0.38	0.40	2.03	1.74	1.72	1.00	0.78
82	mli	0.97	4.42	8.60	14.71	9.02	1.56	2.40	3.46	4.44	4.10	78.14	82.32	0.83	1.24	1.46	1.58	1.20	19.18	27.79	24.34	20.09	21.22
83	mli	0.31	1.94	4.41	7.19	16.46	0.30	0.49	0.38	0.50	0.89	16.88	11.57	0.29	0.31	0.33	0.12	0.13	34.29	70.13	63.44	20.86	44.66
84	mli	209.50	133.42	127.42	108.92	108.26	10.58	14.69	17.32	17.38	17.91	113.53	65.58	1.97	2.04	2.14	2.14	1.80	141.27	199.45	193.33	152.54	102.01
85	mli	1.36	12.44	28.92	88.64	307.15	2.59	3.11	3.63	4.45	4.92	171.87	53.08	0.23	0.38	0.40	0.40	0.39	163.90	260.86	217.25	178.74	124.94
89	mli	0.88	0.89	1.79	1.51	1.32	0.52	0.74	0.88	1.19	1.56	3.25	2.83	0.82	0.89	0.83	0.80	0.77	2.75	3.17	2.78	2.91	2.37
	allmli	2.51	4.09	5.73	5.74	6.98	1.49	2.09	2.38	2.64	2.70	7.89	6.09	0.86	0.98	0.96	0.97	0.89	5.39	5.87	5.82	4.20	3.23
61	mmc	5.36	13.06	4.14	1.29	0.48	1.03	1.09	1.04	0.57	0.53	0.24	0.16	0.46	0.40	0.52	0.49	0.43	4.53	5.03	3.02	1.74	1.41
62	mmc	0.14	0.43	0.82	1.03	0.91	1.90	2.21	2.30	2.11	2.12	0.13	0.14	0.53	0.59	0.59	0.33	0.55	1.81	1.82	1.77	1.59	1.34
65	mmc	1.67	2.30	2.33	1.76	1.68	0.60	0.57	0.52	0.41	0.42	0.22	0.23	0.44	0.48	0.49	0.52	0.53	1.73	1.37	1.30	1.05	1.08
67	mmc	0.11	0.29	0.32	0.42	0.19	0.24	0.31	0.24	0.20	0.16	0.16	0.13	0.31	0.30	0.28	0.30	0.27	0.14	0.10	0.11	0.08	0.05
69	mmc	0.01	0.03	0.17	0.25	0.25	0.24	0.28	0.31	0.31	0.33	0.16	0.18	0.52	0.49	0.53	0.59	0.61	0.41	0.44	0.35	0.45	0.45
71	mmc	0.00	0.00	0.00	0.01	0.02	0.40	0.28	0.35	0.29	0.29	0.01	0.01	0.51	0.49	0.48	0.59	0.45	0.02	0.12	0.12	0.12	0.08
72	mmc	0.00	0.00	0.01	0.00	0.01	0.18	0.20	0.16	0.10	0.07	0.08	0.04	0.64	0.57	0.55	0.56	0.52	0.10	0.07	0.03	0.02	0.02
73	mmc	0.00	0.00	0.00	0.00	0.01	0.09	0.10	0.08	0.05	0.05	0.02	0.02	0.53	0.33	0.32	0.54	0.45	0.08	0.03	0.06	0.03	0.08
74	mmc	0.03	0.01	0.01	0.02	0.01	0.25	0.35	0.38	0.38	0.27	0.03	0.03	0.75	0.74	0.77	0.79	0.65	0.25	0.26	0.27	0.25	0.27
75	mmc	0.01	0.00	0.01	0.00	0.00	0.10	0.20	0.32	0.59	1.03	0.17	0.30	2.24	2.30	2.40	2.29	2.21	0.25	0.39	0.58	1.08	1.46
76	mmc	0.02	0.03	0.07	0.16	0.22	1.27	1.87	2.16	2.56	2.69	0.28	0.64	1.31	1.55	1.60	1.62	1.46	0.03	0.07	0.22	0.79	1.11
77	mmc	0.03	0.03	0.09	0.13	0.13	1.13	1.09	1.11	1.06	0.97	1.29	1.20	0.87	0.82	0.78	0.81	0.78	0.93	0.89	0.85	0.68	0.63
78	mmc	0.00	0.01	0.03	0.03	0.03	0.09	0.13	0.06	0.11	0.10	0.56	0.08	0.46	0.37	0.34	0.38	0.38	0.06	0.06	0.12	0.11	0.10

TABLE 6. (*Continued*)

SITC 2 digit	Trade agg	Indonesia					Malaysia					Phillipines		Singapore					Thailand				
		1986	1987	1988	1989	1990	1986	1987	1988	1989	1990	1986	1988	1986	1987	1988	1989	1990	1986	1987	1988	1989	1990
79	mmc	0.04	0.07	0.09	0.05	0.09	0.41	0.79	0.63	0.40	0.40	0.08	0.00	0.47	0.47	0.66	0.51	0.44	0.41	0.03	0.01	0.08	0.01
81	mmc	0.14	0.32	0.81	0.80	0.62	0.14	0.43	0.61	0.75	0.60	0.74	2.25	0.25	0.30	0.35	0.39	0.34	1.79	2.38	2.04	1.90	2.39
87	mmc	0.21	0.01	0.01	0.01	0.02	0.34	0.34	0.45	0.42	0.42	0.01	0.01	0.69	0.77	0.75	0.71	0.72	0.08	0.09	0.15	0.14	0.20
88	mmc	0.10	0.13	0.15	0.25	0.32	0.40	0.40	0.39	0.47	0.51	0.16	0.24	0.49	0.47	0.53	0.60	0.55	0.46	0.36	0.43	0.51	0.82
	allmmc	0.10	0.13	0.19	0.21	0.18	0.68	0.76	0.74	0.69	0.66	0.39	0.32	0.83	0.88	0.91	0.93	0.91	0.46	0.42	0.37	0.39	0.40
51	mhc	0.04	0.08	0.06	0.10	0.09	0.31	0.26	0.40	0.33	0.31	0.35	0.33	1.41	1.45	1.32	1.56	1.48	0.08	0.07	0.04	0.04	0.06
52	mhc	0.10	0.07	0.10	0.09	0.08	0.11	0.12	0.13	0.12	0.11	0.15	0.22	0.47	0.48	0.52	0.52	0.45	0.10	0.07	0.06	0.06	0.08
53	mhc	0.09	0.03	0.06	0.11	0.13	0.12	0.11	0.13	0.16	0.19	0.01	0.02	0.58	0.60	0.66	0.91	0.87	0.08	0.09	0.09	0.10	0.10
54	mhc	0.19	0.20	0.24	0.16	0.14	0.19	0.22	0.20	0.21	0.23	0.09	0.04	1.09	1.02	0.99	0.98	1.09	0.10	0.11	0.15	0.12	0.13
55	mhc	0.71	0.56	0.72	1.22	1.36	0.28	0.34	0.37	0.43	0.45	0.22	0.24	0.51	0.57	0.65	0.60	0.63	0.24	0.27	0.33	0.33	0.33
56	mhc	5.78	1.83	1.71	1.47	2.09	0.23	0.31	0.26	0.39	0.28	1.25	0.57	1.19	1.28	1.03	1.19	0.99	0.00	0.00	0.00	0.00	0.00
57	mhc	0.00	0.00	0.00	0.01	0.00	0.16	0.17	0.08	0.15	0.32	0.58	0.88	0.31	0.40	0.34	0.55	0.58	0.00	0.01	0.00	0.03	0.11
58	mhc	0.00	0.03	0.06	0.07	0.07	0.09	0.10	0.09	0.09	0.08	0.14	0.13	0.91	0.96	0.96	0.93	0.88	0.18	0.15	0.14	0.18	0.18
59	mhc	0.03	0.04	0.04	0.07	0.12	0.58	0.52	0.68	0.49	0.25	0.23	0.20	0.86	0.95	0.81	0.44	0.34	0.14	0.17	0.28	0.31	0.38
	allmhc	0.15	0.11	0.14	0.18	0.19	0.24	0.24	0.27	0.24	0.20	0.33	0.24	0.92	0.96	0.93	0.82	0.75	0.11	0.11	0.11	0.12	0.14

Source: Computed from the models.

WES index, all the ASEAN countries with the exception of Thailand possess comparative advantage in primary products. This contradicts the nx_{ij} measure which shows that only Malaysia and Indonesia possess comparative advantage in primary products. The EIR_{ij} indices from Table 6 support the nx_{ij} measure showing comparative advantage only for Indonesia and Malaysia.

Overall, the measurement of comparative advantage according to the net export to total trade ratio of Table 4 yield results that are more in agreement with the export-import ratio of Table 6 than with the WES ratio of Table 5. Thus, we can conclude that the criteria for determining comparative advantage based only on one index is less superior than taking into account two or more indices. Balassa (1965) suggests a more stringent criteria to determine comparative advantage: If both the WES_{ij} and EIR_{ij} ratios are greater than unity, only then can we conclude that country i has comparative advantage in commodity j.

We will proceed with the analysis of RCA using the more stringent criteria as suggested by Balassa (1965). All the ASEAN countries except Singapore have comparative advantage in the production of crops and animal products as a whole. The comparative advantage of Thailand declined over the period examined with the WES index falling from 3.19 to 2.15 and EIR index declining from 4.29 to 2.34. Indonesia's comparative advantage in crop and animal products remained relatively stable with an average WES index of about 2.0 (EIR = 3.5) while that of Malaysia's was around 2.2 (EIR = 5.5) and Phillipines about 2.5 (EIR = 1.87). Thailand, Malaysia and Indonesia are all higly compartively advantaged in the production of crude rubber (SITC 23) while Singapore is comparatively advantaged to a lesser extent.[4] Indonesia, Malaysia and the Phillipines are highly comparatively advantaged in the production of wood, lumber and cork (SITC 24) while Thailand is at a comparative disadvantage with indices continuously decreasing between 1986 and 1990. But in the trade of wood and cork manufactures (SITC 63), all the ASEAN countries are at a comparative advantage. Malaysia's strength in the palm oil sector (and that of Indonesia and Phillipines) is being reflected in the consistently high RCA indices of SITC 42 (fixed vegetable oils) and 43 (processed oils, fat). Within the crop and animal products group, Thailand is also comparatively advantaged in the trade of SITC 01, 03-06 and 09. Although Thailand's comparative advantage

in the crops and animal products category diminished over the period examined, it is still the foremost country in ASEAN with respect to being comparatively advantaged in the crops and animal products category.

We will now examine the comparative advantage of the ASEAN countries in manufactured goods. Again, comparative advantage will be based on both the WES and EIR indices being greater than unity. In the manufacture of labour intensive goods as a whole, only Thailand and Phillipines are comparatively advantaged throughout the period examined while Indonesia acquired comparative advantage in the manufacture of labour intensive commodities in 1990. Thailand has comparative advantage in all the items categorized as labour intensive manufactures which include non-metallic mineral manufctures (SITC 66), furniture (SITC 82), travel goods and handbags (SITC 83), clothing (SITC 8), footwear (SITC 85) and miscellaneous manufactures (SITC 89). Phillipines is also comparatively advantaged in the manufacture of all items in the the labour intensive manufactured goods category with the exception of non-metallic mineral manufactures (SITC 66). All the ASEAN countries are comparatively advantaged in the manufacture of clothing (SITC 84) with the EIR index being relatively higher for Indonesia followed by Thailand, Phillipines, Malaysia and Singapore. But according to the WES index, for the manufacture of clothing, Thailand's index is the highest followed by Phillipines, Indonesia, Malaysia and lastly Singapore. In 1989, Indonesia acquired comparative advantage in the manufacture of footwear (SITC 85) and in 1990 it acquired comparative advantage in the manufacture of furniture (SITC 82) although it was disadvantaged previously.

All the ASEAN countries are at a comparative disadvantage according to the EIR index where trade for the categories moderately and highly capital and skill intensive manufactures as a whole are concerned although the degree of disadvantage varies among them. But according to the WES index, Singapore is comparatively advantaged in the trade of the moderately capital and skill intensive manufacturers.

In some of the product divisions, for the moderately capital and skill intensive manufactures, the WES index is greater than unity indicating comparative advantage while the EIR index is less then unity. This apparent contradiction in the conclusions regarding RCA

based on the different indices can be resolved if the phenomena of intra-industry trade is examined. The EIR index takes into account imports while the WES index ignores imports in a specified commodity. In product divisions where intra-industry trade is predominant; for example in SITC 77 for Malaysia, the EIR index is clustered around unity while the WES index is clustered around three. Thus, the phenomena of intra-industry trade does condition the results of comparative advantage and Balassa's (1965) more stringent criteria of using both the EIR and WES index in assessing comparative advantage should be noted.

Singapore is least disadvantaged in the trade of the moderately capital and skill intensive manufactures followed by Malaysia, Thailand, Phillipines and Indonesia which are increasingly disadvantaged. The ranking of the ASEAN countries in terms of RCA indices where trade in highly capital and skill intensive manufacturers is concerned is different from that of the moderately capital and skill intensive manufactures with Singapore being least disadvantaged followed by Phillipines, Malaysia, Indonesia and Thailand.

When examining the highly capital and skill intensive products, Indonesia and Phillipines consistently possess comparative advantage in fertilizers (SITC 56). The ASEAN countries are comparatively disadvantaged in the trade of all the remaining items in the highly capital and skill intensive manufactures category.

Looking at the items in the moderately capital and skill intensive manufactures category, we see that Thailand has comparative advantage in the trade of leather and leather products (SITC 61). Malaysia and Thailand have EIR indices greater than unity in the manufacture of rubber products (SITC 62) with the former country being more advantaged. But the WES index is less than unity for both the countries which then implies tha Malaysia and Thailand are not comparativley advantaged in the manufacture of rubber products. Indonesia and Thailand have comparative advantage in the manufacture of textile yarn and fabrics (SITC 65) but the comparative advantage of the latter country is dwindling with comparative advantage being minimal in 1990. Singapore exhibits comparative advantage in the trade of SITC 75 (office machines and automative data processing equipment). Malaysia and Singapore are incresingly gaining comparative advantage in the production of telecommunication and sound recording equipment

(SITC 76) with Malaysia outpacing Singapore where EIR values are concerned. Thailand acquired comparative advantage in SITC 76 for the year 1990. Malaysia was comparatively advantaged in the manufacture of SITC 77 (electrical machinery and parts) between 1986 and 1989 but the EIR index for 1990 is less than unity (0.97) implying the onset of comparative disadvantage.

To summarize: in the moderately capital and skill intensive category, Thailand has comparative advantage in leather and leather manufactures; Indonesia and Thailand have comparative advantage in the manufacture of textile, yarn and fabrics; Singapore has comparative advantage in the manufacture of office machines and data processing equipment; while Malaysia and Singapore have comparative advantage in telecommunication and sound recording equipment with Thailand acquiring comparative advantage in 1990. Lastly, Malaysia and Phillipines have comparative advantage in electrical machineries and parts but the former country's comparative advantage eroded in 1990. All the ASEAN countries are at a comparative disadvantage in the trade of the remaining items in the moderately capital and skill intensive category.

THE CHANGING STRUCTURE OF REVEALED COMPARATIVE ADVANTAGE

In order to identify changes in the structure of comparative advantage of the ASEAN countries, the 1986 WES vector was correlated with the 1990 WES vector. The results of the correlation are shown in Table 7. The lowest correlation of 0.37 occurs for Indonesia in the category of manufactured labour intensive goods. This reinforces the above analysis of RCA which shows that Indonesia's comparative advantage in the manufacture of labour intensive goods increased substantially. In other words, the structure of comparative in 1986 for the labour intensive manufacture is significantly different from that of 1990.

The second lowest correlation of 0.561 is for Thailand, also in the manufacture of labour intensive manufactures. In this category. the WES indices for some of the items did not change much while in other items the change was significant especially in SITC 83 (travel goods, handbags) and SITC 85 (footwear).

TABLE 7. Correlation of the 1986 WES vector with the 1990 WES vector

Trade Aggregate	Indonesia	Malaysia	Phillipines	Singapore	Thailand
pp	0.995	0.998	0.996	0.998	0.692
pca	0.975	0.823	0.985	0.950	0.966
Non-manufactures	0.982	0.828	0.985	0.944	0.966
mli	0.370	0.940	0.978	0.926	0.561
mmc	0.967	0.822	0.980	0.912	0.703
mhc	0.987	0.684	0.973	0.816	0.816
Manufactures	0.669	0.828	0.837	0.909	0.843

Source: Computed from the models.

In the manufacture of highly capital and skill intensive goods, Malaysia's correlation of 0.684 indicates some structural change with respect to comparative advantage as shown by the WES index. Compared to all the other ASEAN countries, Malaysia's change is the greatest over the period examined.

Overall, Singapore's structure of manufactures production remained relatively the same while that of Indonesia's changed the most. As for Malaysia, Phillipines and Thailand, there were some changes in the structure of comparative advantage as shown by the correlation coefficient of 0.828, 0.837 and 0.843 respectively.

The structure of comparative advantage for the non-manufactures remained relatively stable compared to the manufactures for the ASEAN countries as a whole. Only Thailand had a relatively low correlation coefficient of 0.692 for the primary products group which reflects changing WES indices for the items in the category. Similarly, for Malaysia in the category crops and animal products, changing directions of the WES indices resulted in a correlation coefficient of 0.828. The remaining coefficients for the items in the non-manufactures category were either equal or greater than 0.95.

The changes in the export performance of the ASEAN countries were correlated with changes in world import growth for the different commodities. The results of the correlation are shown in Table 8. Positive and high correlation coefficients imply changes in export perfomance for commodities in which world demand is growing. But the results in Table 8 show that for more than half of the items the correlation coefficient was negative or not significantly different from zero. The highest correlation coefficient, 0.672, was

TABLE 8. Correlation of the changes in the WES Vector and World Import
Growth between 1986 and 1990

Trade Aggregate	Indonesia	Malaysia	Phillipines	Singapore	Thailand
pp	-0.550	-0.622	-0.272	-0.789	-0.398
pca	0.364	-0.097	0.201	0.240	0.029
Non-manufactures	0.030	-0.072	0.064	0.115	-0.069
mli	-0.631	0.291	0.120	-0.917	0.035
mmc	-0.242	-0.038	-0.047	-0.070	0.070
mhc	0.672	-0.324	0.490	-0.039	0.191
Manufactures	0.017	0.070	0.383	-0.107	0.228

Source: Computed from the models.

for Indonesia's export performance in the manufacture of higly
capital and skill intensive commodities followed by the Phillipines
correlation coefficient of 0.49 also for the manufacture of highly
capital and skill intensive commodities. For the group, manufac-
tures as a whole, the change in export performance of Phillipines
and Thailand seems to be "beneficial" in the sense that export
performance is improving for the commodities in which world
demand is increasing.

   The EIR and WES vectors were correlated to see if inherent
comparative advantage is being realized in the trade of the ASEAN
countries. The EIR and WES vectors were correlated for the years
1986 and 1990. If the correlation coefficient increased, it can be
concluded that inherent comparative advantage is being realized
and that net protection has decreased over the period examined for
the particular group of commodities. Table 9 shows the correlation
coefficient of the WES and EIR vectors for the ASEAN countries and
for the various trade aggregates.

   The negative values for Singapore in the primary products
group may be attributed to Singapore's entreport trade as explained
earlier. In the non-manufactures group, the correlation coefficient
did not change much for the ASEAN countries except for the
Phillipines where net protection has decreased between 1986 and
1988. For the category, crops and animal products, comparative
advantage is being realized for Indonesia and Phillipines (and to a
lesser extent for Thailand) since the correlation coefficients showed
some increase.

TABLE 9. Correlation of the WES and EIR vectors for the
year 1986 and 1990.

Trade Aggregate	Indonesia		Malaysia		Phillipines		Singapore		Thailand	
	1986	1990	1986	1990	1986	1988	1986	1990	1986	1990
pp	0.971	0.986	0.938	0.966	0.966	0.956	-0.253	-0.221	0.349	0.604
pca	0.346	0.735	0.624	0.663	0.240	0.504	0.116	0.382	0.257	0.334
Non-manu-factures	0.576	0.572	0.631	0.672	0.256	0.506	-0.070	-0.066	0.282	0.357
mli	0.989	0.891	0.958	0.887	0.326	0.815	0.902	0.867	0.563	0.803
mmc	0.543	0.915	0.509	0.739	0.852	0.531	0.817	0.956	0.805	0.678
mhc	0.985	0.977	0.846	0.638	0.942	0.640	0.463	0.014	0.929	0.895
Manufactures	0.495	0.720	0.292	0.342	0.309	0.762	0.669	0.697	0.630	0.790

Source: Computed from the models.

Indonesia, Malaysia and Singapore experienced increasing protectionism for the export of their labour intensive manufactures while Phillipines and Thailand experienced decreasing protectionism. This phenomena may be attributed to the Multi Fibers Agreement or the different degrees of access to foreign markets for different products by the ASEAN countries. In the manufacture of moderately capital and skill intensive goods, the reverse occurred. Indonesia, Malaysia and Singapore experienced decreasing protectionism as shown by the increase in the correlation coefficients of Table 9 while Thailand and Phillipines registered a decrease in the correlation coefficients implying an increase in net protectionsim.

In the case of highly capital and skill intensive manufactures, all the ASEAN countries exhibited increasing protectionism, but with varying degrees. The literature on protectionism does provide some evidence of increasing protectionist pressures for products in which the developed countries possess comparative advantage. The results here lend some support to this argument. Overall, for the group manufactures a whole, comparative advantage is being realized since the correlation coefficient registered increases over the period studied.

CONCLUSION

The ASEAN countries possess comparative advantage in different commodities with Malaysia and Indonesia being foremost in primary products which can be attributed mainly to petroleum production. In the case of crops and animal products, Thailand is comparatively advantaged although this advantage is declining. Malaysia, Indonesia and Phillipines are also comparatively advantaged but to a lesser extent than Thailand in the crops and animal products group. In the manufacture of labour intensive goods, Thailand is also at a comparative advantage with Indonesia acquiring comparative advantage in 1990. In the trade of moderately capital and skill intensive manufactures, only Singapore is comparatively advantaged. None of the ASEAN countries possess comparative advantage in the highly capital and skill intensive category.

The economy of Malaysia is heading towards industrialization. But the other ASEAN economies are also headed in the same direction. Malaysia may try to increase its competitiveness by increasing its efficiency, adopting suitable technology, expanding R & D efforts, increasing human capital, encouraging DFI in skill and technology intensive industries to facilitate technology transfer, and as well as expanding its infrastructural services and by seeking lucrative markets abroad. But these are also the very same strategies that other ASEAN countries are using. The structure of comparative advantage may be different among the ASEAN countries but the direction of change is definitely the same. In any commodity that Malaysia has comparative advantage we can find another ASEAN country that has a higher degree of comparative advantage or only lagging slightly behind. Thus, in order to remain competitive and acquire competitiveness in new sectors, the known strategies for success must be intensified and "new" strategies must be found to stay ahead.

APPENDIX

Composition of trade aggregates

Group	SITC Divisions	
Primary Products (P)	27 Crude Fertilizers 28 Metaliferous ores 32 Coal, coke, briquettes 33 Petroleum, related products	34 Gas, natural and manufactured 35 Electrical energy 68 Non-ferrous metals
Crops and Animals Products (PCA)	00 Live animals 01 Meat, preparations 02 Dairy products, eggs 03 Fish, preparations 04 Cereals, preparations 05 Fruit, vegetables 06 Sugar, honey 07 Coffee, tea, cocoa, spices 08 Animal feed stuffs 09 Misc. food preparations 11 Beverages 12 Tobacco, manufacturers	21 Hides, skins, furskins 22 Oils seeds, nuts, kernels 23 Crude rubber 24 Wood, lumber, cork 25 Pulp, waste paper 26 Textile fibers 29 Animal, veg. materials 41 Animal oils, fats 42 Fixed vegetable oils 43 Processed oils, fats 63 Wood, cork manufactures 64 Paper, paperboard
Manufactured Products Labour-Intensive (L1)	66 Non-metallic mineral manufactures 82 Furniture 83 Travel goods, handbags	84 Clothing 85 Footwear 89 Miscellaneous manufactured articles n.e.s.
Moderately Capital- and Skill Intensive (MCSI)	61 Leather and leather manufactures 62 Rubber manufactures, n.e.s. 65 Textile, yarn, fabrics 67 Iron and steel 69 Metal manufactures 71 Power generating machineries 72 Machinery specialized for particular industries 73 Metal working machineries 74 Gen. industrial machineries and parts 75 Office machines & automatic data processing equipment	76 Telecommunication & sound recording equipment 77 Electrical machineries and parts 78 Road Wheels 79 Other transport equipment (trains, aircraft, boats) 81 Sanitary fixtures 87 Professional scientific and controlling instruments and apparatus (n.e.s.) 88 Photographic apparatus, equipment and supplies and optical goods, n.e.s, watches and clocks.
Highly Capital- and Skill-Intensive (HCSI)	51 Organic chemicals 52 Inorganic chemicals 53 Dyeing, tanning, coloring 54 Medicinal, pharmaceutical products	55 Essential oils 56 Fertilizers 57 Explosives 58 Plastic materials 59 Chemical materials, n.e.s.

Source: Rana (1988).

NOTES

[1] SITC 9 was excluded from the analysis since postal packs (91), special transactions (93), animals n.e.s. (94), firearms, ammunition (95) and coins, non-gold (96) were viewed as items not suitable for economic analysis by the author.

[2] SITC 35 (electrical energy) was hardly traded by the ASEAN countries and thus deleted from analysis.

[3] The author suspects that Rana's (1988) classification of SITC 77 as moderately capital and skill intensive good suggests that Malaysia's manufactured exports are more capital and skill intensive relative to Thailand since about one-third of Malaysia's manufactured exports in 1990 is in SITC 77.

[4] Singapore does not produce its own rubber but imports from other ASEAN countries like Malaysia that may have been mixed with synthetic rubber and re-exported which led to Singapore's slight comparative advantage in SITC 23 which includes both natural and synthetic rubber.

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Jabatan Analisis Ekonomi &
Dasar Awam
Fakulti Ekonomi
Universiti Kebangsaan Malaysia
Bangi, Selangor