Chapter II

Can a Sub-Regional Group Enhance the Tie?

---with emphasis on East Asia---

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1. Introduction

The 1994 APEC Economic Leaders' Declaration in Bogor asked the Eminent Persons Group (EPG) to review the interrelationships between APEC and the existing sub-regional arrangements (SRTAs, such as AFTA, ANZCERTA, FTAA and NAFTA), to examine possible options for preventing obstacles between them and to promote consistency in their relations.[1] Twelve APEC members out of 18 already belonged to a SRTA, and the weight of the SRTA members, in terms of GDP, accounted for more than half of the APEC total. As the members proceed toward the Bogor liberalization targets for trade and investment, margins of preference between SRTA members and non-SRTA members should theoretically diminish. However, in the meantime, SRTA enhancement prior to completing APEC-wide liberalization might bring about a net trade diversion effect. In other words, non-members of a SRTA might be driven away from trading with SRTA members due to an enhanced SRTA. This is one of the main reasons for the Leaders Meeting's request to review the SRTAs.

EPG answered the Leaders Meeting's request by submitting the Third Report,

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[1] See APEC Leaders Meeting (1994).

"Implementing the APEC Vision 1995."[2] EPG stated in the report that further liberalization within the existing SRTAs, and any linkups between them, would be constructive and supportive of the overall APEC process only if they were pursued within the principles of "open sub-regionalism" , which is analogous to the concept of "open regionalism" in APEC as a whole (See **Table 1**).

     Thus, APEC officially recognized SRTA as long as it does not harm non-SRTA members. However, East Asian APEC members, namely Japan, Korea, Taiwan, China, and Hong Kong do not belong to any of the SRTAs. In this paper, the author would like to compare existing SRTAs to a hypothetical "East Asian group" consisting of the above-mentioned five members, and the author would like to measure the effect of enhanced intra-East Asia trade.

Table 1.   APEC Principle of Open Sub-Regionalism

1. Maximize unilateral liberalization.
2. Establish a firm commitment to reduce barriers to APEC economies that are nonmembers of the SRTA as well as those within the SRTA itself.
3. Develop an offer by each SRTA to extend the benefits of its SRTA liberalization to all other APEC members on a reciprocal basis.
4. Recognize that any individual SRTA member can unilaterally extend its SRTA liberalization on an unconditional basis to all other APEC economies (and, under the rules of the WTO, to all other members of the WTO as well), or on a conditional basis to one or several other APEC economies.

Source: EPG Third Report, 1995

     For the sake of simplicity, in this paper, five East Asian members hypothetically belong to the "East Asian group", which is analogous to other SRTAs in APEC. The author will collectively call the SRTAs and East Asian group "sub-regional groups". In the first section, the comparison begins by reviewing SRTAs in APEC and trade intensity within each of the regional groups. Trade intensity index is a tool which is somewhat descriptive, but it

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[2] See APEC Eminent Persons Group (1995)

visualizes how trade flows within a sub-regional group like SRTA tend to increase. In the second section, the analysis investigates trade flow determinants using the gravity model of international trade. In the estimation, the author puts special emphasis on sub-regional dummies. By adding dummies into the gravity model, the author tries to quantify the trade creation effect within a regional group or the trade diversion effect against non-group members due to the existence of a certain regional group. The third section will specifically discuss the East Asian group. The author will explain why intra-East Asia trade has not been as active as other SRTAs in APEC. Also assuming that, in the future, the East Asian group will have economic value toward itself, the author will measure the possible impact of the increased intra-regional trade, under a certain set of assumptions.   Lastly, the final section concludes.

2.   SRTAs in APEC and Trade Linkage

2-1.   SRTAs in APEC

As mentioned above, out of 18 APEC members, 12 members belong to at least one sub-regional trade agreement (SRTA).   The following summarizes SRTAs' economic presence in APEC and shows the profile of each individual SRTA in APEC.

Economic Presence of SRTAs in APEC

SRTAs in APEC represent a large portion of the APEC region as a whole. In 1996, the SRTAs accounted for 58.4% of GDP and 54.6% of the total trade in APEC (See **Table 2**). NAFTA, which includes the United States, occupies the greatest portion in APEC. Each SRTA similarly concentrates its trade with APEC. The APEC share in each SRTA's exports is about 70-80%. However, export concentration within its own area differs across the SRTAs. It ranges from 9.7% (ANZCERTA) to 47.5% (NAFTA) with an average of 39.5%. This reflects the fact that the total economic volume of each SRTA varies; the economic size of ANZCERTA is small, while NAFTA is economically large.

Among the APEC members not covered in SRTA, "East Asia" occupies the largest

fraction. East Asia, which includes Japan as the biggest economy, accounts for 38.0% of the

GDP and 40.7% of the exports in APEC. Similar to other SRTAs, East Asia is quite

involved in intra-APEC trade. East Asia's main export destination is APEC, which accounts

for 75.4% of its total exports. East Asia's trade concentration in its own area is 34.7%,

which is moderate compared with other SRTAs.

Table 2.   GDP and Exports in APEC---1996

	GDP			Exports		To		To	
		Share in APEC (%)	World Share (%)	Total	Share in APEC (%)	APEC	APEC share (%)	Own SRTA	Own share (%)
AFTA	694	4.2	2.3	333	13.7	257	77.1	80	24.1
ANZCER	457	2.7	1.5	75	3.1	56	74.2	7	9.7
NAFTA	8572	51.5	27.9	920	37.8	664	72.2	437	47.5
USA	7636	45.9	24.8	623	25.6	396	63.6	189	30.4
SRTA Total	9724	58.4	31.6	1328	54.6	977	73.6	524	39.5
East Asia	6327	38.0	20.6	989	40.7	746	75.4	343	34.7
Japan	4600	27.6	15.0	411	16.9	311	75.5	104	25.3
Other Members	78	0.5	0.3	18	0.7	11	59.0	0	0.0
New Members	525	3.2	1.7	97	4.0	25	25.4	0	0.2
APEC21	16653	100.0	54.2	2432	100.0	1758	72.3	1758	72.3
EU15	8456		27.5	1861		358	19.3	1047	56.3
World	30742		100.0	5300		2419	45.6	5300	100.0

Remarks: GDP and export figures are in billions of US dollars.
             "APEC21" in this table is expanded definition including new members entering in 1998
             (Peru, Russia and Vietnam).
             "Other Members" are Chile and Papua New Guinea.
             "New Members" are Peru, Russia and Vietnam.
Sources: GDP   IMF, "International Financial Statistics";
                       Hong Kong, "Hong Kong Monthly Digest of Statistics";
                       Directorate-General of Budget, Accounting and Statistics, Executive Yuan,
                       Republic of China, "National Income in Taiwan Area of the Republic of China".
             Exports   IMF, "Direction of Trade Statistics";
                       Department of Statistics, Ministry of Finance, Republic of China, "Monthly
                       Statistics of Exports and Imports";
                       Hong Kong, "Hong Kong Monthly Digest of Statistics".

The APEC members generally concentrated their trade more within APEC and their

own sub-region trade in 1996, compared with a year earlier. The ratio of intra-APEC trade

for AFTA, NAFTA, and ANZCERTA increased from 75.5%, 71.1% , and 75.5% in 1995

to 77.1%, 72.2%, and 72.2% in 1996, respectively.[3]

Profile of Each SRTA in APEC

Table 3 summarizes the profile of each SRTA in APEC.

AFTA was in 1992 formed by the six ASEAN members to further enhance economic cooperation in the region. ASEAN, launched in 1967, initially emphasized political and diplomatic aspects affected by the Vietnam War. But as economic volume grew, economic aspects also received attention. The advent of large scale economic integration in the 1990s such as NAFTA, further integration of EU (European Union), and a growing need for self-sufficiency of industrial intermediates within the region served as a background for the formation of AFTA, which embodied ASEAN's economic philosophy. AFTA's main scope of activity is tariff reduction. Specifically, starting in 1993, AFTA agreed to implement the Common Effective Preferential Tariff Scheme (CEPT) in which the members would cut the tariff rates of 15 items down to a 0-5% level within 15 years. Later on, the time range was decreased to 10 years, which means the tariff reduction goal was set to 2003. In 1995, Vietnam joined ASEAN as well as AFTA.

NAFTA came into effect in 1994, and consists of three North American members, the United States, Canada and Mexico.   NAFTA covers a wide range of trade- and investment-related liberalization. It not only includes tariff reduction in the field of traded goods, but it also includes deregulation in service sectors, abolition of non-tariff barriers, etc. Canada and Mexico benefited more from NAFTA than the United States. For Canada, NAFTA strengthened existing Canada's benefits from the US-Canada Free Trade Agreement. For Mexico, strengthened Mexico's relationship with the US brought about increased investment inflow, as well as increased exports. As for new membership in NAFTA, Chile may still join, but the pace of dialogue with the US government has recently slowed down.[4]

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[3] For intra-APEC or own region trade ratios in 1995, see Tables 7-8 of Okuda(1997). The ratio of intra-APEC trade as a whole decelerated in 1996, mainly because of new members' lower commitment to trade with APEC members. Specifically, Russia's trade linkage is stronger with European countries', and this probably cause the intra-APEC ratio to be somewhat diluted.

[4]On August 6, 1997, the US government decided to suspend negotiations with Chile concerning its full membership in NAFTA; partly because Chile already enhanced its ties with MERCOSUR countries.

Table 3.   Sub-regional Trade Agreements in APEC

Abbreviation	Official Name	Establishment	Participants from APEC
AFTA	ASEAN Free Trade Area	1992	Singapore, Malaysia, Thailand, Philippines, Indonesia, Brunei
ANZCERTA	Australia-New Zealand Closer Economic Relationship Treaty Agreement	1963	Australia, New Zealand
NAFTA	North American Free Trade Agreement	1994	United States, Canada, Mexico
FTAA*	Free Trade Area of the Americas	1994	United States, Canada, Mexico, Chile
(Non-SRTA)			Japan, Korea, Taiwan, China, Hong Kong, Papua New Guinea

*In the 1994 Summit of Americas held in Miami leaders from 34 countries in North and South America agreed to complete negotiations for the agreement by 2005.

ANZCERTA (often further abbreviated **CER**) formed in 1963. Since then, the two participants, Australia and New Zealand, had implemented trade and investment liberalization, and in 1990 they completely abolished tariff on all trade items and liberalized investment between them. This total liberalization of trade and investment made ANZCERTA the most harmonious sub-regional trade agreement in APEC.

FTAA is not yet an established free trade area[5]. However, all countries in North and South America, except Cuba, agreed that they would complete the negotiations for the agreement by 2005. In order to achieve that goal, 12 working groups are currently taking action, in such fields as market access, customs procedures and rules of origin, and investment. In this sense, FTAA is in fact an acting SRTA although no visible result has come of it yet.[6]

Lastly, six APEC members are not covered in any SRTAs. Those members are listed in the bottom row of **Table 3**. It is worth noting that, as mentioned, most of them are East

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Instead, the US seeks for a bilateral trade agreement set under a looser conditions than the more binding NAFTA. However, Chile's acceptance as another full NAFTA member is still possible. Once the bilateral agreement is met, the US aims to invite Chile to become a full member of NAFTA. For details, see http://www.threeweb.ad.jp/~oficomtk/htm/news/BN/19970829.htm

[5] In the rest of the analyses in this paper, the author does not treat FTAA as an object of analysis mainly because it is not yet a fully established SRTA and the members from APEC almost overlap with NAFTA.

[6] For a quick overview of FTAA, see http://www.ftaa-alca.org/EnglishVersion/view.htm.

Asian countries.[7]

2-2.   Trade Intensity of SRTAs in APEC

One may naturally anticipate that a sub-regional group may bring about a positive effect on trade. The trade intensity index is a useful tool for showing the strength of the trade linkage within a sub-region group. **Table 4** summarizes trade intensity of sub-regional groups in APEC in 1996. The trade intensity index Iij is defined as follows.

$\quad$ Iij = (Xij/Xi) / ((Mj/W), ----------(Equation 1)

where Xij is exports from country I to j, Xi is total exports from country I, Mj is total imports of country I, and W is world trade. The first parenthesis in **Equation 1** signifies country j's weight in country I's exports. The second parenthesis in the Equation denotes country j's share in world imports. If country I exports to country j intensively, then the trade intensity index goes up. This concept can be also extended to the relations between sub-regional groups.   An index above unity signifies a stronger trade tie between the two countries involved compared to the global standard, and vice versa.

As shown in the Table, trade intensity indexes with a group's own areas (diagonal shaded areas in the Table) tend to register higher values than trade intensity indexes with others. This suggests that countries prefer to trade within their own area, probably for the following two reasons. Firstly, countries in the same sub-region are geographically close to each other, and this results in smaller trading costs. Secondly, some of the sub-regional groups presented in the Table, as mentioned, correspond to existing sub-regional trade agreements in APEC. Trade agreements, more or less, bring about economic benefits to both exporting and importing countries through reduced tariffs, lower impediments, freedom in business, and so on.

Besides the diagonal cells, which signify trade within own areas, some off-diagonal

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[7] Malaysian Prime Minister Mahathir first advocated EAEG (East Asian Economic Group) in 1990. In his opinion, the six members of ASEAN plus Japan, Korea, and China formed the group, and non-Asian countries were excluded. In 1991 his plan was approved by ASEAN as EAEC (East Asian Economic Caucus), simply a forum for Asian countries. However, the United States intensely opposed the EAEC concept, and this made the potential members, except Malaysia, reluctant to proceed any further toward forming the EAEC. Until now, ASEAN has addressed early formation of EAEC, but the concept is almost

cells show trade intensity indexes above unity[8].   For example, higher off-diagonal values are found in ANZCERTA's exports to East Asia and AFTA (2.45 and 2.04---see Table 4), and AFTA's exports and imports with East Asia (1.84 and 1.96---See Table 4).   These higher values in the off-diagonal cells, supposedly, comes from complimentary trade structures for exporting and importing groups.   For example, South East Asian countries import a huge amount of Japanese intermediate inputs.   Another example is that Japan imports a bulk of primary material from Australia.   In other words, a better match of export and import needs is supposed to lead to an increased trade flow.

Table 4.   Trade Intensity in APEC---1996

Exporters	Importers								World Share (Exports, %)
	East Asia	AFTA	ANZCER	NAFTA	Other Members	New Members	APEC21	EU15	
East Asia	2.12	1.96	1.37	1.26	0.90	0.78	1.65	0.39	18.7
AFTA	1.84	3.72	1.62	0.98	0.46	0.85	1.69	0.41	6.3
ANZCER	2.45	2.04	7.33	0.45	4.70	0.43	1.62	0.32	1.4
NAFTA	1.04	0.76	1.20	2.42	1.63	0.47	1.58	0.43	17.4
Other Members	1.88	0.63	4.46	0.83	0.00	1.37	1.29	0.64	0.3
New Members	0.84	0.35	0.27	0.44	0.46	0.14	0.56	0.79	1.8
APEC21	1.63	1.67	1.50	1.60	1.21	0.64	1.58	0.42	45.9
EU15	0.39	0.41	0.65	0.43	0.52	0.49	0.42	1.66	35.1
World Share (Imports, %)	16.4	6.5	1.3	19.6	0.3	1.5	45.6	33.9	100.0

Remark: Trade intensity index $I_{ij} = (X_{ij}/X_i) / ((M_j/W)$,
            where X_{ij}: Exports from group I to j, X_i: Total exports from group I,
                        M_j: Total imports of group I,   W: World trade.
            Therefore, an index above unity signifies that the trade relation between the two groups involved is stronger than the world standard.   Shaded areas in the diagonal cells show trade intensity with own area.
Source: Calculated from Appendix Table.

"sleeping" in favor of APEC.
[8] In Table 4, the trade intensity index of "other members" with ANZCERTA with respect to both exports and imports recorded very high values of 4.46 and 4.70, respectively. This is due to the fact that

Does East Asia look like other SRTAs?

In terms of trade intensity indexes, yes, figures for East Asia look like other SRTAs, such as AFTA, NAFTA and ANZCERTA: East Asia has enhanced trade within its own region and with some of the other areas with better matches of trade structures. Indeed, the trade intensity index is a handy tool to measure the relative intensity of trade linkage between any two countries or groups. However, we should note that the trade intensity index is not able to distinguish between the effects of geographical closeness and that of regional groups, such as SRTA. The high trade intensity index for intra-East Asia trade may be due to the mutual closeness, or due to being a de facto regional group, or mixture of them. Moreover, the difference in the impact on trade between a formal trade agreement and a mere regional group cannot be measured either. To overcome this limit, the author performs an analysis of trade determinants in the next section using so-called "gravity model".

3.   Determinants of Trade Flows in APEC--clarifying the sub-regional
group effect

3-1. Methodology

In the first section, the trade intensity index shows that trade within a region tends to increase, but it did not isolate some important indicators necessary for the purpose of this paper, the effects of a formal SRTA and of a mere regional group, like "East Asia". These effects, among others, can be analyzed using "gravity model" of international trade. In a gravity model, the main variables for explaining a trade flow are GDP for both exporting and importing countries plus the distance between the two countries. This is comparable to Newton's principle of gravity in physics, with the weights of two objects and the distance between them as main actors. In a gravity model of international trade, determinants are not necessarily only the economic size and distance apart. Other explanatory variables include

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international trade of Papua New Guinea, one of the "other members", is highly concentrated to Australia.

common language, similarity of culture, political regime (whether capitalistic or socialistic), and affiliation to a certain economic entity. Affiliation to a certain SRTA or being a member of a geographically adjacent group, like East Asia, can also be measured for the purpose of the current analysis[9].

In the following, the author analyzes determinants of trade flows in APEC, with special emphasis on the effect of a SRTA or a regional group.

3-2.   Adopted Model

Following Hirata et al.(1985) and Okuda(1997), and considering that the main focus of the current analysis is to isolate SRTA's trade effect, the author specifies the gravity model in **Equation 2** shown below. For a quick explanation of the variables, see **Table 5**.

T_{ij} = f [CNST, GDPX, GDPM, DIST, CIJ,

     HK, SPORE,

     CHN, MEX,

     AFTA, NAFTA, ANZ, EA,

     XAFTA, XNAFTA, XANZ, XEA] ----------(Equation 2)

CNST, GDPX, GDPM, and DIST are traditional ingredients of a gravity model. CIJ is the trade complementarity index[10], which enters the equation to control the complementarity of

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[9] Still, the gravity model is not almighty. Price difference, as suggested in conventional trade theory, is not incorporated in the model. Also, the model is usually weak in explaining the cause of trade imbalances between two countries. Nevertheless, the author decided to adopt a gravity model to analyze the determinants of trade in APEC because of its good estimation performance, and abnormalities can be detected and explained by analyzing the discrepancy from the forecast series.

[10] The definition of trade complementarity index is as follows.

    Cij= h [(RCAxih)*(RCAmjh)*(Wh/W)], where

    Cij:complementarity index for Country i's exports and J's imports,

    RCAxih:Country i's revealed comparative advantage index of exports of commodity h

    RCAmjh: Country j's revealed comparative advantage index of imports of commodity h

    Wh/W: share of commodity h in world trade.

The definition of revealed comparative advantage is as follows.

    RCAxih (Xih/Xi) (Wh/W), where

    Xih:exports of commodity h from Country i to the rest of the world,

    Xi:Country i's total export.

RCAmih is also definied in a similar manner. For details about trade complementarity indexes and revealed comparative advantage indexes, see Okuda (1997).

trade structures between the two trading countries involved. HK and SPORE are the interport dummies used to check the effect of intermediary trade in Hong Kong and Singapore. This intermediary trade tends to boost their trade volume compared to their small economic sizes. CHN is the China dummy used to correct for China's tendency to trade less compared to its economic presence. The China dummy can be regarded as a "large country" dummy, but at the same time, it can be seen as a socialist regime dummy. Because its international trade, especially before the 1980s, was affected by socialistic control over the national economy. MEX is applied to Mexican exports, which show great downward discrepancies compared with the importers' data. This dummy enters the equation to correct this bias. After 1990, the figure released from the Mexican authority included exports from of maquiladoras, but it still shows some discrepancies[11].

Table 5.   Description of Explanatory Variables

Tij	Exports from Country i to j
CNST	Constant
GDPX	GDP of exporting country I
GDPM	GDP of importing country j
DIST	Distance between exporting and importing countries
CIJ	Complementarity index with respect to Country I's exports and j's imports
HK	Hong Kong interport dummy: 1 if the flow involves Hong Kong, 0 otherwise
SPORE	Singapore interport dummy: 1 if the flow involves Singapore, 0 otherwise
CHN	China dummy: 1 if the flow involves China, 0 otherwise
MEX	Mexican export dummy: 1 if Mexican exports. 0 otherwise
AFTA	Intra-AFTA dummy: 1 if the flow is intra-AFTA, 0 otherwise
NAFTA	Intra-NAFTA dummy: 1 if the flow is intra-NAFTA, 0 otherwise
ANZ	Intra-ANZCERTA dummy : 1 if the flow is between Australia and New Zealand, 0 otherwise
EA	Intra-East Asia dummy: 1 if the flow is between East Asia economies, 0 otherwise
XAFTA	AFTA vs off-AFTA dummy: 1 if the flow involves AFTA but not intra-AFTA, 0 otherwise
XNAFTA	NAFTA vs off-NAFTA dummy: 1 if the flow involves NAFTA but not intra-NAFTA, 0 otherwise
XANZ	ANZCERTA vs off-ANZCERTA dummy: 1 if the flow involves ANZCERTA but not intra-ANZCERTA, 0 otherwise
XEA	East Asia vs off-East Asia dummy: 1 if the flow involves East Asia but not intra-East Asia, 0 otherwise

AFTA, NAFTA, ANZ, and EA are intra-regional dummies used to measure the trade

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[11] For a more detailed explanation of all these explanatory variables, see Okuda (1997), which adopted a

creation effect[12] of SRTA for AFTA, NAFTA, and ANZCERTA, and the effect of belonging to a sub-regional group for East Asia. If a coefficient is measured positive, it means the intra-region trade is enhanced, even taking into account the geographical closeness, economic size of the trade partners concerned and match of trade structures. So, if EA measures significantly positive, then the concentration of trade within East Asia is beyond the geographical closeness of trade partners, and so on.

On the other hand, XAFTA, XNAFTA, XANZ, and XEA are defined as the trade between the above-mentioned sub-regional groups and non-member economies. Intra-regional trade flows are excluded. These variables are in the equation to measure the trade diversion effect[11], which appears in the trade flows between a participant to a certain sub-regional group and non-participants.

Data Compilation

(1)Sample years: The collected dataset covered the years 1970, 80, 90, 95 and 96. One equation per sample year was run, so that we can see the change in the estimated coefficient over time.

(2)Trade data: Nominal US dollar figures. The figures for the years up to 1990 were mainly retrieved from IDE's trade retrieval system (*AIDXT*), and figures after 1995 came mainly from IMF, *Direction of Trade Statistics* (DOT). Since IMF data does not explicitly cover Taiwan's trade data, Taiwan's trade data are taken from Department of Statistics, Ministry of Finance, Republic of China, *Monthly Statistics of Exports and Imports, Taiwan Area, the Republic of China*. The trade flows used here are generally export figures. If the exporting country did not report a figure, the information from the import partner replaced the data left blank.

(3)GDP figures: Nominal US dollar figures. Mainly based on IMF, *International Financial Statistics* (IFS). However, Taiwan's GDP figures came from Directorate General of Budget, Accounting and Statistics, Executive Yuan, Republic of China,

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similar specification.
[12] The terms "trade creation" and "trade diversion" effects used here are almost analogous to those used in the theory of custom union. For further details , see Lindert and Kindleberger (1982), pp177-189. Case studies on EU integration can be found in Toida (1995).

National Income in Taiwan Area of the Republic of China. Figures in terms of national currencies were converted using the average exchange rate for each corresponding year (series *rf* in IFS).

(4) Distance: Basically the marine distance between two representative ports in sea miles. A great portion of the dataset is from the distance data in Hirata et al. (1985).   Treatment for the adjacent economies generally followed Hirata, too.

(5) Trade Complementarity Index: Taken from Okuda (1997).   For the years 1995 and 1996, the complementarity indexes were replaced by the 1990 values, because the data for the corresponding years were not available.

3-3.   Estimation Results

Table 6 shows the estimated coefficients for the explanatory variables in **Equation 2**   The overall performance of the estimation was quite good for each of the equations, as seen from the reported R-squared values.

Table 6.   Summary Table for the Regression Results
Dependent Variable: ln Tij
Model: Equation 2

Explanatory Variables	Estimated Coefficients				
	1970	1980	1990	1995	1996
CNST	13.680 ***	10.282 ***	10.684 ***	7.686 ***	6.391 ***
ln GDPX	1.036 ***	0.924 ***	0.838 ***	0.837 ***	0.856 ***
ln GDPM	0.974 ***	0.941 ***	0.875 ***	0.844 ***	0.854 ***
ln DIST	-1.101 ***	-0.819 ***	-0.770 ***	-0.488 ***	-0.445 ***
CIJ	1.600 ***	0.931 ***	1.322 ***	0.549 ***	1.090 ***
HK	1.980 ***	0.873 ***	1.060 ***	1.179 ***	1.149 ***
SPORE	2.118 ***	1.918 ***	1.511 ***	1.274 ***	1.279 ***
CHN	-3.855 ***	-1.445 ***	-0.825 ***	-0.437 ***	-0.354 ***
MEX	-2.535 ***	-2.173 ***	-1.901 ***	-1.739 ***	-1.549 ***
AFTA	-0.550	0.530	0.251	0.894 *	1.155 ***
NAFTA	-1.990 *	-0.340	-0.497	0.855 *	0.847 **
ANZ	1.171	1.866 ***	1.435 ***	1.778 ***	2.388 ***
EA	-0.913	0.431	-0.187	0.186	0.283
XAFTA	-0.275	0.274	0.129	0.337 *	0.401 **
XNAFTA	-1.323 ***	-0.550 ***	-0.531 ***	-0.610 ***	-0.570 ***
XANZ	0.329	0.425 *	-0.026	-0.026	0.008
XEA	-0.112	0.568 ***	0.231	0.331 *	0.348 **
Adjusted R^2	0.654	0.840	0.903	0.847	0.863
Log likelihood	-445.42	-274.12	-210.94	-263.93	-243.38

| S.E. of regression	1.714	0.815	0.614	0.754	0.692

Notes: Refer to Table 5 for the description of the variables.

Number of asterisks denotes the degree of statistical significance of the corresponding coefficient as follows.

*   20% significant

**   10% significant

***   5% significant

GDPs, distance, interport dummies of HK and SPORE, and country dummies of CHN and MEX were estimated to be highly significant for each year. All these coefficients tended to decrease over time. An impressive case is the coefficient of distance. According to the estimation, resistance to international trade caused by distance weakened over time. This reflects the fact that, due to recent technological improvements, the costs of shipping relatively decreased because the product per unit weight steadily increased recently. The China dummy's downward trend continued in 1996. This shows China's further involvement in international trade in that year. The Mexican dummy also tended to shrink, especially after 1990, reflecting the inclusion of maquiladoras trade into the national total.

Intertemporal Change in Regional Group Coefficients

Contrary to the above-mentioned variables, the effects of sub-regional group variables (intra-regional dummies and region participants vs non-participants dummies) were estimated to increase over time. The intertemporal change in the coefficients for those variables are summarized in **Figure 1**.

**Figure 1. Trade Creation and Trade Diversion Effect Associat
with SRTA**
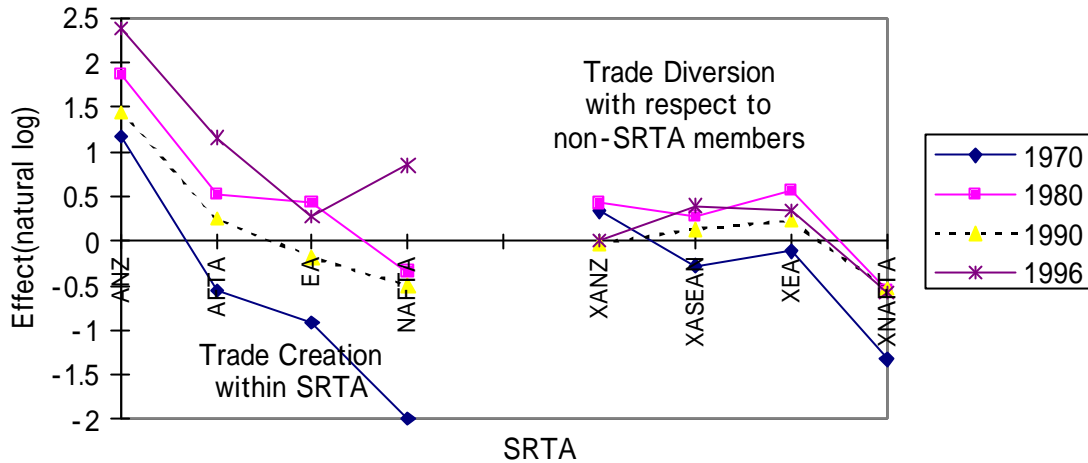
Source: Drawn from the results shown in Table 6.

The left hand side of **Figure 1** plots the intra-regional trade creation effect, and the right hand side plots the trade diversion effect of sub-regional groups with respect to non-group trade partners, which, if any, is measured by a negative coefficient for the corresponding variables.

As for the trade creation effect, it is clearly seen that the effect increased over time almost consistently. In 1970, the trade creation effect was only found in ANZCERTA, where a formal trade agreement had already launched; although the statistical significance of the effect was in doubt. By 1996, the trade creation effect drastically grew, and as a result, it turned positive in every sub-regional group. This, in other words, shows deepening interdependence in every sub-regional group, but the pace of improvement differs among the groups. For the formal SRTAs, that is, AFTA, NAFTA, and ANZCERTA, the estimated coefficient grew in magnitude as well as in statistical significance, as shown in **Table 6**. This upward tendency possibly coincided with the enhancement of trade agreements in each of the SRTAs. However, the effect in East Asia, where no formal regional trade agreement was formed, was still weak in magnitude and in significance.

On the other hand, the impact of regional groups on non-group members did not change greatly over time. The empirical results show that a persistent trade diversion effect

existed in NAFTA, but the magnitude stayed almost the same after 1980. The fact that NAFTA's trade diversion effect on non-members stayed the same even after its launch tells us that NAFTA's launch did not result in no major negative shock for non-NAFTA economies. For AFTA and East Asia, no negative coefficients were estimated for the samples after 1980, which means that those sub-regional groups spread the net trade creation effect to off-region economies. Moreover, the statistical significance of the net trade creation effect was fortified over the years leading up to 1996, as shown in **Table 6**. All these results seem to suggest that enhancement of the SRTAs in APEC did not bring about adverse effects toward non-SRTA members.

Behavior of SRTAs comformed to the principle of open sub-regionalism

In sum, it is suggested that enhancing the SRTAs in APEC possibly resulted in increased intra-regional trade, as expected, and without major adverse effects against outside regions. This is an important empirical result because the behavior of SRTA was verified to almost fully conform to the APEC principle of open sub-regionalism.

4.   East Asian Regional Group

As shown above, interdependence in the East Asian group deepened over time but not as much as in the formally established SRTAs. On the other hand, it was also shown that East Asia actively trades with non-region areas. But why has the intra-regional trade not been promoted much? And why has trade with off-regional areas proceeded actively?

4-1.   Factors Limiting the Intra-East Asian Trade

In 1996, East Asia occupied 38.0% of GDP, and 40.7% of exports in APEC. Intra-regional exports totaled 343 billion US dollars (See **Table 7**), accounting for 34.7% of the total exports from the region. However, considering its potential to further increase intra-regional trade, the estimation results shown above suggest that the intra-regional trade in the region is more or less constrained because the estimation results on regional groups were calculated net of the effects of closeness, economic size of the trade participants, and match of trade

structures.   The following are possible constraints to increasing intra-regional trade in East Asia.

Table 7.   Trade Flows in East Asia---1996   (Million US dollars)

Exporters	Importers Japan	China	Korea	Taiwan	Hong Kong	TOTAL
Japan		21827	29369	27493	25364	104053
China	30888		7527	3060	32904	74379
Korea	16002	11486		4162	11191	42841
Taiwan	13659	623	2662		26788	43732
Hong Kong	11829	61980	2935	1705		78449
TOTAL	72378	95916	42493	36420	96247	343454

Sources: IMF, "Direction of Trade Statistics";
            Department of Statistics, Ministry of Finance, Republic of China, "Monthly
            Statistics of Exports and Imports";
            Hong Kong, "Hong Kong Monthly Digest of Statistics".

(1) Absence of a formal trade agreement :   The above estimation results directly contrast with the intra-regional trade creation effect between the formal SRTAs and the informal group of East Asia.   The following factors have greatly caused the lack of a formal trade agreement in the region.

(2) Critical diplomatic climate in the region: In the East Asian region, Taiwan has been rather isolated because of its confrontation with Mainland China.   This is the main reason why East Asian economies cannot form a formal trade agreement like others in APEC. Because of their political confrontation, it has been implausible for other East Asian economies to pursue a bilateral trade agreement with Taiwan, for fear that it would upset the Mainland.   Even after discontinuing formal relations with Taiwan, Japan and Korea maintained trade with Taiwan, but it is not based on any official agreement or protection pact.

Table 8.   Discrepancies from the Projected Values (Actual - Projected)

                                                                        (Million US dollars)

Exporters	Importers Japan	China	Korea	Taiwan	Hong Kong	TOTAL
Japan	0	-17153	5469	9383	-2052	-4352

China	-6948	0	1940	172	**22404	17569	(-4835)
Korea	-2037	4234	0	1052	-18322	-15073
Taiwan	1485	-3259	-254	0	17773	15745
Hong Kong	-9768	**56996	-7324	-2378	0	37525	(-19471)
TOTAL	-17267	40818	-169	8229	19804	51415

<div align="center">(-16178)   (-2600)   (-27985)</div>

Remark: Figures are calculated as (Actual value-Projected value). A negative figure
means an actual trade flow fell short of the corresponding projected figure. A
positive figure means an actual trade flow exceeded the corresponding
projected figure. Figures in ( ) denote discrepancy excluding those of Hong
Kong- China trade, marked with '**'.

(1) Taiwan's concerns with the Mainland: Taiwan is gradually becoming more
concerned with the Mainland's economic presence.   Taiwan's direct and indirect
imports from Mainland China recorded $4.75 billion in 1996, about 4.7% of its total
imports[13]. Estimation of exports to the Mainland varies depending on what percentage
of exports to Hong Kong are re-exported to the Mainland.   At a maximum, the
Mainland's share in Taiwan's total exports was 24% in 1996 under an extreme
assumption[14].   Under this situation, Taiwan's government started a series of policy
packages in 1994 called "Southward policy" (   )[15] to divert trade and
investment from the Mainland to Southeast Asian economies as a precaution against
possible Mainland influence caused by excessive dependence .

(3) Peculiarity of Hong Kong-China trade: Even taking into account the closeness of
these two economies and of Hong Kong's special function as an interport, the model tends
to underestimate the Hong Kong- China trade flows.   It is widely known that China
utilizes Hong Kong as a trade gate to and from the world.   If this peculiarity is considered,
estimated values of the intra-regional trade within the region will be higher, and that would
turn the region-wide discrepancies of the intra-regional trade negative, as seen in **Table 8**.

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[13] This figure is a rough estimate, the sum of direct imports of $3.06 billion plus imports from Hong Kong,
which the author assumes to be indirect imports from the Mainland, amounting to $1.70 billion.

[14] Hong Kong is supposed to play a more important role in re-exporting Taiwan's exports to Mainland.
Taiwan's direct exports in 1996 were only 0.62 billion US dollars. In contrast, the exports to Hong Kong
recorded 26.89 billion dollars. If we regard that the exports to Hong Kong are totally re-exported to the
Mainland, the total amount reaches 27.51 billion dollars, which occupies 23.7% of the Taiwan's total
exports.

[15] See Peng (1995) pp. 27-30.

The Table shows that the actual intra-regional trade in the region exceeded the estimated value by about 51 billion US dollars (15.0%). However, it is also shown in the Table that positive residuals involving China-Hong Kong trade amounted to about 79 billion US dollars (23.1% of the total regional trade).   Netting the China-Hong Kong trade[16] discrepancies leaves a   negative total residual of 28 billion US dollars (-8.1%) for the whole region. This means that the actual intra-regional trade in East Asia falls short of the estimated value.

(4)Existence of two big economies: Usually big economies, in a geographical sense or in terms of economic scale, tend to depend less on trade than small economies because the large economies are more or less self-sufficient, and they have a more complete set of industries. East Asia includes Japan, which possesses a self-sufficent industrial structure, and China, which has a vast territory and tiny, but compact, sets of industries scattered among its provinces. The downward bias of Japan-China trade compared to projected trade can be understood in this context.   Korea-Hong Kong trade is also biased downward, but considering that Hong Kong has served as a gateway for China, China's vastness may adversely affect trade in this case.

4-2.   Simulation---Under Improved "East Asian" Effect

If we assume the constraints mentioned above are given, we will have no other choice but to decide that improving the East Asian region's trade environment will be difficult to accomplish. However, the author foresees that such a constrained situation will be somewhat mitigated in the future, under the following grounds.

(1)   Despite the Taiwan government's alert against the Mainland in economic aspects, the private sector's involvement in Mainland business has already developed fairly deeply. Based on this, China-Taiwan trade will grow in the long run.

(2)   The Chinese economy will integrate further into the world trade market, especially the coastal area. Along China's coast, other East Asian economies like Japan, Korea, and

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[16] This treatment is consistent with Hong Kong's return to China in July 1997. Starting then, China-Hong Kong trade became a part of the Chinese domestic transactions.

Taiwan will serve as supply bases for the Chinese demand for materials and intermediate inputs.

(3) Under the ongoing re-structuring of the Japanese and Korean economies, their "one-set doctrine" (want to have all industries) will gradually, but inevitably, fade out. This may lead to a division of labor between the two economies. This may furthermore enhance a division of labor between the two economies and Taiwan which has a similar industrial structure. Enhancing the division of labor in these three economies will, hopefully, facilitate an increase in intra-regional trade flows.

(4) Note that the above mentioned factors will also positively affect the region's trade with outside economies.

Considering all these, the author would like to perform a simulation analysis under the following assumptions.

The Environment for intra-East Asia trade will improve because of the above mentioned factors.

However, political confrontation between China and Taiwan will be difficult to resolve, and it is expected to persist in some form.

So, improvement in the intra-regional dummy will be moderate.

The value of the East Asian dummy will rise, say, to half the level of the AFTA dummy (1.155, exponential---see Table 6).

Assume here that improvement appears rather extensively in the trade flows with downward biases compared with the estimation values for 1996.

In such cases, apply the improved EA dummy variable of 0.577 (half of AFTA dummy, exponential). Specifically, the effect of increased EA dummy is measured based on the actual trade values of 1996. This is equivalent to a 34.2% improvement for the existing trade flows for the corresponding cases.

The simulation result is shown in **Table 9**. The sum of discrepancies between the

actual values and the new projected values is 94.1 billion US dollars. Compared with the corresponding figure in Table 8 (51.4 billion US dollars), the simulated figure increased by 42.7 billion US dollars, about 12.5% of the total regional trade.

Table 9.   Discrepancy from the Projected Value   (Actual - Simulated projection)

(Million US Dollars)

Exporters	Importers Japan	China	Korea	Taiwan	Hong Kong	TOTAL	
Japan	0	-9686	5469	9383	6625	11791	
China	3619	0	1940	172	**22404	28135	(5731)
Korea	3437	4234	0	1052	-14493	-5770	
Taiwan	1485	-3046	656	0	17773	16869	
Hong Kong	-5722	**56996	-6320	-1795	0	43159	(-13837)
TOTAL	2819	48498	1745	8812	32309	94184	
		(-8498)			(9905)	(14784)	

Remark: Figures are calculated as (Actual value - New projected value). New projected values are calculated from Equation 2, using an improved EA dummy based on the assumptions explained in the text. The same interpretation for the figures as in the Remark of Table 8 applies. Figures in ( ) denote discrepancy excluding those of Hong Kong-China trade, marked '**'

As a result of the simulation, the increment of exports exceeds that of imports for some economies, and vice versa. **Table 10** summarizes the net balance of the changes in the intra-East Asia trade by economy. Under this assumption, in terms of trade balance, United China and Japan almost equally lose mainly in favor of Korea and to a lesser extent Taiwan. Korea is also supposed to benefit most in terms of economic growth. Its improved trade balance within the region will raise Korea's GDP by 1.52 percent. Japan's concession will lower its economic growth rate , but by a very slight margin of 0.09 percent of GDP. China's concession is relatively large compared with Japan, but still minimal, considering its recent high growth performance reaching 10% per annum.

Table 10.   Gains from Improved EA Dummy

(Million US dollars)

	Imports	Exports	Balance	GDP	Bal/GDP(%)
Japan	20087	16143	-3944	4599706	-0.09
China	7680	10566	2886	815412	0.35

Korea	1915	9302	7388	484777	1.52
Taiwan	583	1124	540	273060	0.20
Hong Kong	12505	5634	-6871	154171	-4.46
China+HK	20185	16200	-3985	969583	-0.41

5. Conclusion

Under a set of conditions summarized in "Principles of Open Sub-Regionalism," APEC officially recognized sub-regional trade agreements (SRTAs) within itself in 1995. Out of 18 APEC members, 12 members belong to at least one SRTA. SRTA members in APEC now represent a large portion of GDP, nearly 60% of the APEC total. However, non-SRTA members, mostly East Asian economies, also represent about 40% of the total economic size in APEC.

The author tried to compare the formal SRTAs in APEC with an informal regional group in East Asia. Through an analysis of trade intensity indexes, they looked similar to each other, with high intensity indexes for intra-regional trade. However, since the trade intensity indexes could not distinguish between the effects of geographical closeness and a group-specific factor (such as belonging to a certain trade agreement or being a member of sub-regional group), the gravity model of international trade was introduced.

As a result of regression, the trade creation effect of intra-SRTA trades and of intra-East Asia trade increased over time, but a weaker effect was observed for East Asia. As for the sub-regional groups' trade with non-participants, a persistent trade diversion effect was detected for NAFTA, but the level itself stayed almost the same after 1980. The effect calculated for AFTA, ANZCERTA, and East Asia was generally positive, which means that they did not radiate a trade diversion effect, but instead a trade creation effect against non-members. So the enhancement of sub-regional trade agreements in APEC proceeded quite well, in light of the "Principle of Open Sub-Regionalism".

Through a brief analysis of East Asian economies, it was shown that the intra-East Asian trade was not as productive as shown in the regression analysis. The constraints included the lack of a formal trade agreement, a critical diplomatic climate surrounding China

and Taiwan, the peculiarity of China-Hong Kong trade, and high self-sufficiency in Japan and China. However, the environment for intra-East Asian trade will probably improve. Under this optimistic prospect, the author performed a simulation analysis on an improved East Asian dummy. Assuming that the East Asian dummy increased to half the level of the current AFTA dummy, the intra-regional trade was forecast to grow by 42.8 billion dollars, or 12.5% of the total intra-East Asian trade. Korea was forecast to be the main beneficiary under the author's assumption, with an additional economic growth rate of 1.52%. This would be a significant allowance for Korea, which is supposed to experience great pains of negative economic growth in 1998 due to the fulfillment of the IMF policy agreement.

Appendix Table   Trade Matrix in APEC in 1996   (Million US dollars)

Exporters	Importers East Asia	AFTA	ANZCER	NAFTA	Other Members	New Members	APEC21	EU15	World
East Asia	343454	125363	17935	244637	3062	11312	745763	131819	989329
AFTA	100605	80182	7158	64183	522	4159	256809	45795	333244
ANZCER	30079	9884	7270	6591	1205	477	55506	8073	74843
NAFTA	156294	45205	14629	436805	5126	6324	664383	134358	919796
Other Members	5549	731	1067	2929	0	364	10639	3907	18033
New Members	13326	2199	352	8329	151	194	24551	25907	96844
APEC21	649307	263564	48411	763474	10066	22829	1757651	349859	2432089
EU15	117809	49777	16145	158165	3292	13298	358486	1046768	1860867
World	868960	343040	70250	1040770	18150	77910	2419080	1798000	5300200

Remark: Based on the figures reported by exporters. Some cells are traced back
                  from importers' data.
Sources: IDE, AIDXT Trade Data Retrieval System
                  IMF, Direction of Trade Statistics
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