



Working Paper 02-13

# An Examination of the Formation of Natural Trading Blocs in East Asia

Chang-Soo Lee and Soon-Chan Park

**KOREA INSTITUTE FOR  
INTERNATIONAL ECONOMIC POLICY**

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## Executive Summary

This paper seeks to identify the appropriate form of a regional trading agreement in East Asia by examining empirically the intra-regional trade bias of various informal regional groups. The findings are as follows. First, it is difficult to verify empirically that the three Northeast Asian countries, China, Japan and Korea, are forming a regional trading bloc. Second China and ASEAN have no special relation in trade. Third, ASEAN+3 is emerging as a strong candidate for a natural trading bloc in East Asia. Fourth, there is little evidence that ASEAN+3 is centred around Japan, while the influence of the U.S. on the intra-regional trade in ASEAN+3 is positive and strong. Fifth, ASEAN+3 is characterized by openness to trade with the rest of the world. Finally, these results strongly suggest that ASEAN+3 would be the natural policy choice for the formation of regional trading agreements in East Asia. At the same time, ASEAN+3 will not diverge from the principles of open regionalism and multilateralism, when we consider its inherently open character and the positive influence of the U.S.

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# An Examination of the Formation of Natural Trading Blocs in East Asia

Chang-Soo Lee and Soon-Chan Park\*

## I. Introduction

With the second wave of regionalism sweeping the world, East Asian countries have come to acknowledge the need for some kind of regional economic cooperation. Recently, Japan and Singapore have arrived at a bilateral FTA, and various forms of regional cooperation are being proposed, such as ASEAN+3 (ASEAN plus Korea, Japan and China), ASEAN+China, China-Japan-Korea FTA and so on.

Which regional integration agreement is the most natural choice for East Asian countries? We start from the presumption that the institutionalization of a natural trading region, rather than the intentional creation of preferential arrangements, would further promote and accelerate trade between members by exploiting the existing economic, socio-cultural and other ties among them. Growth and efficiency in such regions is likely to be more greatly enhanced if they are supported by regional trade agreements.

Following Viner's (1950) contribution, a number of studies at-

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tempted to establish conditions under which customs unions would be more or less likely to bring about gains. In particular, Wonnacott and Lutz (1989) introduced the concept of “natural trading partners”, asserting that a regional integration agreement between such partners is likely to be welfare-enhancing. Two points were emphasized as criteria for “natural trading partners”: the trade relations and geographical proximity of the prospective members. If the prospective members are already major trading partners and they are close geographically, then the trading bloc will reinforce natural trade patterns. This concept of “natural trading partner” was popularized as “natural trading blocs” by Krugman (1991b), who puts more emphasis on the importance of geographical proximity. Transaction cost analysis also emphasizes geographical proximity as an important criterion for natural trade regions, but does not neglect other influences, such as a common cultural tradition, which contribute to lowering transaction costs (Amelung, 1990).

In this paper, we do not intend to clarify the various criteria for natural trade regions, but rather to focus on the empirical identification of such regions. How can natural trading blocs be empirically identified? Starting from the assumption that members of a natural trade region trade more with each other than the normal level determined by general factors affecting trade flows, we employ the gravity model to investigate the regional concentration in trade. Frankel (1997) provides the approach of capturing the intra-regional trade bias of a hypothesized trading region by adding dummy variables to the basic gravity model. When the coefficient for a hypothesized trading region shows a positive and statistically significant intra-regional trade bias indicating that two countries in this regional

group trade more with one another than predicted by their incomes and distance, then it is concluded that they form a natural trading bloc.

Methodologically, we extend the usual gravity equation by introducing explicitly import tariffs. Most empirical applications of the gravity equation make efforts to capture factors promoting bilateral trade, but surprisingly neglect the policy barriers impeding bilateral trade such as tariffs. Those studies consider only bilateral distance representing trade costs, but we show that adding import tariffs increases the explanatory power of the regressions. It turns out that tariffs have a great negative impact on trade and the coefficients are highly significant statistically.

We test various combinations of regional groups as possible natural trading blocs, including the various pairings of China, Japan and Korea, China-Japan-Korea, ASEAN, ASEAN plus China, Japan, or Korea and ASEAN+3 as a whole. We find no evidence that a regional bloc among the Northeast Asian countries is naturally forming. Although ASEAN has a statistically significant intra-regional trade bias, the ASEAN effect disappears completely when simultaneously tested with ASEAN+3. In contrast, ASEAN+3 remains highly significant in all tested cases, suggesting that ASEAN+3 would be a natural choice for a regional trading agreement.

We explore further the characteristics of ASEAN+3, focusing on three questions. The first one is whether ASEAN+3 is centered around Japan. Little evidence is found that Japan serves as the center of intra-regional trade, but the influence of the U.S. on the intra-regional trade bias in ASEAN+3 is positive and strong, even though it is weakening over time. More importantly, we examine

whether there is any possibility of the informal trading bloc of ASEAN+3 diverting trade with non-members. The empirical results show that ASEAN+3 is open to trade with the rest of the world, indicating that the creation of ASEAN+3 as a formal trading bloc can be characterized as an example of non-discriminatory market-driven integration.

The structure of the paper is as follows. Section II constructs a basic analytical framework to capture the bloc effect on trade, discussing how the gravity model can be applied to capture the intra-regional trade bias in an informal potential trading bloc. Section III empirically verifies which regional blocs are naturally forming. Section IV identifies the characteristics of the ASEAN+3 and explores whether it has special ties with the U.S. and Japan and assesses its openness. Section V discusses regionalization in East Asia and Section VI presents the main conclusions of this paper.

## II. Empirical Framework and Data

### 1. Regional Trade Bias

Simple statistics that can be used to assess the degree of regionalization are intra-regional trade share and the intra-regional concentration (intensity) ratio. Appendix I shows these statistics for Korea-Japan-China, and ASEAN+3 as well as for existing trading blocs such as AFTA and MERCOSUR. However, there are a number of reasons why these two measures are inaccurate in comparison with a measure based on the gravity equation.

There has been a long debate on the major reasons for regional trade concentration. Krugman (1991) and Summers (1991) point out that regional concentration in trade is attributed to geographical proximity, while Bhagwati (1992) and Panagariya (1995: 9-10) emphasize the “artificial” factor of preferential trade policies as the dominant explanation for the high concentration ratios. Frankel, Stein and Wei (1997) use the terminology of “super-natural” bloc in describing the real world between the two extremes of “natural” and “artificial” cases. In this paper, we do not intend to clarify the major factors for regional trade concentration, but focus on empirically identifying the existence of a regional trade bias within informal trading blocs<sup>1)</sup> or within a hypothesized regional group, reflecting unidentified informal factors such as international production networks and socio-cultural linkages.

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1) Frankel (1997) uses the term “informal trading bloc” as a contrasting concept to the existing idea of a “formal trading bloc.”

## 2. Analytical Framework

The natural empirical framework for detecting and quantifying the intra-regional trade bias is the gravity model, which establishes a “norm” of bilateral trade volume based on economic and geographic factors. The gravity model is appreciated as a standard framework for studying international trade patterns because of its empirical robustness (Eichengreen and Irwin, 1995). It has also been used to infer the trade effects of customs unions, national borders, and currency unions. By adding the dummy variable of a hypothesized regional trading bloc, Frankel (1997) extended the gravity model to estimate the concentration in trade within this region. The gravity model can thus capture not only the influences of geographical proximity and economic size on trade, but also trade effects of formal trading blocs and informal relations. If the estimated coefficient of a trading bloc is positive and significant, then there is a special regional effect that promotes intra-regional trade. The intra-regional bias of a hypothesized regional trading bloc does not result from preferential trade arrangements, but from other factors that link the prospective members to each other. They might reflect unidentified informal factors such as international production networks and socio-cultural familiarity. Following the approach of Frankel (1997), we examine empirically whether informal trading blocs are forming in East Asia.

The theoretical gravity models, provided by Anderson (1979), Deardorff (1998) and many others, define trade costs as all trade barriers impeding bilateral trade. However, most empirical works surprisingly neglect national policy barriers, which take various forms such as tariffs, regulations, quotas and so on. In those studies, geo-

graphical distance represents all trade costs. Distance is surely an important part of trade costs, but it is not the only determinant. Though tariff rates are considerably reduced through the rounds of multi-lateral negotiations, tariffs still remain as one of the main trade barriers. So we add explicitly national tariffs to the empirical gravity equation. Then, our basic specification is as follows:

$$(2.1) \log(T_{ij}) = \alpha + \beta_1 \log GDP_i + \beta_2 \log GDP_j + \beta_3 (TARIFF_j) \\ + \beta_4 \log (DISTANCE_{ij}) + \beta_5 (ADJACENT_{ij}) + \beta_6 (LANGUAGE_j) \\ + \gamma_k \sum_k BLOC_k$$

where  $\log GDP_i$  and  $\log GDP_j$  are the logs of the importing and exporting countries' GDPs respectively, while  $TARIFF_j$  indicates the average import tariff in country  $j$ , and  $\log(DISTANCE)$  is a log of distance. The various formal and informal trading blocs are represented by  $BLOC_k$ .

In Frankel (1997) and Bayoumi and Eichengreen (1995) and many others, the bilateral volume of total trade (in logarithmic form) is used as a dependent variable. In this case, it is assumed that the income coefficients are the same for the importing country and the exporting country. However, Linnemann (1966) found that the estimated income elasticities were different for the two countries. If so, it is not legitimate to aggregate imports and exports. In this paper, we treat imports and exports separately, so that the GDPs of the importing and exporting countries are entered in the regressions separately.<sup>2)</sup> Moreover, we extend the usual gravity equation by add-

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2) The similar applications can be found in Sologá and Winters (1999) and Frankel (1997: 141).

ing import tariffs which surely impede trade flows, but are neglected in most empirical studies. Import tariffs are easily introduced in the gravity equation, when imports and exports are treated separately. The aggregation of imports and exports requires constraints that force the coefficient on tariffs to be equal for imports and exports. In that case, the product of tariff rates of importing and exporting countries are entered in the regression. Following the tradition of the gravity model, bilateral distance, represent transportation costs, is measured by the log of physical distance between the two capital cities of the respective countries. In addition, we introduce a dummy variable  $ADJACENT_{ij}$  to indicate when the two countries share a common land border. We also include  $LANGUAGE_j$  in the gravity model to capture the effects of a common language on bilateral trade.<sup>3)</sup>

Once the norm has been established by the gravity model, a dummy variable can then be added to represent when both countries in a given pair belong to the same regional trading bloc (formal or informal). The dummy variable  $BLOC_k$  is defined as 1 for a given pair when both countries are members of the bloc, and zero otherwise. The coefficient on this bloc variable tells us the extent to which trade within the group has been promoted by explicitly preferential trading policies or by less formal socio-political forces (Frankel and Wei, 1996) that might stem from historical, political, cultural or other ties.

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3) We allow for countries in which more than one language is spoken and consider English, Chinese, German, French, Japanese, Spanish and Portuguese. A common language can facilitate trade partly because it directly reduces transaction costs and partly because it enhances exporters' and importers' understanding of each other's culture and legal systems, which indirectly promotes trade.

The statistical significance of the positive coefficient for the bloc dummy can be interpreted to mean that a trading bloc is naturally forming, if there are no formal regional integration agreements.

If basic variables, such as GDP, distance (including adjacent variable) and tariff variables, fully explain the bilateral trade in East Asia, geographical proximity would be the main reason for regional trade concentration in East Asia. In this case the level and trend in intra-regional trade would be due solely to the proximity of the countries, and to their rapid rate of overall economic growth.

### 3. Data

Our data set covers 52 countries for 1990, 1995 and 1999 (see Appendix Table A.1). The source for bilateral trade flow is the International Monetary Fund's *Direction of Trade Statistics*. We use GDPs based on the PPP, which are obtained from the World Bank's Global Development Network Growth Database. We faced some difficulties in obtaining bilateral tariff rates. Prewo (1978) provides annual bilateral tariff rates for 18 OECD countries for the years 1958 through 1974 and Deardorff and Stern (1990) also provide measures for pre- and post-Tokyo Round average tariff rates for 18 OECD countries. However, we could not obtain bilateral tariff rates for other countries. Instead of calculating bilateral tariff rates, we use the means of national tariff rates provided by the World Bank<sup>4</sup>) as proxies for bilateral tariffs.

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4) We obtain tariff rates from the World Bank's 2000 *World Development Indicators* and the web site [http://www1.worldbank.org/wbiiep/trade/TR\\_Data.html](http://www1.worldbank.org/wbiiep/trade/TR_Data.html). In the case of missing values, we use the average of the previous 3 years.

### III. Are Trading Blocs Forming in East Asia?

#### 1. Do Korea, Japan and China Constitute a Regional Trading Bloc?

Even if the major Northeast Asian countries, China, Japan and Korea, have many problems to solve before they can achieve formal regional economic integration, they have become interested in the idea of forming free trade agreements (FTA). To test whether an informal regional trading bloc is forming in Northeast Asia (China, Japan and Korea), we estimate the gravity equation for the years 1990, 1995 and 1999, including a Northeast Asian bloc dummy as well as contemporary regional trading blocs, such as the EU, NAFTA, MERCOSUR and AFTA (ASEAN).

The estimation results are summarized in Table 3.1. The two countries' GDPs are highly significant statistically and are also generally less than 1, indicating that trade increases with a country's GDP, but less than proportionally. The coefficient for distance implies that each percentage point increase in distance reduces trade by about 0.8 percent. The coefficient on the dummy variable for language also shows high statistical significance, but the coefficient for a common border is not significant statistically in the regressions. The introduction of import tariffs as the new independent variable leads to a great increase in the explanatory power of the regressions.<sup>5)</sup>

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5) When we estimate the gravity equation without the tariff rate of the importing country, then the adjusted  $R^2$  is 0.615 for the year 1990. We do not report these results separately.

Furthermore, the coefficient for tariffs is highly significant in all regressions. The absolute values of the coefficients also show the increasing trends over time, implying that trade flows are becoming sensitive to trade barriers.

**Table 3.1. Gravity Estimation: China-Japan-Korea**

	1990	1995	1999
Intercept	-16.755** (-19.178)	-21.972** (-25.457)	-23.110** (-25.172)
Log (GDP <sub>i</sub> )	.794** (37.693)	.888** (41.620)	.882** (41.342)
Log (GDP <sub>j</sub> )	.867** (41.582)	.946** (48.364)	1.000** (45.696)
Log (Distance)	-.853** (-20.566)	-.772** (-18.437)	-.818** (-18.974)
Tariff	-2.787** (-16.210)	-5.561** (-19.248)	-5.926** (-16.076)
Language	.630** (7.771)	.756** (9.903)	.803** (10.170)
Adjacency	.041 (.216)	.183 (1.030)	.0304 (.169)
C-J-K (N.East Asia)	-.199 (-.320)	.432 (.813)	.0375 (.070)
EU	.432** (2.760)	.389** (2.964)	.498** (3.695)
NAFTA	.292 (.509)	.065 (.120)	.533 (.977)
AFTA (ASEAN)	.713* (2.217)	1.273** (4.229)	.652* (2.109)
MERCOSUR	-.187 (-.319)	-.627 (-1.141)	-.336 (-.603)
Adj R <sup>2</sup>	.661	.715	.709
No. Observation	2174	2197	2173

Notes: 1) Figures in parentheses are t-statistics.

2) \*\*, \*, and + denote significance at the 99%, 95%, and 90% levels, respectively

Next, we turn to the bloc effect. The coefficient for the EU shows a statistically significant level of 0.43 in 1990 and rises to about 0.5 in 1999. The coefficients for NAFTA and MERCOSUR are not statistically significant for all tested years. The regional dummy of AFTA exhibits a strong inward trade bias during 1990-1999. However, the Northeast Asian dummy does not show statistical significance for any year. Thus we find no evidence that a trading bloc is forming among the three Northeast Asian countries.

Similarly, we also test whether there is any tendency toward a special trade bias in the three possible combinations of regional groupings in the Northeast Asia region Korea-Japan, Korea-China, and Japan-Korea. Table 3.2 summarizes the results. None of the regional trading bloc dummies shows statistical significance for any year, corroborating the assertion that there is no regional trade bias among China, Japan and Korea. In other words, the trade relations between them can be simply explained with the gravity variables.

## **2. Does ASEAN+3 Constitute a Regional Trading Bloc?**

In response to rising regionalism, the institutionalization process toward formal economic integration began first in East Asia. In 2001, the East Asian Vision Group (EAVG) submitted a report to the leaders of ASEAN+3, describing its vision of an "East Asian Community" and recommending the formation of an East Asia Free Trade Area well ahead of the Bogor goals set by APEC. Furthermore, at the Brunei ASEAN+3 Summit Meeting in 2001, Chinese and ASEAN leaders agreed to form a China-ASEAN FTA within ten years.

This section investigates the existence of a regional trade bias

Table 3.2. Gravity Estimation: Korea-Japan, Korea-China and Japan-China

	1990	1995	1999
<b>Korea-Japan</b>	.		
EU	.441** (2.820)	.385** (2.933)	.500** (3.722)
NAFTA	.298 (.519)	6.098E-02 (.113)	.534 (.980)
MERCOSUR	-.186 (-.318)	-.627 (-1.141)	-.335 (-.602)
AFTA	.718* (2.232)	1.270** (4.217)	.654* (2.115)
Korea-Japan	.708 (.727)	.529 (.582)	.33 (.35)
<b>Korea-China</b>			
EU	.356* (2.226)	.381** (2.906)	.495** (3.648)
NAFTA	.296 (.524)	5.811E-02 (.108)	.531 (.973)
MERCOSUR	-.251 (-.441)	-.628 (-1.143)	-.336 (-.604)
AFTA	.672* (2.091)	1.268** (4.210)	.650* (2.103)
Korea-China	- 2.451+ (- 1.787)	.16 (.18)	- .241 (- .261)
<b>China-Japan</b>			
EU	.366* (2.287)	.383** (2.923)	.497** (3.704)
NAFTA	.305 (.539)	6.048E-02 (.113)	.532 (.976)
MERCOSUR	-.241 (-.424)	-.628 (-1.144)	-.336 (-.603)
AFTA	.680* (2.114)	1.269** (4.215)	.652* (2.108)
China-Japan	- 2.3E-02 (- .023)	. 573 (. 631)	. 00 (. 03)

Notes: 1) Figures in parentheses are t-statistics.

2) \*\*, \*, and + denote significance at the 99%, 95%, and 90% levels, respectively

within the boundary of ASEAN+3. First, we add a new bloc dummy on ASEAN+3 for the years 1990, 1995, and 1999 and test whether a regional trading bloc is forming from the perspective of the ASEAN+3 framework. Second, we examine whether there is any tendency to promote regional trade between ASEAN as a whole and each of the three Northeast Asian countries, such as Korea+ASEAN, China+ASEAN and Japan+ASEAN, respectively.

Table 3.3 (first column of every year) shows the corresponding results for the first case. Introducing the ASEAN+3 bloc dummy makes the Northeast Asia dummy significant at the level of 90 percent for the years 1990 and 1999. But it turns out to be clearly negative, implying that Korea, Japan, and China trade less than one would expect given their GDPs and other gravity variables. Note that this does not mean that an FTA between them will not be beneficial. In contrast, one can expect that at least the normal level of trade would hold if these countries concluded an FTA.<sup>6)</sup>

ASEAN+3 has a significant and apparent intra-regional trade bias in every year tested. The coefficient of ASEAN+3 increased from 1.14 in 1990 to 1.37 in 1995, but fell to 0.89 in 1999. The decrease of the coefficient in 1999 might result from the financial crisis in East Asia. When we test for an AFTA bloc effect with an ASEAN+3 effect, the former disappears completely. This result is in line with Frankel and Wei (1996), who arrived at the conclusion that all of the increase in intra-Asian trade can be explained by the rapid growth of these economies, not out of any special ASEAN effect. This result is quite

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6) The gravity model can also be used to predict the natural pattern of trade that would hold if regional trade agreements were intentionally created. See Hamilton and Winters (1992) and Wang and Winters (1992).

Table 3.3. Gravity Estimation: C-J-K, AFTA and ASEAN+3

	1990		1995		1999	
EU	.481** (3.080)	.494** (3.165)	.454** (3.469)	.463** (3.545)	.561** (4.167)	.581** (4.334)
NAFTA	.330 (.578)	.341 (.596)	.120 (.224)	.125 (.234)	.588 (1.083)	.605 (1.114)
MERCO-SU R	-.182 (-.312)	-.172 (-.295)	-.618 (-1.134)	-.621 (-1.140)	-.321 (-.579)	-.302 (-.545)
C-J-K	-1.261+ (-1.907)		-.829 -1.455		-1.011+ (-1.743)	
AFTA	-.392 (-.972)		-0.05 (-.134)		-.447 (-1.163)	
ASEAN+3	1.137** (4.491)	.890** (4.616)	1.375** (5.812)	1.273** (7.088)	1.147** (4.763)	.893** (4.854)

Notes: 1) Figures in parentheses are t-statistics.

2) \*\*, \*, and + denote significance at the 99%, 95%, and 90% levels, respectively.

convincing when considering the fact that the three countries (Korea, Japan and China) accounted for about 70 percent of the total trade of ASEAN+3 countries and about 92 percent of the combined GDP of ASEAN+3 countries in 2000. AFTA might be meaningless without trade with their major trading partners in Northeast Asia. The conclusion seems to be that ASEAN is not in fact functioning as a trading bloc.

We estimate the gravity equation again without the two insignificant bloc dummies, Northeast Asia and AFTA, to measure the strength of the ASEAN+3 bloc. The results are reported in the second column in Table 3.3. The coefficient on the dummy ASEAN+3 is 0.890 for 1990, 1.273 for 1995, and 0.893 for 1999. The estimated coefficient is 0.89, implying that two countries of this bloc trade about 140 percent more with each other, after holding constant for GDP, distance, tariffs, and the other gravity variables, than two otherwise

similar countries. [ $\exp(0.89) = 2.43$ ]. This suggests that although ASEAN+3 countries have no formal trade agreement, there are unidentified factors that promote bilateral trade in this region.

Table 3.4 summarizes the testing results of the possible combinations between ASEAN and one of the three Northeast Asian countries. The trade relations of ASEAN with Japan and Korea, respectively, are very similar. Bloc dummies for Korea+ASEAN and Japan+ASEAN show significant and apparent intra-regional trade biases in every year tested (first column of every year), but the effects of the two dummies disappear when the ASEAN+3 dummy is included in the gravity equation with strong statistical significance (second column of every year). A remarkable point is that the coefficient for Korea+ASEAN shows an increasing trend, while the trade relation between Japan and ASEAN, although still strong, noticeably weakens after 1995.

The coefficients of China+ASEAN show inconsistent statistical results. The China+ASEAN dummy is significant only for the year 1995 and insignificant for the years 1990 and 1999, implying that the Chinese network, in contrast to common belief, is not yet in place. Moreover, the coefficient of China+ASEAN disappears completely and becomes negative when the ASEAN+3 dummy is included in the equation.

### 3. Widening ASEAN+3

Beginning with the three Northeast Asian countries, we studied various regional groups under the boundary of ASEAN+3. Now we consider a sequence of nested candidates for trading blocs in the Asia

Table 3.4. Gravity Estimation: Korea+ASEAN, Japan+ASEAN, and China+ASEAN

	1990		1995		1999	
Korea+ ASEAN						
EU	.462** (2.964)	.496** (3.171)	.415** (3.178)	.467** (3.573)	.548** (4.100)	.588** (4.379)
NAFTA	.314 (.548)	.342 (.598)	8.228E-02 (.154)	.128 (.241)	.572 (1.053)	.609 (1.123)
MERCO-SUR	-166 (-283)	-163 (-279)	-610 (-1.116)	-605 (-1.111)	-293 (-.528)	-285 (-.514)
Korea+ ASEAN	.996** (3.840)	.275 (.732)	1.428** (5.883)	.415 (1.202)	1.053** (4.231)	.396 (1.121)
ASEAN+3		.742** (2.656)		1.053** (4.104)		.685** (2.621)
Japan+ ASEAN						
EU	.472** (3.028)	.498** (3.186)	.421** (3.233)	.469** (3.588)	.546** (4.086)	.588** (4.376)
NAFTA	.330 (.577)	.348 (.608)	9.995E-02 (.187)	.135 (.253)	.579 (1.065)	.612 (1.127)
MERCO-SUR	-158 (-271)	-155 (-265)	-603 (-1.104)	-598 (-1.098)	-295 (.532)	-286 (-.517)
Japan+ ASEAN	1.126** (4.348)	.551 (1.476)	1.524** (6.286)	.616+ (1.792)	1.032** (4.146)	.358 (1.017)
ASEAN+3		.594* (2.136)		.948** (3.710)		.706** (2.712)
China+ ASEAN						
EU	.425** (2.722)	.495** (3.169)	.362** (-2.767)	.465** (3.565)	.475** (3.552)	.572** (4.271)
NAFTA	.285 (.496)	.335 (.587)	4.089E-02 (.076)	.124 (.232)	.513 (.940)	.591 (1.090)
MERCO-SUR	-207 (-354)	-204 (-350)	-662 (-1.205)	-640 (-1.174)	-367 (.510)	-343 (-.620)
China+ ASEAN	.413 (1.585)	-.813* (-2.255)	.882** (3.608)	-.558+ (-1.677)	.328 (1.317)	-.918** (-2.716)
ASEAN+3		1.310** (4.888)		1.557** (6.312)		1.358** (5.408)

Notes: 1) Figures in parentheses are t-statistics.

2) \*\*, \*, and + denote significance at the 99%, 95%, and 90% levels, respectively.

Pacific. What happens when we widen the bloc and test for the existence of informal regional blocs such as Asia Pacific and APEC.

Frankel and Wei (1996) test the bloc effect of "Asia Pacific," which includes all the countries with eastern coasts on the Pacific, including Australia and New Zealand. The results show that the coefficient and significance level of this bloc are both higher than the East Asia dummy. Then they broaden the bloc-search and test for the formation of an informal regional trading bloc called APEC, which includes the United States and Canada in with the others. The results are as follows: the coefficient of the APEC bloc dummy was highly significant, while the Asia Pacific dummy completely disappeared and the East Asia dummy remained significant. This implies that APEC would be the next alternative trading bloc for East Asian countries and that ASEAN+3 would continue to function as a regional trading bloc even with the existence of a wider APEC bloc.

One might argue that the bigger the regional group, the higher the intra-regional bias among them. However, there is significant evidence that this is not the case. Frankel (1997: 90) tests a potential TAFTA bloc (Trans-Atlantic Free Trade Agreement) defined as including all 15 EU members plus all three members of NAFTA and shows that the coefficient is always negative.

## IV. The Characteristics of ASEAN+3

In the previous section, it is shown that ASEAN+3 is emerging as a regional trading bloc in East Asia. To explore the characteristics of ASEAN+3, we focus on the two relevant questions in this section. Does every ASEAN+3 country have special trade relations with Japan and the U.S., respectively? Is ASEAN+3 open to trade with all countries or does it divert trade with the rest of world?

### 1. Are there Special Trade Relations with Japan and the U.S.?

The East Asian economies are generally outward-oriented. In particular, the U.S. and Japan as major trading partners are of vital importance for the growth of East Asia. It is often asked if a trading bloc is forming in East Asia, centered around Japan. There have been suggestions that Japan operates, through such channels as foreign direct investment, foreign aid, and other forms of finance, to influence Asian countries' trade toward itself (Dornbusch, 1989; Arase, 1991). On regionalization centered on Japan, Frankel (1992), using a separate dummy variable for bilateral Asian trade with Japan in particular, found that there is little evidence that Japan is transforming itself into a metropole in the regional pattern of trade. In contrast, Choudhry et al. (2000), also using a simple gravity model of trade flows within East Asian countries including Hong Kong and Taiwan, concluded that East Asian intra-regional trade centered around Japan goes beyond what can be explained by the gravity variables. We examine this issue again based on the bilateral trade flows of 52 countries in

the 1990s. In addition, though many believe that East Asian economies are highly interdependent with the U.S., there are surprisingly no empirical studies that explore the relations between the U.S. and East Asia.

To test the existence of the special trade relations of ASEAN+3 with Japan and the U.S., we add a separate dummy variable for the bilateral trade of countries in ASEAN+3 with Japan and the U.S., respectively. The results reported in Table 4.1 show that the Japan dummy was significant at the 10 percent level for the year 1990, but switched to be insignificant for the years 1995 and 1999. Hence, it is very difficult to argue that ASEAN+3 is centered around Japan. However, the absence of a special Japan effect does not mean that Japan plays no role in ASEAN+3. It is remarkable that the coefficient of the ASEAN+3 dummy remains still positive and significant after inclusion of the Japan dummy. This implies that although Japan has no special trade relations with other countries in ASEAN+3, it has an important position as an unexcludable member of ASEAN+3.

In contrast, the coefficient for the U.S. dummy is significant in every tested year. Furthermore, the coefficient of the ASEAN+3 dummy increases in every case when compared with the estimation results in Table 3.3. The increase of the intra-regional trade in ASEAN+3 might arise from the old principle that East Asian economies are highly dependent on the U.S. for their export markets. It is well-known that East Asian countries develop a low-cost production network in the region to achieve competitiveness in the world market and export a large amount of products to other regions. In this process, Japan provides countries in the region with capital and intermediate goods, increasing regional trade. However, potential regional growth in trade

**Table 4.1. The Relation of ASEAN+3 with Japan and the U.S.**

	1990		1995		1999	
E U	.501** (3.220)	.497** (3.182)	.460** (3.541)	.464** (3.557)	.578** (4.326)	.579** (4.317)
NAFTA	.394 (.692)	.343 (.600)	.176 (.331)	.127 (.238)	.655 (1.210)	.604 (1.112)
MERCO-SUR	-.174 (-.300)	-.190 (-.325)	-.618 (-1.141)	-.629 (-1.155)	-.299 (-.541)	-.315 (-.568)
ASEAN+3	.906** (4.723)	.686** (3.095)	1.292** (7.226)	1.152** (5.600)	.912** (4.974)	.752** (3.575)
US-Dummy	1.672** (4.723)		1.532** (4.721)		1.380** (4.168)	
Japan-Dummy		.787+ (1.849)		.480 (1.217)		.555 (1.384)

Notes: 1) Figures in parentheses are t-statistics.

2) \*\*, \*, + denote significance at the 99%, 95%, and 90% levels, respectively.

in East Asia critically depends on growth in final demand for East Asian products in other regions, particularly in North America. Considering this characteristic of the East Asian countries, the significant and positive economic ties with the U.S. in the bloc is not remarkable at all. At the same time, the insignificance of the Japan dummy might reflect the fact that Japan has constructed a production network in the ASEAN+3 framework but there has been less than full demand within the region for a large part of those final goods.

## 2. Openness of ASEAN+3

In this section, we investigate whether there is economically important trade discrimination in ASEAN+3. To capture the extra-bloc

effects of ASEAN+3, we introduce the openness dummy variable, which takes the value one for the case of imports by members from all countries. The coefficient of the openness dummy tells us how much members of a group trade with other countries in general, regardless of whether they are in the same group or not. If this variable is negative, it indicates that members of the group in question trade less with the rest of world than would be predicted, so a regional trade agreement (RTA) among them might divert trade.

**Table 4.2. Bloc Openness of ASEAN+3**

	1990	1995	1999
ASEAN+3	.774**	.881**	.958**
ASEAN+3-Openness	.245*	.379**	.045
EU	.418**	.451**	.567**
EU-Openness	.329**	-.087	.143+
NAFTA	.496	.247	.414
NAFTA-Openness	-.021	-.234+	.339+
MERCOSUR	.686	-.172	-.162
MERCOSUR-Openness	-.831**	-.571**	-.054
Adj. $R^2$	.674	.726	.712

Notes: 1) Figures in parentheses are t-statistics.

2) \*\*, \*, and + denote significance at the 99%, 95%, and 90% levels, respectively.

The results are summarized in Table 4.2. The introduction of dummy variables for the openness of the blocs reduces the estimated effect of ASEAN+3 a little, but the coefficients remain highly significant statistically. The magnitude of the coefficients for ASEAN+3 and the EU are increasing over time. The bloc openness of ASEAN+3 shows significant positive values for every case except in the year 1999. The

insignificance of the openness dummy in 1999 might reflect the financial crisis in Asia, which led to the recession of Asian countries. Note that the coefficient of ASEAN+3 for the year 1999 increases from 0.893 (Table 3.3) to 0.958, when the openness dummy is added. These results imply that the financial crisis led to the increase in intra-regional trade in East Asia. In contrast, the openness dummy for NAFTA is not significant in many cases and negative in 1990 and 1995. The openness dummy for MERCOSUR is negative and significant for the years 1990 and 1995. From these empirical results, the conclusion is likely to be drawn that there is little evidence of trade diversion resulting from an ASEAN+3 bloc.

## V. Natural Choice of a Trading Bloc in East Asia

Which regional integration agreements should East Asian countries pursue? Following Lorenz (1992), regionalization is distinguished from regionalism. The former is the natural outcome of the regional development process, while the latter is the intentional creation of preferential trade arrangements irrespective of any linkages between the prospective members. Intentionally creating a trading bloc is more costly because extra measures are required to create close common political and economic preferences, which are not needed in the case of a natural trading bloc. As Lorenz (1993) indicated, one of the essential prerequisites for a natural integration region is a common natural geographic or geo-political basis. When such ties exist, the next step might be to establish an institutional framework which facilitates and accelerates further trade between the prospective members by exploiting the existing economic and socio-cultural linkages among them. Growth and efficiency will be further enhanced if natural regions are supported by a regional trade agreement. Then the regionalization of natural trade regions includes two characteristics at the same time: the enhancement of existing economic and social affinities, as well as the reduction of negative measures of cross-border barriers. Tinbergen (1965) refers to such integration positive integration policies.

In the previous section, we identified that only ASEAN+3 shows a significant intra-regional trade bias in all tested cases. We found no evidence that any trading bloc among the Northeast Asian three

countries is naturally forming, while the combinations of ASEAN with each of the Northeast Asian countries do not remain significant when tested with ASEAN+3 at the same time. However, the coefficient of the ASEAN+3 dummy remains significant as before, even if it is tested with the bigger APEC group at the same time and the magnitude of the APEC effect is great. In addition, there is little evidence that ASEAN+3 diverts trade with rest of the world. When we, following Lorenz (1992), regard regionalization as a process of dynamic development of the patterns by way of building gravity centers, a regional trade agreement between ASEAN+3 countries would be the first step for regionalization in East Asia. Therefore, it is clear that the natural choice of the trading bloc in East Asia is ASEAN+3. The provision of a formal institutional framework will help to stabilize the existing unidentified ties among ASEAN+3 countries, such as a production network and socio-cultural linkages, and accelerate further growth and efficiency in this region.

Drysdale and Garnaut (1993) distinguish the concepts of market integration from discriminatory integration. Their essential criterion is the avoidance of trade diversion. Discriminatory integration refers to the institutional arrangements that discriminate against economies outside the region. However, all institutional integration does not deliberately aim at discriminating against non-members. As Lorenz (1993) discussed, discrimination and openness of trading systems depends little on the formal regime. Furthermore, the process of regional integration can be a catalyst in the reduction of a trading bloc's external protection (Sapir, 1992). Indeed, our empirical results show that ASEAN+3 does not generate trade diversion with the rest of world. The creation of ASEAN+3 as a formal trading bloc is likely to be de-

fined as market-driven integration. For a more successful and rapid development of the intra-regional market potential in East Asia, the creation of a formal regional trading bloc as a process of regionalization should now be considered.

## VI. Summary and Concluding Remarks

In this study, we examine whether any regional trading blocs are forming in East Asia. We modified the usual gravity equation slightly by introducing tariff rates, which surely impede bilateral trade, but are neglected in most empirical applications. Adding the factor of tariff rate increases the explanatory power of the regression considerably and its coefficient is highly significant.

We assess the various combinations of China, Japan, Korea and ASEAN for a possible natural trading bloc. Our results show that it is very difficult to find empirical evidence that the three Northeast Asian countries are forming a regional trading bloc. We find that ASEAN+3 shows a significant intra-regional trade bias. Even if APEC becomes a wider alternative bloc for East Asian countries, ASEAN+3 would continue to function as a regional trading bloc. Hence, we can conclude that ASEAN+3 is emerging as a strong candidate for a natural trading bloc in East Asia.

On the characteristics of ASEAN+3, we find that Japan has not established itself as the center of regional trade. In contrast, there is a special effect of the U.S. promoting intra-regional trade in ASEAN+3. More importantly, it turns out that ASEAN+3 is open to trade with the rest of the world. The creation of a regional trading bloc in East Asia is expected to contribute to a worldwide institutional framework of multilateralism, since trade relations with countries outside the region are unquestionably important to the development of the ASEAN+3 trading bloc. Hence, the evolution of ASEAN+3 into a formal trading agreement would further promote and reinforce both intra-regional trade and inter-regional trade.

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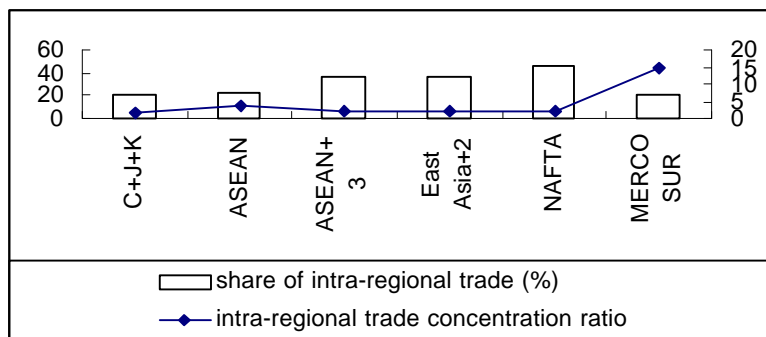
## Appendix I. Intra-Regional Trade in East Asia

A simple statistic that can be used to assess the degree of regionalization in world trade is intra-regional trade as a percentage of the region's total trade. The share of intra-regional trade for China, Japan and Korea was about 20 percent in 1999 and 2000. It was 21.6 percent for ASEAN, 35.7 percent for ASEAN+3 and 36.6 percent for East Asia+2. The share of intra-regional trade for MERCOSUR was 20.0 percent and 46.5 percent for NAFTA (see Figure a1.1).

Using regional trade share as a measure of regionalization is problematic; the bigger the group is, the higher the share of intra-regional trade. A better measure of regional concentration is the intra-regional concentration (intensity) ratio which adjusts intra-regional trade share by the region's share of world trade. The intensity ratio for regional blocs is greater than 1, implying that trade is geographically concentrated. Specifically, the ratio is 1.7 for China-Japan-Korea, 3.6 for ASEAN, 2.0 for ASEAN+3, 1.95 for East Asia+2, 2.2 for NAFTA and 14.6 for MERCOSUR. These values imply that ASEAN+3 is a more plausible bloc in East Asia than China-Japan-Korea.

Both statistics are ill-suited, however, for examining the issue of formation of regional blocs or existence of a regional bias in trade. They might simply reflect stylized factors in international economics. First, neighboring countries tend to trade more with each other. Second, large countries tend to trade more, and faster-growing economies tend to increase their mutual trade volume at a faster pace.

Figure A1.1. Intra-Regional Trade Share and Concentration Ratio



Source: IMF, *Direction of Trade Statistics Yearbook*, 2000.

Table A.1 Country List

1	ALG	Algeria	27	IRL	Ireland
2	ANG	Angola	28	ITA	Italy
3	ARG	Argentina	29	JPN	Japan
4	AUS	Australia	30	KEN	Kenya
5	AUT	Austria	31	KOR	Korea, Rep.
6	BHS	Bahamas	32	MYS	Malaysia
7	BHR	Bahrain	33	MEX	Mexico
8	BGD	Bangladesh	34	MAR	Morocco
9	BEL	Belgium-Luxembourg	35	NLD	Netherlands
10	BRA	Brazil	36	PER	Peru
11	CAN	Canada	37	PHL	Philippines
12	CHL	Chile	38	POL	Poland
13	CHN	China	39	PRT	Portugal
14	COL	Colombia	40	SGP	Singapore
15	DNK	Denmark	41	ZAF	South Africa
16	EGY	Egypt, Arab Rep	42	ESP	Spain
17	FIN	Finland	43	LKA	Sri Lanka
18	FRA	France	44	SWE	Sweden
19	DEU	Germany	45	CHE	Switzerland
20	GHA	Ghana	46	TWN	Taiwan
21	GRC	Greece	47	THA	Thailand
22	GTM	Guatemala	48	TUR	Turkey
23	HND	Honduras	49	GRBR	United Kingdom
24	HKG	Hong Kong, China	50	USA	United States
25	IND	India	51	URY	Uruguay
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