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Economics Department, University of California at Berkeley

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Department of Economics

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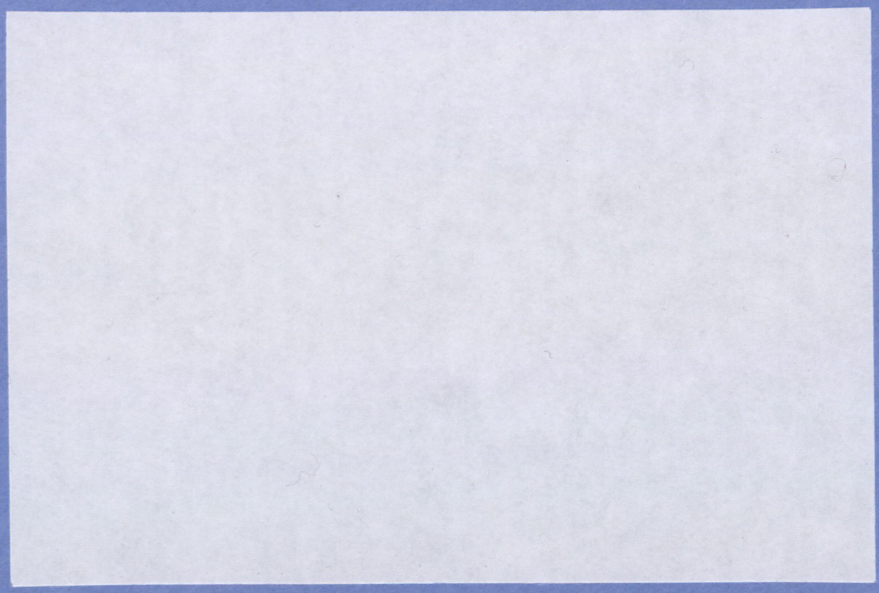

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Key words: Yen, bloc, Pacific, Asia, regional trading arrangements, gravity model
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Abstract

The paper reaches seven conclusions regarding the Yen Bloc that Japan is reputed to be forming in East Asia and the Pacific. (1) Gravity-model estimates of bilateral trade show that the *level* of trade in East Asia is biased intra-regionally, as it is within the European Community and within the Western Hemisphere, to a greater extent than can be explained naturally by distance. One might call these three regions "super-natural" blocs, in contrast to Krugman's "natural" trade blocs. (2) There is no evidence of a special Japan effect. (3) Once one properly accounts for rapid growth in Asia, the statistics do not bear out a *trend* toward intra-regional bias of trade flows. (4) The world's strongest trade grouping, whether judged by rate of change of intra-group bias or (as of 1990) by level of bias, is the one that includes the U.S. and Canada with the Asian/Pacific countries, i.e., APEC. (5) There is a bit of evidence of Japanese influence in East Asia's *financial markets*. Tokyo appears to have acquired significant influence over interest rates in a few Asian countries, though overall its influence is still smaller than that of New York. (6) Some of Japan's financial and monetary influence takes place through a growing role for the yen, at the expense of the dollar. The yen has become relatively more important in exchange rate policies and invoicing of trade and finance in the region. (7) But this trend is less the outcome of Japanese policymakers's wishes, than of the pressure from the U.S. government to internationalize the yen.

Is Japan Creating a Yen Bloc in East Asia and the Pacific?

Jeffrey A. Frankel

A debate got underway in 1991 over the advantages and disadvantages of a global trend toward three economic blocs -- the Western Hemisphere, centered on the United States; Europe, centered on the European Community; and East Asia, centered on Japan. Krugman (1991a), Bhagwati (1990, 1992), and Bergsten (1991), argue that the trend is, on balance, bad. Krugman (1991b) and Lawrence (1991c) argue that it is, on balance, good.[1] Most appear to agree, however, that a trend toward three blocs is indeed underway.

There is no standardly agreed definition of an "economic bloc." A useful definition might be a group of countries who are concentrating their trade and financial relationships with each other, in preference to the rest of the world. One might wish to add to the definition the criterion that this concentration is the outcome of government policy, or at least of factors that are non-economic in origin, such as a common language or culture. In two out of the three parts of the world, there have clearly been recent deliberate political steps toward economic integration. In Europe, the previously-lethargic European Economic Community has burst forth with the programs of the Single Market, European Monetary Union, and more. In the Western Hemisphere, we have the Caribbean Basin Initiative and (more seriously) the Canadian-U.S. Free Trade Agreement, followed by the North America Free Trade Area and Enterprise for the Americas Initiative.[2]

In East Asia, by contrast, overt preferential trading arrangements or other political moves to promote regional economic integration are lacking, as has been noted by others.[3] The ASEAN countries (Association of SouthEast Asian Nations), to be sure, are taking steps in the direction of turning what used to be a regional security group into a free trade area of sorts. But when Americans worry, as they are wont to do, about a trading bloc forming in Asia, it is generally not ASEAN that concerns them. Rather it is the possibility of an East Asia- or Pacific-wide bloc dominated by Japan.

Japan is in fact unusual among major countries in <u>not</u> having preferential trading arrangements with smaller neighboring countries. But the hypothesis that has been put forward is that Japan is forming an economic bloc in the same way that it runs its economy: by means of policies that are implicit, indirect, and invisible. Specifically, the hypothesis is that Japan operates, by means of such instruments as flows of aid, foreign direct investment, and other forms of finance, to influence its neighbors' trade toward itself.[4] This is a hypothesis that should not be accepted uncritically, but rather needs to be examined empirically.

After examining some of the relevant statistics, this paper argues that the evidence of an evolving East Asian trade bloc centered on Japan is not as clear as many believe. Trade between Japan and other Asian countries increased substantially in the late 1980s. But *intra-regional trade bias did not increase*, as it did, for example, within the European Community. The phrase "Yen Bloc"

could be interpreted as referring to the financial and monetary aspects implicit in the words, rather than to trade flows. The second half of the paper does find a bit of evidence of Japanese influence in the Pacific via financial and monetary channels, rather than via trade flows. But it does not find evidence that the country has taken deliberate steps to establish a Yen Bloc.

PART I: IS A TRADE BLOC FORMING IN PACIFIC ASIA?

We must begin by acknowledging the obvious: the greatly increased economic weight of East Asian countries in the world. The rapid outward-oriented growth of Japan, followed by the four East Asian NICs (Newly Industrialized Countries) and more recently by some of the other ASEAN countries, is one of the most remarkable and widely-remarked trends in the world economy over the last three decades. But when one asks whether a yen bloc is forming in East Asia, one is presumably asking something more than whether the economies are getting larger, or even whether economic flows among them are increasing. One must ask whether the share of intra-regional trade is higher, or increasing more rapidly, than would be predicted based on such factors as the GNP or growth rates of the countries involved.

Adjusting Intra-regional Trade for Growth

Table 1 reports three alternative ways of computing intra-

regional trade bias. The first part of the table is based on a simple breakdown of trade (exports plus imports) undertaken by countries in East Asia into trade with other members of the same regional grouping, versus trade with other parts of the world.[5] For comparison, the analogous statistics are reported for Western Europe (the EC Twelve) and for North America (the United States, Canada, and Mexico).

The share of intra-regional trade in East Asia increased from 33 per cent in 1980 to 37 per cent in 1989. Pronouncements that a clubbish trade bloc is forming in the region are usually based on figures such as these. But the numbers are deceptive.

All three regions show increasing intra-group trade in the 1980s. The region that has both the highest and the fastest-increasing degree of intra-regional trade is not Asia but the European Community, reaching 59 per cent in 1989. The share of intra-regional trade in East Asia has not even been increasing appreciably faster than that in North America.

Quite aside from the comparison with Europe, it is easy to be misled by intra-regional trade shares such as those reported in the first three rows of Table 1. If one allows for the phenomenon that most of the East Asian countries in the 1980s experienced rapid growth in <u>total</u> output and trade, then it is possible that there has in fact been no movement toward intra-regional bias in the evolving pattern of trade. The increase in the intra-regional share of trade that is observed in Table 1 could be entirely due to the increase in economic size of the countries. To take the

simplest case, imagine that there were no intra-regional bias in 1980, that each East Asian country conducted trade with other East Asian countries in the same proportion as the latter's weight in world trade (15 % [= 578/3842]). Total trade undertaken by Asian countries increased by 108 per cent in dollar terms over this nine-year period, while total trade worldwide increased by only 53 per cent. Even if there continued to be no regional bias in 1989, the observed intra-regional share of trade would have increased by one-third (to 20 % [=1200/5892]) due solely to the greater weight of Asian countries in the world economy.

Consider now the more realistic case where, due to transportation costs if nothing else, countries within each of the three groupings undertake trade that is somewhat biased toward trading partners within their own group (East Asia, North America, and the European Community). Although East Asian trade with other parts of the world increased rapidly [by 93 % [751.5/388.5]], trade with other Asian countries increased even more rapidly [by 137 % in dollar terms [448/189]]. Does this mean that the degree of clubbishness or within-region bias intensified over this period? No, it does not. Even if there was no increase at all in the bias toward intra-Asian trade, the more rapid growth of total trade and output experienced by Asian countries would show up as a rate of growth of intra-Asian trade that was faster than the rate of growth of Asian trade with the rest of the world.

Think of each East Asian country in 1980 as conducting trade with other East Asian firms in the same proportion as their weight

in world trade (15 %) multiplied by a regional bias term to explain the actual share reported in Table 1 (33 %). Then the regional bias term would have to be 2.18 (=.33/.15). An unchanged regional bias term multiplied by the East Asians' 1989 weight in world trade would predict that the 1989 intra-regional share of trade would be 44 per cent (2.18x.20 =.436). The actual intra-regional share, however, did not increase to nearly this level. Thus the East Asian bias toward within-region trade, far from rising, actually diminished in the 1980s! The implicit intra-regional bias fell to 1.9 (=.37/.20), as shown in the middle rows of Table 1.[6]

A Test on Bilateral Trade Flows

The analysis should be elaborated by use of a systematic framework for measuring what patterns of bilateral trade are normal around the world: the so-called "gravity" model.[7] A dummy variable can then be added to represent when both countries in a given pair belong to the same regional grouping, and one can check whether the level and time trend in the East Asia/Pacific grouping exceeds that in other groupings. We do not currently have measures of historical, political, cultural and linguistic ties. Thus it will be possible to interpret the dummy variables as reflecting these factors, rather than necessarily as reflecting discriminatory trade policies. Perhaps we should not regret the merging of these different factors in one term, because as noted there are in any case no overt preferential trading arrangements on which theories

of a Japanese trading bloc could rely.[8]

The dependent variable is trade (exports plus imports), in log form, between pairs of countries in a given year. We have 63 countries in our data set, so that there are 1,953 data points (=63x62/2) for a given year. There are some missing values (245 of them in 1985, for example), normally due to levels of trade too small to be recorded.[9] The possibility that that the exclusion of these data points might bias the results, or that the results might be subject to heteroscedasticity because country size varies so much, is considered in Frankel and Wei (1992b). The results appear to be robust with respect to these problems.

One would expect the two most important factors in explaining bilateral trade flows to be the geographical distance between the two countries, and their economic size. These factors are the essence of the gravity model, by analogy with the law of gravitational attraction between masses. A large part of the apparent bias toward intra-regional trade is certainly due to simple geographical proximity. Indeed Krugman (1991b) suggests that most of it may be due to proximity, so that the three trading blocs are welfare-improving "natural" groupings (as distinct from "unnatural" trading arrangements between distant trading partners such as the United States and Israel). Although the importance of distance and transportation costs is clear, there is not a lot of theoretical guidance on precisely how they should enter. We experiment a bit with functional forms. We also add a dummy

"Adjacent" variable to indicate when two countries share a common border.

The basic equation to be estimated is:

$$\log(T_{ij}) = \alpha + \beta_1 \log(GNP_i GNP_j) + \beta_2 \log(GNP/pop_i GNP/pop_j)$$
$$+ \beta_3 \log(DISTANCE) + \beta_4 (ADJACENT) + \gamma_1 (EEC_{ij}) + \gamma_2 (WH_{ij}) + \gamma_3 (ASIA_{ij}) + u_{ij}.$$

The last four explanatory factors are dummy variables. The goal, again, is to see how much of the high level of trade within the East Asian region can be explained by simple economic factors common to bilateral trade throughout the world, and how much is left over to be attributed to a special regional effect.[10]

The practice of entering GNPs in product form is empirically well-established in bilateral trade regressions. It can be easily justified by the modern theory of trade under imperfect competition.[11] In addition there is reason to believe that GNP per capita has a positive effect, for a given size: as countries become more developed, they tend to specialize more and to trade more. It is also possible that the infrastructure necessary to conduct trade -- ports, airports, etc. -- becomes better-developed with the level of GNP per capita.

The results are reported in Tables 2, 3, and 4. We found all three variables to be highly significant statistically (> 99%

level). The coefficient on the log of distance was about -.56, when the adjacency variable (which is also highly significant statistically) is included at the same time. This means that when the distance between two non-adjacent countries is higher by 1 per cent, the trade between them falls by about .56 per cent.[12]

We tested for possible non-linearity in the log-distance term, as it could conceivably be the cause of any apparent bias toward intra-regional trade that is left after controlling linearly for distance. Quadratic and cubic terms turned out to be not at all significant. An alternative specification that fits at least as well as the log is to include the level of distance and its square. The significant positive coefficient on the latter confirms the property of the log that "trade resistance" increases less-than-linearly with distance. The results for the other coefficients are little affected by the choice of functional form for proximity. We report here only results using the log of distance.

The estimated coefficient on GNP per capita is about .29 as of 1980, indicating that richer countries do indeed trade more, though this term declines during the 1980s, reaching .08 in 1990. The estimated coefficient for the log of the product of the two countries' GNPs is about .75, indicating that, though trade increases with size, it increases less-than-proportionately (holding GNP per capita constant). This presumably reflects the widely-known pattern that small economies tend to be more open to international trade than larger, more diversified, economies.

If there were nothing to the notion of trading blocs, then

these basic variables would soak up all the explanatory power. There would be nothing left to attribute to a dummy variable representing whether two trading partners are both located in the same region. 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. But we found that dummy variables for intra-regional trade <u>are</u> statistically significant, both in East Asia and elsewhere in the world. If two countries are both located in the Western Hemisphere for example, they will trade with each other by an estimated 70 per cent more than they would otherwise, even after taking into account distance and the other gravity variables [exp(.53)=1.70]. Intra-regional trade goes beyond what can be explained by proximity.

The empirical equation is as yet too far-removed from theoretical foundations to allow conclusions to be drawn regarding economic welfare. But it is possible that the amount of intra-regional bias explained by proximity, as compared to explicit or implicit regional trading arrangements, is small enough in our results that those arrangements are welfare-reducing. This could be the case if trade-diversion outweighs trade creation. Inspired by Krugman's (1991a,b) "natural trading bloc" terminology, we might then refer to the observed intra-regional trade bias as evidence of "super-natural" trading blocs. The issue merits future research.

When the boundaries of the Asian bloc are drawn along the lines of those suggested by Malaysian Prime Minister Mahatir in his proposed East Asian Economic Caucus, which excludes Australia and

New Zealand (and also China, in the version tested here), the coefficient on the Asian bloc appears to be the strongest and most significant of any in the world. Even when the boundaries are drawn in this way, however, there is no evidence of an increase in the intra-regional bias of Asian trade during the 1980s: the estimated coefficient actually decreases somewhat from 1980 to 1990. Thus the gravity results corroborate the back-of-the-envelope calculation reported in the preceding section. The precise pattern is a decrease in the first half of the decade, followed by a very slight increase in the second half, matching the results of Petri (1991).[13] None of these changes over time is statistically significant.

It is perhaps surprising that the estimated level of the intra-regional trade bias was higher in East Asia as of 1980 than in the other two regions. One possible explanation is that there has historically been a sort of "trading culture" in Asia. To the extent that such a culture exists and can be identified with a particular nation or ethnic group, I find the overseas Chinese to be a more plausible factor than the Japanese. But there are other possible regional effects that may be showing up spuriously as an East Asian bloc, to be considered below.

Of the three trading blocs, the EEC and the Western Hemisphere are the two that show rapid intensification in the course of the 1980s. Both show an approximate doubling of their estimated intra-regional bias coefficients. As of 1980, trade within the EEC is not strong enough -- after holding constant for the close

geographical proximity and high incomes per capita of European countries -- for the bias coefficient of .2 to appear statistically significant. The EEC coefficient increased rapidly in level and significance in the first half of the 1980s, reaching about .4 in by 1985, and continued to increase a bit in the second half. The effect of two countries being located in Europe per se, when tested, does not show up as being nearly as strong in magnitude or significance as the effect of membership in the EC per se.

The Western Hemisphere coefficient experienced all its increase in the second half of the decade, exceeding .9 by 1990. The rapid increase in the Western Hemisphere intra-regional bias in the second half of the 1980s is in itself an important new finding. The recovery of Latin American imports from the United States after the compression that followed the 1982 debt crisis must be part of this phenomenon. The Canada-U.S. Free Trade Agreement signed in 1988 may also be part of the explanation.

We consider a sequence of nested candidates for trading blocs in the Pacific. The significance of a given bloc effect turns out to depend on what other blocs are tested at the same time. One logical way to draw the boundaries is to include all the countries with eastern coasts on the Pacific, as in the statistics considered in the preceding section. We call this grouping "Asian Pacific" in the tables. Its coefficient and significance level are both higher than the EAEC dummy. When we broaden the bloc-search wider and test for an effect of APEC (Association of Pacific Economic Cooperation), which includes the United States and Canada in with

the others, it is highly significant. The significance of the Asian Pacific dummy completely disappears. The EAEC dummy remains significant in 1980 and 1990, though at a lower level than the initial results that did not consider any wider Pacific groupings.

APEC appears to be the correct place to draw the boundary. When we test for the broadest definition of a Pacific bloc, including Latin America, it is not at all significant, and the other coefficients do not change. (It is called "Pacific Rim" in the tables.) It remains true that the intra-regional biases in the EEC and Western Hemisphere blocs each roughly doubled from 1980 to 1990, while intra-regional biases in the Asia and Pacific areas did not increase at all. The only surprising new finding is the APEC effect: the United States and Canada appear to be full partners in the Pacific bloc, even while simultaneously belonging to the significant but distinct Western Hemisphere bloc. The APEC coefficient is the strongest of any. Its estimate holds relatively steady at 1.3 (1980), 1.0 (1985), and 1.2 (1990). The implication is that a pair of APEC countries trade three times as much as two otherwise-similar countries [exp(1.2)=3.3].[14]

One possible explanation for the apparent intra-regional trade biases within East Asia and within the APEC grouping is that transportation between Pacific Asian countries is mostly by water, while transportation among European or Western Hemisphere countries is more often overland, and that ocean-shipping is less expensive than shipping by rail or road. This issue bears further investigation. (Wang (1992) enters land distance and water distance separately in a gravity model. She finds a small, though statistically significant, difference in coefficients.) The issue

of water versus land transport should not affect results regarding changes in intraregional trade bias in the 1980s, however, given that the nature of shipping costs does not appear to have changed over as short a time span as five or ten years.

Several further questions naturally arise. ASEAN negotiated a preferential trading arrangement within its membership in 1977 although serious progress in removal of barriers did not get underway until 1987.[15] In early 1992, the members proclaimed plans for an ASEAN Free Trade Area, albeit with exemptions for many sectors. Does this grouping constitute a small bloc nested within the others? We include in our model a dummy variable for common membership in ASEAN. It turns out to have a significant coefficient only if none of the broader Asian blocs are included. The conclusion seems to be that ASEAN is not in fact functioning as a trade bloc.[16]

We know that Singapore and Hong Kong are especially open countries, and engage in a large amount of entrepot trade. A dummy variable for these two countries' trade with other Asian Pacific countries is highly significant when it is included, as shown in the first row of Table 5. Its presence reduces a bit the coefficient on the East Asian grouping, but does not otherwise change the results.

We also know that most East Asian countries are very open to trade of all sorts. So we added a dummy variable to indicate when at least one of the pair of countries is located in East Asia, to supplement the dummy variable that indicates when both are. Its

coefficient is significant. It is also positive, which appears to rule out any "trade-diversion" effects arising from the existence of the East Asian bloc: these countries trade an estimated 22 per cent more with all parts of the world, other things equal, than do average countries [exp(.20)=1.22]. The addition of the openness dummy reduces a bit more the level and significance of the East Asian bloc dummy. Indeed, when the APEC bloc dummy and East-Asian-openness dummy are both added at the same time, the East Asian bloc term becomes only marginally significant in 1980 and insignificant in 1985 and 1990. There may be no East Asian bloc effect at all!

We tried a few more extensions as well. We disaggregated trade into manufactured goods, agricultural products, fuels, and other raw materials. The results changed little. Raw materials show the greatest Asian bloc effect if judged by the estimated coefficient. Manufactures shows the greatest effect if judged by t-statistics. Desirable extensions for the future, besides further disaggregation, include adding factor endowment terms.

What about bilateral trade between Asian/Pacific countries and Japan in particular? Like intra-regional trade overall, trade with Japan increased rapidly in the second half of the 1980s. Most of this increase merely reversed a decline in the first half of the 1980s however.[17] More importantly, the recent trend in bilateral trade between Japan and its neighbors can be readily explained as the natural outcome of the growth in Japanese trade overall and the growth in trade levels attained by other Asian countries overall. Lawrence (1991b) has calculated that, out of the 28 percentage

percentage points is attributable to the commodity mix of these countries' exports. There is no residual to be attributed to Japan's development of special trading relations with other countries in its region.[18]

We confirmed this finding (though without as yet decomposing trade by commodity) by adding to our gravity model a separate dummy variable for bilateral Asian trade with Japan in particular. It was not even remotely statistically significant in any year, and indeed the point estimate was a small negative number, as is shown in Table 5. Thus there was no evidence that Japan has established or come to dominate a trading bloc in Asia.

To summarize the most relevant effects, if two countries both lie within the boundaries of APEC, they trade with each other a little over three times as much as they otherwise would. The nested EAEC bloc is less strong (especially if one allows also for the openness of East Asian countries), and has declined a bit in magnitude and significance during the course of the 1980s. The Western Hemisphere and EC blocs, by contrast, intensified rapidly during the decade. Indeed, by 1990, the Western Hemisphere bloc was stronger than the EAEC bloc, if one takes into account the existence of the APEC effect. There was never a special Japan effect within Pacific Asia.

In short, beyond the evident facts that countries near each other trade with each other, and that Japan and other Asian countries are growing rapidly, there is no evidence that Japan is concentrating its trade with other Asian countries in any special way, nor that they are collectively moving toward a trade bloc in the way that Western Europe and the Western Hemisphere appear to

In short, beyond the evident facts that countries near each other trade with each other, and that Japan and other Asian countries are growing rapidly, there is no evidence that Japan is concentrating its trade with other Asian countries in any special way, nor that they are collectively moving toward a trade bloc in the way that Western Europe and the Western Hemisphere appear to be. We now turn from trade to finance.

PART II. JAPAN'S FINANCIAL INFLUENCE IN THE REGION

In the case of financial flows, proximity is less important than it is for trade flows. For some countries the buying and selling of foreign exchange and highly-rated bonds is characterized by the absence of significant government capital controls, transactions costs or information costs. In such cases, there would be no particular reason to expect greater capital flows among close countries than distant ones. Rather, each country would be viewed as depositing into the world capital pool, or borrowing from it, whatever quantity of funds it wished at the going world interest rate. Thus even if we could obtain reliable data on bilateral capital flows (which we cannot), and whatever pattern they happened to show, such statistics would not be particularly interesting.

Tokyo's Influence on Regional Financial Markets

Many Asian countries still have substantial capital controls, and financial markets that are in other respects less than fully developed. Even financial markets in Singapore and Hong Kong, the most open in Asia, retain some minor frictions. Where the links with world capital markets are obstructed by even small barriers, it is an interesting question to ask whether those links are stronger with some major financial centers than with others. This question is explored econometrically below.

Information costs exist for equities, and for bonds with some risk of default. These costs may be smaller for those investors who are physically, linguistically, and culturally close to the nation where the borrower resides. Proximity clearly matters as well in the case of direct investment, in part because much of direct investment is linked to trade, in part because linguistic and cultural proximity matter for direct investment. We begin our consideration of capital links by looking at direct investment.

Foreign Direct Investment

Table 6 shows the standard Ministry of Finance figures for Japanese direct investment. The steady stream of direct investment by Japanese firms in East Asia and the Pacific (including Australia) has received much attention. But the table shows that, whether measured in terms of annual flows or cumulated stocks, Japan's direct investment in the region is approximately equal to its investment in Europe, and is much less than its investment in

North America.[19]

It has been argued that once one scales the Table 6 figures for GNP among the host countries, an Asian bias to Japanese direct investment might indeed appear.[20] But if one scales the FDI figures by the host region's role in world trade, one finds that Japan's investment in Asia and Oceania is almost exactly in proportion to their size. There is no regional bias. Its FDI in the United States and Canada, on the other hand, is more than twice what one would expect from their share of world trade. Japan's investment in Europe is about half the continent's share of trade.

Furthermore, Ramstetter (1991a, p.95-96; 1991b, p.8-9) has forcefully pointed out that the standard Ministry of Finance figures on Japanese foreign direct investment actually represent statistics on investment either approved by or reported to the government, and greatly overstate the extent of true Japanese investment in developing countries. The more accurate balance of payments data from the Bank of Japan show a smaller percentage of investment going to Asia.

Tokyo vs. New York Effects on Asian Interest Rates

Statistics also exist on Japanese portfolio investment. But, in the case of portfolio capital, looking at quantity data is not as informative as looking at price data -- that is, at interest rates. For one thing, the quality of the data on interest rates is much higher than the quality of the data on capital flows. For another, the interest rate test is more appropriate conceptually.

If the potential for arbitrage keeps the interest rate in a given Asian country closely in line with, say, Tokyo interest rates, then this constitutes good evidence of close links between the two national capital markets, even if the amount of actual arbitrage or other capital flow that takes place within a given period happens to be small.

Many East Asian countries have moved to liberalize and internationalize their financial markets over the last ten to fifteen years.[21] A number of studies have documented Japan's removal of capital controls over the period 1979-84 by looking at the power of arbitrage to equalize interest rates between Tokyo and New York or London.[22] Australia and New Zealand, while lagging behind Japan, also show signs of liberalization during the course of the 1980s.[23] Hong Kong and Singapore register impressively open financial markets, showing smaller interest differentials even than some open European countries like Germany. (Hong Kong has long had open capital markets. Singapore undertook a major liberalization in 1978, though it has tried to segment its domestic money market from its offshore "Asia dollar market."[24]) Malaysia has officially liberalized, following Singapore,[25] though its covered differential has remained considerably higher.

We can apply a simple test to the hypothesis that a particular Asian country is dominated financially by Japan, versus the alternative hypothesis that ties to capital markets in the other industrialized countries are equally strong. We run the following OLS regression to see how the interest rate in a typical Asian

country depends on interest rates in Tokyo and New York.

$$i_t^a = \alpha + \beta_1 i_t^T + \beta_2 i_t^{NY} + e_t$$

Under the null hypothesis that the country's financial markets are insufficiently developed or liberalized to be directly tied to any foreign financial markets, the coefficients on foreign interest rates should be zero. Under the alternative hypothesis that the country's financial markets are closely tied to those in Tokyo, the coefficient on Tokyo interest rates should be closer to 1 than to 0; and similarly for New York.[26]

Table 7 presents estimates for three-month interest rates in Hong Kong and Singapore, on quarterly data. For the Hong Kong interest rate, the influence of the New York market appears very strong. This is not surprising: not only does the Colony have open financial markets, but its currency has since October 1983 been pegged to the U.S. dollar,[27] so that there is nothing to inhibit perfect arbitrage between its interest rates and U.S. interest rates. Neither Tokyo, London, nor Frankfurt, has significant influence in Hong Kong on average over the sample period (from 1976 to 1989). For the Singapore interest rate, the influence of New York is again very significant; but now there is also a significant, though smaller, weight on Tokyo. The evidence suggests that both countries have had open financial markets ever since the mid-1970s, with New York having the dominant influence, but with Tokyo also having a one-quarter effect in the case of Singapore.

To see whether the influence of the foreign financial centers

changed over the course of the sample period, we can allow for time trends in the coefficients, also reported in Table 7. For Hong Kong, it is clear that London used to have a strong influence, and equally clear that the British influence has been diminishing over time. For Singapore, there is no sign of change in New York's role, but there is weak evidence of a gradually increasing role for Tokyo.

The next step is to expand the sample of countries. Some Asian countries, such as Korea and Taiwan, did not seriously begin to open their financial markets to external influence by any foreign center, until the late 1980s. To obtain more observations, we now switch to monthly data. Preliminary results for the period 1988-91 found a dominant role for Tokyo interest rates in Singapore and Taiwan, a dominant role for New York interest rates in Hong Kong and Australia, and apparently strong roles for both in Korea.[28] Tests that also allowed a role for Frankfurt and London interest rates found apparently significant effects for the latter in Australia and New Zealand. But most of these results were tainted by high levels of serial correlation.

In Table 8 we use conservative standard errors, to allow for the problem created by serial correlation. We expand the set of countries still further, to a set of ten (with three alternative measures of the Korean interest rate). The time period is September 1982 to March 1992. The time trends in the coefficients tell us that New York seems to be gaining influence at the expense of Tokyo in the English-speaking countries of the Pacific Rim

(Australia, Canada, and New Zealand), while the reverse is occurring in a number of East Asian countries. The observed shift in influence from New York interest rates to Tokyo interest rates is highly significant in the case of Indonesia, and somewhat less so in the case of Korea. It is positive but not significant (when the conservative standard errors are used) for Hong Kong, Singapore and Malaysia.

These tests leave some important questions unanswered. Are the barriers that remain between a given country and the major world financial centers due to currency factors or country factors? Most of the Asian countries experience frequent changes in their exchange rates against the yen and the dollar. Financial markets in a country like Singapore could be very open and yet observed interest rates could differ from those in Tokyo or New York because of premiums meant to compensate investors for the possibility of changes in the exchange rate. The question of whether the yen is playing an increasing role in the exchange rate policies of East Asian countries is an important one to address, but it should be kept distinct from the question whether financial links to Tokyo (irrespective of currency) are strengthening.

We can take out currency factors by using the forward exchange market. The necessary data are available for six of the countries. We simply express the foreign interest rates so as to be "covered" or hedged against exchange risk. Doing so changes the 1988-91 results for Australia and Singapore toward a Tokyo effect that is smaller than the New York effect. Most coefficients remain

significant, despite the obvious multicollinearity between covered U.S. and Japanese interest rates.[29]

Returning to the longer 1982-92 time period to look for trends in the coefficients of the covered interest rates, we find that the observed upward trends for Tokyo influence in Singapore and Malaysia are not statistically significant (when conservative standard errors are used). Singapore, like Hong Kong, rather appears simply to obey a covered interest parity relationship vis-a-vis dollar interest rates.[30]

For six of these countries, there exists another way of correcting for possible exchange rate changes: direct data on forecasts of market participants collected in a monthly survey by the Currency Forecaster's Digest of White Plains, N.Y.[31] One advantage of using the survey responses to measure expected exchange rate changes is that the data allow us to test explicitly whether there exists an exchange risk premium that creates an international differential in interest rates even in the absence of barriers to international capital flows. Such a differential would be compensation to risk-averse investors for holding assets that they view as risky.[32] An advantage of the Currency Forecasters' Digest data in particular is that they are available even for countries like Taiwan and Korea where financial markets are less developed. A potential disadvantage is the possibility that survey data measure the expectations of market participants imperfectly.

For Singapore, the survey data corroborate the finding from the forward rate data that, once expected depreciation is

eliminated as a factor, the New York effect dominates the Tokyo effect. For Korea, the survey data also show that the Tokyo effect becomes smaller than the New York effect. For Australia and Taiwan, both effects largely disappear.[33]

The Role of the Yen in Asian Exchange Rate Policies

The finding that eliminating exchange rate expectations from the calculation leaves Tokyo with relatively little effect on local interest rates in most of these countries does not necessarily mean that the Japanese influence is not strong. It is possible, rather, that much of the influence in the Pacific comes precisely through the role of the yen. If Pacific countries assign high weight to the yen in setting their exchange rate policies, then their interest rates will be heavily influenced by Japanese interest rates.

No Asian or Pacific countries have ever pegged their currencies to the yen in the post-war period. But neither are there any Pacific countries that the International Monetary Fund classifies as still pegging to the U.S. dollar. (As already mentioned, Hong Kong pegs to the dollar; but the Colony is not an official member of the IMF.) Malaysia and Thailand, and a number of Pacific island countries, officially peg to a basket of major currencies and are thought to give weight to both the dollar and yen, but the weights are not officially announced.

It is interesting to estimate econometrically the weights given to the dollar, yen, and other major currencies in exchange

rate policies of Asian/Pacific countries, especially those who follow a basket peg but do not officially announce the weights. This involves regressing changes in the value of the currency in question against changes in the value of the yen, dollar, etc. (We work in changes rather than levels, among other reasons, because exchange rates have been widely observed to behave as unit-root processes.)

There is a methodological question of what numeraire should be used to measure the value of the currencies. A simple solution is to use the SDR as numeraire. This approach suffers from the drawback that the SDR is itself a basket of five major currencies including the dollar and yen. An alternative approach is to use purchasing power over local goods (the inverse of the local price level) as the numeraire. Whatever the numeraire, under the null hypothesis that a particular currency is pegged to the dollar or yen, or to a weighted basket, the regression results should show this clearly, featuring even a high R^2. We focus here on the purchasing power measure.

Regressions of changes in the real value of the Hong Kong dollar against changes in the value of the five major currencies show highly significant coefficients on the U.S. dollar during the periods 1974-80 and 1984-90 [not reported here]. The weight on the dollar is statistically indistinguishable from 1 during most of the latter 7-year period, and the R^2 reaches .96 during the last four years. Occasional sub-periods show apparently significant weights on other currencies (the yen during 1979-81, the franc during 1983-

85, and the mark during 1986-88). Overall, however, the numbers bear out Hong Kong's peg to the dollar.

Regressions of changes in the real value of the Malaysian ringgit against the five major currencies, reported in Table 9a, give a large significant weight to the dollar. Some sub-periods show a significant weight on the mark, and during 1986-88 even the pound is significant. But the yen is not significant during any three-year sub-period. The constant term is negative (and statistically significant), indicating a trend depreciation, and the R^2 is fairly low, indicating that the basket "peg" was loose (even if one allows for a crawling peg).[34]

The Singapore dollar shows significant weights (of about .2 each) on the U.S. dollar and mark during the period 1974-77, as reported in Table 9b. The regression for 1977-79 shows a rough basket peg (R^2=.83) with significant weights of .09 on the yen, .47 on the dollar, .25 on the mark, and .09 on the pound. The weight on the dollar diminishes thereafter, and the weight on the yen increases. By 1983-85, the yen weight (at a significant .20) has temporarily passed the dollar weight (at a significant .19). From 1986 to 1990 only the dollar is significant.

The results for the real value of the Thai baht, reported in Table 9c, show a very close peg to the dollar from 1974 to 1980, whereupon the dollar weight falls somewhat. Beginning in 1986, a pattern emerges of significant weights on the yen and pound, in addition to the dollar. During the period 1988-90, the baht exhibits a close-to-perfect peg (R^2=.99) to a basket with estimated

weights of .82 on the dollar, .13 on the yen, .06 on the mark, and .02 on the pound.

Korea also claimed to have a sort of basket peg in the 1980s, but with large adjustments. Regressions of the change in the real value of the won show a statistically significant weight on the value of the dollar during the period April 1980 to March 1986, with an estimated coefficient of .4 to .5. (The Canadian dollar, which was reputed to be included in the Korean basket, also shows up with a significant coefficient of .2 during part of the period.) There is a significant constant term (the "alpha") during this period: the value of the won declined during the early 1980s, whether measured by inflation or depreciation, relative to foreign currencies. The dollar, like the other major currencies, is insignificant during the period April 1985 to March 1987. Its influence re-emerges from April 1986 to March 1988. But then during the final two-year sub-period, April 1988 to March 1990, the yen (with a highly significant coefficient estimated at .18) suddenly eclipses the dollar (with an insignificant coefficient of .11).[35]

To summarize, there is some evidence of increased yen influence in the case of the Singapore dollar in the early 1980s and the Thai baht in the late 1980s. The only place where the yen appears to have become as important as the dollar is Korea in the period since 1988.[36]

The Role of the Yen in Reserves and Invoicing

There is other evidence that the yen is playing an increasing role in the region. As Table 10 shows, Asian central banks in the course of the 1980s increased their holdings of yen from 13.9 per cent of their foreign exchange reserve portfolios to 17.1 per cent.[37] Foreign exchange market trading in the regional financial centers of Singapore and Hong Kong, though still overwhelmingly conducted in dollars, now shows a much higher proportion of trading in yen than is the case in Europe.[38]

The yen is also being used more widely to invoice lending and trade in Asia. The countries that incurred large international debts in the 1970s and early 1980s subsequently shifted the composition away from dollar-denominated debt and toward yen-denominated debt. Table 10 shows that the yen share among five major Asian debtors nearly doubled between 1980 and 1988, entirely at the expense of the dollar. Table 11 shows that the share of trade denominated in yen is greater in Asia than in other regions, and that there was an especially rapid increase from 1983 to 1990 in the share of Asian imports denominated in yen.[39] Overall, however, it must be concluded that the role of the yen in East Asia is still not proportionate to Japan's importance in trade.

PART III: CONCLUSIONS

We may draw eight conclusions.

(1) The <u>level</u> of trade in East Asia, like trade within the European

Community and within the Western Hemisphere, is biased toward intraregional trade, to a greater extent than can be explained naturally by distance. By way of contrast to Krugman's "natural" trade blocs, one might call these three regions "super-natural" blocs. (2) There is no evidence of a special Japan effect within Asia. (3) Although growth in Japan, the four NICs, and other East Asian countries, is rapidly increasing their weight in world output and trade, the statistics do not bear out a trend toward intra-regional bias of trade and direct investment flows. (5) The intra-regional trade bias did increase in Europe in the 1980s, in the Western Hemisphere in the late 1980s, and in the grouping that includes the U.S. and Canada together with the Asian/Pacific countries, i.e., APEC. (6) The APEC trade grouping appears to be the world's strongest, whether judged by rate of change of intra-group bias or (as of 1990) by level of bias. Far from being shut out of a strong Asian bloc centered on Japan, the United States and Canada are in the enviable position of belonging to both of the world's two strongest groupings.

(7) There is a bit of evidence of Japanese influence in the East Asia's financial markets, as opposed to trade. Tokyo appears to have increasing influence over interest rates in Singapore, Korea and Indonesia. Overall however, its influence is still smaller than that of New York. (8) Some of Japan's financial influence takes place through a growing role for the yen, at the expense of the dollar. There has been a gradual increase in the yen's relative importance in invoicing of trade and finance in the

region, and in some countries' exchange rate policies.

This still leaves a question raised at the beginning of this essay. Is Japan undertaking deliberate policy measures to increase its monetary and financial role? Gradually-increasing use of the yen internationally is primarily the outcome of private decisions by importers, exporters, borrowers and lenders. It is difficult to see signs of deliberate policy actions taken by the Japanese government to increase its financial and monetary influence in Asia. To the contrary, until recently, the Japanese government has resisted whatever tendency there may be for the yen to become an international currency in competition with the dollar.

It has been the U.S. government, in the Yen/Dollar Agreement of 1984 and in subsequent negotiations, that has been pushing Japan to internationalize the yen, to promote its worldwide use in trade, finance, and central bank policies.[40] It has also been the U.S. government that has been pushing Korea and other East Asian NICs to open up their financial markets, thereby allowing Japanese capital and Japanese financial institutions to enter these countries. It has again been the U.S. government that has been pushing Korea and Taiwan to move away from policies to stabilize the value of their currencies against the dollar.[41] The increasing role of the yen in Pacific Asia may or may not be a good idea. But it is an idea that originated in Washington, not in Tokyo.

* * *

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Notes

1. Those who fear the blocs do so because they think they will tend to be protectionist. Froot and Yoffie (1991) in this volume pursue this logic, and point out some implications of foreign direct investment. Krugman (1991b) argues in favor of the three blocs on the grounds that they are "natural," in a sense explained below. Lawrence's (1991c) argument in favor of blocs is that they can cement politically pro-liberalization sentiment in individual countries.

2. Reviews of recent developments in regional trading arrangements are offered by Fieleke (1992) and Torre and Kelly (1992).

3. E.g., Petri (1992).

4. For one of many examples, see Dornbusch (1989).

5. These statistics are presented in more detail in Table 1 in Frankel, 1991c.

6. Petri (1991) calls this measure the "double-relative," while Drysdale and Garnaut (1992) and Anderson and Norheim (1992) use similar calculations of "intensity-of-trade indexes." All find that, once one holds constant for growth in this simple way, the existing intra-regional bias in Asia did not increase in the 1980s.

7. See Deardorff (1984, pp.503-04) for a survey of the (short) subject of gravity equations. Wang and Winters (1991) and Hamilton and Winters (1992) have recently applied the gravity model to th question of potential Eastern European trade patterns.

8. Krugman (1991) has made a crude first pass at applying the gravity model to the question whether Europe and North America are separate trading blocs, but did not get as far as including other countries, or including a variable for distance.

9. The list of countries, and regional groupings, appears in an Appendix.

10. Details on the data sources, list of countries, groupings, method for computing distances, etc., are available on request.

11. The specification implies that trade between two equal-sized countries (say, of size .5) will be greater than trade between a large and small country (say, of size .9 and .1). This property of models with imperfect competition is not a property of the classical Heckscher-Ohlin theory of comparative advantage. Helpman (1987) and Helpman and Krugman (1985, section 1.5). Foundations for the gravity model are also offered by Anderson (1979) and other papers surveyed by Deardorff (1984, pp.503-06).

12. The coefficient on the log of distance was about .8 when the adjacency variable was not included.

13. Petri infers, from the data on intra-regional trade shares, a decrease in East Asian interdependence up to the middle of the 1980s, followed by a reversal in the second half of the decade.

14. Others have emphasized the high volume of trans-Pacific trade. But it has been difficult to evaluate such statistics when no account is taken of these countries' collective size. A higher percentage of economic activity will consist of intra-regional trade in a larger region than in a smaller region, even when there is no intra-regional bias, merely because smaller regions tend by their nature to trade across their boundaries more than larger ones. In the limit, when the unit is the world, 100 per cent of trade is intra-"regional."

15. Jackson (1991).

16. In tests similar to ours, Wang (1992), Wang and Winters (1991), and Hamilton and Winters (1992) found the ASEAN dummy to reflect one of the most significant trading areas in the world. That they did not include a broader dummy variable for intra-Asian trade may explain the difference in results.

17. Petri 1991.

18. The empirical literature on whether Japan is an outlier in its trading patterns, particularly with respect to imports of manufactures, includes Saxonhouse (1989), Noland (1991) and Lawrence (1991a), among others.

19. See also Komiya and Wakasugi (1991).

20. Nigel Holloway, "Half-full, half empty," Far Eastern Economic Review, December 1991, p.69.

21. Frankel (1991a) presents the 1980s evidence for Japan, Australia, New Zealand, Singapore, Hong Kong and Malaysia. Faruqee (1991) examines interest differentials for Korea, Malaysia, Singapore and Thailand (vis-a-vis yen interest rates in London), but does not take into account exchange rate expectations.

22. These include Otani and Tiwari (1981), Ito (1986), and Frankel (1984). The interest rates in the calculations are covered on the forward exchange or Eurocurrency markets so as to avoid exchange risk. [Tests that look at real or uncovered interest differentials, rather than covered interest differentials, include Ito (1988) and Fukao and Okubo (1984).]

23. The frequently large negative covered differential that had been observed for Australia up to mid-1983 (see, e.g., Argy, 1987) largely vanished thereafter.

24. See Moreno (1988). Edwards and Khan (1985) includes another test of covered interest parity for Singapore.

25. Abidin (1986) and Glick and Hutchison (1990, p.45).

26. It should be noted that if capital markets in Tokyo and New York are closely tied to each other, as they indeed are, then multicollinearity might make it difficult to obtain statistically significant estimates. But this does not mean that there is anything wrong with the test. A finding that the coefficient on the Tokyo interest rate is statistically greater than 0, or than the coefficient on the New York interest rate, remains valid.

27. See, e.g., Balassa and Williamson (1990, p.32).

28. Frankel (1991c), Table 4, or NBER Working Paper No. 4050, Table 7.

29. Table 4 in Frankel (1991c), or Table 7 in NBER Working Paper No. 4050. (The Durbin-Watson statistics improve substantially when the forward rates are included, confirming that the equation that uses covered interest rates is a more appropriate specification.)

30. These results are from Tables 12a and 12b in Chinn and Frankel (1992).

31. The Currency Forecasters' Digest data is proprietary, and was obtained by subscription by the Institute for International Economics.

32. The forward rate data allow us to eliminate factors associated with the currency in which countries' assets are denominated, but they do not allow us to distinguish between two currency factors: the exchange risk premium and expectations of depreciation. For the case of Australia, for example, the support for covered interest parity suggests that barriers to the movement of capital between Sydney and New York are low, and so differences in interest rates are due to currency factors. But when the Australian interest rate is observed to exceed the U.S. interest rate, is this

Table 1: Summary Measures of Intra-regional Trade Biases

		Pacific Asia	North America	European Community
(1) Intra-regional trade / total trade	1980	.33	.32	.51
	1986	.32	.35	.57
	1989	.37	.36	.59
(2) Intra-regional bias, holding constant for size of exports	1980	2.2	1.9	1.3
	1989	1.9	1.9	1.5

		Pacific Asia	Western Hemisphere	European Community
(3) holding constant for GNP, population, distance, etc.	1980	.70	.53	.23
	1985	.40	.34	.44
	1990	.60	.97	.46

Sources:

(1) Schott (1991) and Direction of Trade, International Monetary Fund, as computed in Frankel (1991c).

(2) Computed as the ratio of (1) to shares of world trade, as described in text.

(3) Gravity regressions, reported in Tables 2, 3, and 4, respectively.

Table 2
GRAVITY MODEL OF BILATERAL TRADE: 1980

LHS Variable (Bilateral Exports & Imports) and first three RHS variables are in log form.
All others are dummy variables

C	GNPs	Per Capita GNPs	Distance	Adjacent	EEC	WH	ASEAN	EAEC	Asian Pacific	APEC	Pacific Rim	R^2 /$\bar{R}^2$	SEE
-11.356*	0.763*	0.268*	-0.597*	0.649*	0.092	0.449*	2.308*					0.68	
0.563	0.018	0.021	0.041	0.185	0.186	0.157	0.408					/0.68	1.26
-12.047*	0.759*	0.283*	-0.538*	0.775*	0.193	0.498*		2.363*				0.70	
0.552	0.017	0.020	0.041	0.180	0.181	0.153		0.212				/0.70	1.23
-12.052*	0.759*	0.283*	-0.538*	0.772*	0.193	0.499*	0.081	2.341*				0.70	
0.553	0.017	0.020	0.041	0.181	0.181	0.153	0.462	0.247				/0.70	1.23
-11.972*	0.753*	0.287*	-0.543*	0.764*	0.214	0.527*			2.066*			0.71	
0.542	0.017	0.020	0.040	0.178	0.179	0.151			0.158			/0.71	1.21
-12.128*	0.753*	0.290*	-0.532*	0.770*	0.227	0.535*	0.087	0.730-	1.650*			0.71	
0.546	0.017	0.020	0.040	0.179	0.179	0.151	0.455	0.332	0.232			/0.71	1.21
-11.09*	0.733*	0.281*	-0.586*	0.694*	0.207	0.503*				1.863*		0.71	
0.532	0.017	0.020	0.039	0.177	0.178	0.150				0.133		/0.71	1.21
-11.58*	0.739*	0.287*	-0.557*	0.724*	0.234	0.526*	0.062	0.704-	0.355	1.319*		0.71	
0.551	0.017	0.020	0.040	0.177	0.178	0.150	0.451	0.330	0.335	0.248		/0.71	1.20
-10.83*	0.762*	0.259*	-0.638*	0.701*	0.033	0.268					0.018	0.68	
0.564	0.018	0.021	0.021	0.187	0.184	0.188					0.014	/0.68	1.27
-11.55*	0.739*	0.288*	-0.563*	0.716*	0.227	0.474*	0.062	0.699-	0.350	1.321*	0.008	0.71	
0.554	0.017	0.020	0.041	0.178	0.174	0.178	0.452	0.330	0.335	0.248	0.013	/0.71	1.20

- Statistically significant at 95% level.

* Statistically significant at 99% level.

Standard errors appear below each coefficient.

Table 3
GRAVITY MODEL OF BILATERAL TRADE: 1985

LHS Variable (Bilateral Exports & Imports) and first three RHS variables are in log form.
All others are dummy variables.

C	GNPs	Per Capita GNPs	Distance	Adjacent	EEC	WH	ASEAN	EAEC	Asian Pacific	APEC	Pacific Rim	R^2 /$\bar{R}^2$	SEE
-10.54*	0.791*	0.242*	-0.729*	0.708*	0.306#	0.276#	1.735*					0.72	
0.527	0.017	0.020	0.040	0.184	0.179	0.162	0.392					/0.72	1.21
-10.92*	0.784*	0.248*	-0.683*	0.804*	0.397-	0.312-		1.841*				0.73	
0.519	0.017	0.020	0.040	0.181	0.176	0.159		0.205				/0.73	1.19
-10.92*	0.784*	0.248*	-0.683*	0.806*	0.397-	0.311-	-0.046	1.854*				0.73	
0.520	0.017	0.020	0.040	0.182	0.176	0.159	0.448	0.239				/0.73	1.19
-10.85*	0.778*	0.251*	-0.685*	0.796*	0.424-	0.341-			1.697*			0.73	
0.510	0.017	0.019	0.039	0.178	0.174	0.157			0.153			0.73	1.18
-10.91*	0.778*	0.252*	-0.679*	0.802*	0.431-	0.343-	-0.045	0.414	1.474*			0.73	
0.514	0.017	0.019	0.039	0.179	0.174	0.157	0.442	0.322	0.225			/0.73	1.18
-10.07*	0.761*	0.243*	-0.720*	0.739*	0.418*	0.323#				1.522*		0.74	
0.506	0.017	0.019	0.038	0.178	0.156	0.173				0.130		/0.74	1.17
-10.42*	0.765*	0.247*	-0.698*	0.766*	0.439#	0.339-	-0.071	0.398	0.469	1.029*		0.74	
0.524	0.017	0.019	0.039	0.179	0.173	0.156	0.440	0.321	0.327	0.244		/0.74	1.17
-10.09*	0.791*	0.239*	-0.778*	0.731*	0.239	-0.024				0.041*		0.72	
0.528	0.017	0.020	0.041	0.185	0.179	0.183				0.013		/0.72	1.20
-10.28*	0.766*	0.250*	-0.723*	0.738*	0.415-	0.142	-0.073	0.378	0.450	1.034*	0.030-	0.74	
0.527	0.017	0.019	0.040	0.179	0.173	0.177	0.439	0.320	0.327	0.244	0.013	/0.74	1.17

Statistically significant at 90% level.

- Statistically significant at 95% level.

* Statistically significant at 99% level.

Standard errors appear below each coefficient.

Table 4

GRAVITY MODEL OF BILATERAL TRADE: 1990

LHS Variable (Bilateral Exports & Imports) and first three RHS variables are in log form.

All others are dummy variables

C	GNPs	Per Capita GNPs	Distance	Adjacent	EEC	WH	ASEAN	EAEC	Asian Pacific	APEC	Pacific Rim	R^2 / $\bar{R}^2$	SEE
2.765*	0.787*	0.078*	-0.589*	0.732*	0.341~	0.934*	1.879*					0.75	
0.360	0.016	0.017	0.038	0.166	0.166	0.148	0.378					/0.75	1.11
2.535*	0.779*	0.082*	-0.559*	0.794*	0.412~	0.957*		1.997*				0.76	
0.351	0.016	0.017	0.038	0.162	0.163	0.145		0.215				/0.76	1.09
2.538*	0.779*	0.082*	-0.559*	0.797*	0.412~	0.955*	-0.109	2.032*				0.76	
0.351	0.016	0.017	0.038	0.163	0.163	0.145	0.450	0.261				/0.76	1.09
2.568*	0.773*	0.086*	-0.561*	0.790*	0.437*	0.983*			1.746*			0.77	
0.345	0.016	0.016	0.037	0.160	0.160	0.143			0.152			/0.77	1.08
2.515*	0.773*	0.087*	-0.555*	0.794*	0.446*	0.986*	-0.107	0.612#	1.456*			0.77	
0.346	0.016	0.016	0.037	0.160	0.160	0.143	0.443	0.331	0.213			/0.77	1.08
3.024*	0.756*	0.083*	-0.597*	0.730*	0.444*	0.948*				1.597*		0.77	
0.340	0.016	0.016	0.036	0.158	0.159	0.141				0.128		/0.77	1.07
2.831*	0.760*	0.085*	-0.579*	0.750*	0.460*	0.967*	-0.144	0.604#	0.289	1.194*		0.77	
0.348	0.016	0.016	0.037	0.159	0.159	0.142	0.440	0.328	0.309	0.231		/0.77	1.07
3.035*	0.788*	0.073*	-0.619*	0.780*	0.296#	0.789*					0.015	0.75	
0.365	0.017	0.017	0.040	0.167	0.167	0.170					0.013	/0.74	1.12
2.868*	0.760*	0.086*	-0.584*	0.743*	0.454*	0.925*	-0.143	0.600#	0.284	1.196*	6.39×10^{-3}	0.77	
0.380	0.016	0.016	0.038	0.160	0.159	0.163	0.440	0.328	0.309	0.231	0.012	/0.77	1.07

Table 5: Gravity Estimates with Allowance for Asian Openness

GNP	GNP/capita	Dist	Adja	WH2	EA2	APEC2	EEC	JapEA	HKSEA	HKS1	EA1	adj.R^2 / SEE	#OBS
1980													
.78**	.24**	-.64**	.62**	.58**	.51#	1.29**	.18	-.11		1.33**		.73 / 1.16	1708
.02	.02	.04	.18	.15	.34	.17	.18	.16		.12			
.73**	.31**	-.66**	.63**	.65**	.31	1.22**	.18	-.12	1.06**		.52**	.72 / 1.18	1708
.02	.02	.04	.18	.15	.34	.17	.18	.49	.41		.07		
.78**	.26**	-.67**	.59**	.64**	.53##	1.19**	.15	-.16	.01	1.16**	.25**	.73 / 1.16	1708
.02	.02	.04	.18	.15	.34	.17	.17	.48	.42	.14	.08		
1985													
.78**	.22**	-.74**	.69**	.37*	.36	1.18**	.45**	.09		.76**		.74 / 1.16	1647
.02	.02	.04	.18	.15	.26	.17	.17	.16		.12			
.76**	.26**	-.77**	.69**	.42**	.16	1.10**	.44*	-.08	.80*		.34**	.74 / 1.16	1647
.02	.02	.04	.18	.15	.34	.17	.18	.48	.40		.07		
.78**	.23**	-.77**	.67**	.41**	.26	1.09**	.44*	-.10	.28	.59**	.20*	.74 / 1.16	1647
.02	.02	.04	.18	.15	.34	.17	.18	.48	.42	.14	.08		
1990													
.80**	.04**	-.63**	.69**	.97**	.40##	1.18**	.49**	-.15		1.23**		.79 / 1.03	1573
.02	.02	.04	.18	.13	.23	.15	.16	.14		.11			
.75**	.10**	-.66**	.69**	1.06**	.14	1.11**	.49**	-.27	1.09**		.50**	.78 / 1.05	1573
.02	.02	.04	.18	.14	.30	.15	.16	.43	.37		.07		
.79**	.06**	-.67**	.65**	1.03**	.34	1.08**	.49**	-.31	.15	1.06**	.25**	.79 / 1.02	1573
.02	.02	.04	.18	.14	.30	.15	.15	.42	.38	.12	.07		

Notes:

1. **, (*), [#], {##} denote "significant at the 99%, (95%), [90%] and {85%} levels, respectively.

2. All regressions have an intercept, which is not reported here. All variables except the dummies are in logs.

3. Definitions of new dummy variables:

JapEA - trade between Japan and other East Asian countries,

HKSEA - trade between Hong Kong or Singapore and other EA countries,

HKS1 - trade between Hong Kong or Singapore and any other countries,

EA1 - trade involving at least one EA country.

Table 6: Japan's Foreign Direct Investment

Overseas Direct Investment by Area and Country

	FY 1990			FY 1991			Cumulative Total FY 1951-1991		
	Cases	Amount	% Distri.	Cases	Amount	% Distri.	Cases	Amount	% Distri.
U.S.A.	2,269	26,128	45.9	1,607	18,026	43.3	24,551	148,554	42.2
Canada	157	1,064	1.9	107	797	1.9	1,388	6,454	1.8
Subtotal (North America)	2,426	27,192	47.8	1,714	18,823	45.3	25,939	155,008	44.0
Latin America	339	3,628	6.4	290	3,337	8.0	7,487	43,821	12.4
Middle East	1	27	0.0	10	90	0.2	350	3,522	1.0
Europe	956	14,294	25.1	803	9,371	22.5	8,228	68,636	19.5
Africa	70	551	1.0	76	748	1.8	1,534	6,574	1.9
Australia and the South Pacific	572	4,166	7.3	394	3,278	7.9	4,351	21,376	6.1
Indonesia	155	1,105	1.9	148	1,193	2.9	2,021	12,733	3.6
Hong Kong	244	1,785	3.1	178	925	2.2	3,921	10,775	3.1
Singapore	139	840	1.5	103	613	1.5	2,662	7,168	2.0
Republic of Korea	54	284	0.5	48	260	0.6	1,895	4,398	1.2
China	165	349	0.6	246	579	1.4	1,105	3,402	1.0
Thailand	377	1,154	2.0	258	807	1.9	2,723	5,229	1.5
Malaysia	169	725	1.3	136	880	2.1	1,645	4,111	1.2
Taiwan	102	446	0.8	87	405	1.0	2,487	3,135	0.9
Philippines	58	258	0.5	42	203	0.5	892	1,783	0.5
India	7	30	0.1	9	14	0.0	176	210	0.1
Sri Lanka	9	4	0.0	7	4	0.0	126	102	0.0
Brunei	-	-	-.	1	0	0.0	32	109	0.0
Pakistan	3	9	0.0	2	14	0.0	60	124	0.0
Others	26	69	0.1	12	39	0.1	166	175	0.0
Subtotal (Asia)	1,499	7,054	12.4	1,277	5,936	14.3	19,911	53,455	15.2
Total	6,589	67,540	100.0	5,863	56,911	100.0	63,236	310,808	100.0

Source: Financial Statistics of Japan, 1992, Ministry of Finance, p. 95.

Table 7:

Japanese and U.S. Interest Rate Effects in Five Pacific Countries

Regressions of local interest rate against:

1) Japanese and U.S. interest rates

2) Japanese and U.S. interest rates adjusted for expectations of exchange rate changes as reflected in Currency Forecasters' Digest

3) Japanese and U.S. interest rates adjusted for forward discount

	Constant term	Tokyo effect	New York effect	R^2	D.W.
Singapore 1)	-2.29*** (0.84)	0.82*** (0.07)	0.43*** (0.09)	.85	0.53
2)	3.30*** (0.39)	-0.01 (0.03)	0.27*** (0.05)	.71	0.43
3)	1.47*** (0.45)	0.29*** (0.05)	0.41*** (0.06)	.72	1.41
Australia 1)	-6.66*** (2.32)	0.74*** (0.18)	2.11*** (0.26)	.73	0.19
2)	13.90*** (1.40)	0.10* (0.06)	-0.07 (0.12)	.03	0.20
3)	3.83*** (1.13)	0.07 (0.21)	0.67*** (0.20)	.76	1.36
Taiwan 1)	-4.93 (4.04)	1.91*** (0.32)	0.32 (0.45)	.53	1.17
2)	7.14 (0.67)	0.07 (0.08)	0.10 (0.12)	.05	0.82
Korea 1)	-4.08* (2.33)	1.29*** (0.19)	1.16*** (0.26)	.69	0.78
2)	11.65*** (0.32)	0.04 (0.04)	0.27*** (0.07)	.55	1.28
Hong Kong 1)	-6.40*** (1.51)	0.25* (0.15)	1.66*** (0.17)	.79	0.59

* Statistically different from zero at 90 % significance level.

*** Statistically different from zero at 99 % significance level.

(Standard errors are reported in parentheses.)

TABLE 8

Trends in the Influence of Dollar vs. Yen Interest Rates

1982:09-92:03

	Constant	Euro-dollar	Euro-dollar Trend	Euro-yen	Euro-yen Trend	R^2	DW	Q
Aus.	8.473*	-1.992**	0.429**	3.470**	-0.539**	.52	0.409	141.47**
	(1.143)	(0.277)	(0.041)	(0.411)	(0.054)			
	[3.428]	[0.479]	[0.071]	[0.712]	[0.094]			
Can.	0.535	0.487*	0.086**	0.670*	-0.057	.79	0.477	158.12**
	(0.458)	(0.111)	(0.016)	(0.165)	(0.022)			
	[1.375]	[0.192]	[0.028]	[0.285]	[0.038]			
Hong Kong	-4.115	1.691**	-0.068	-0.353	0.104	.71	1.047	41.35**
	(0.857)	(0.208)	(0.031)	(0.308)	(0.041)			
	[2.570]	[0.360]	[0.053]	[0.533]	[0.071]			
Indo-nesia	14.010**	1.852**	-0.267**	-2.337*	0.410**	.33	0.700	na
	(1.483)	(0.356)	(0.053)	(0.529)	(0.070)			
	[4.449]	[0.616]	[0.091]	[0.916]	[0.121]			
Korea 1	9.094**	-0.037	-0.031*	-0.103	0.002	.82	0.488	124.18**
	(0.194)	(0.039)	(0.009)	(0.065)	(0.011)			
	[0.581]	[0.067]	[0.015]	[0.113]	[0.019]			
Korea 2	16.294**	-0.754	0.097	-0.929	0.086	.64	0.671	57.01**
	(1.087)	(0.527)	(0.077)	(0.704)	(0.091)			
	[3.262]	[0.913]	[0.133]	[1.219]	[0.158]			
Korea 3	10.079**	0.320	-0.061	-0.019	0.124*	.69	0.204	194.35**
	(0.690)	(0.143)	(0.026)	(0.231)	(0.031)			
	[2.070]	[0.248]	[0.045]	[0.400]	[0.053]			

Table 8, continued

	Constant	Euro-dollar	Euro-dollar Trend	Euro-yen	Euro-yen Trend	R^2	$\bar{R}$ DW	Q
Mal-	5.520	-0.057	-0.072	0.700	0.016	.41	0.463	na
aysia	(1.262)	(0.286)	(0.049)	(0.453)	(0.059)			
	[3.785]	[0.496]	[0.086]	[0.784]	[0.102]			
New	18.573**	-2.584**	0.379**	3.405**	-0.599**	.37	0.327	204.22**
Zld.	(2.063)	(0.500)	(0.074)	(0.742)	(0.098)			
	[6.291]	[0.866]	[0.129]	[1.285]	[0.169]			
Sing-	-2.768*	0.960**	-0.052*	0.174	0.056	.86	0.842	103.64**
apore	(0.413)	(0.093)	(0.014)	(0.142)	(0.019)			
	[1.239]	[0.161]	[0.025]	[0.246]	[0.032]			
Tai-	-4.144	0.635	0.017	0.811	0.049	.45	0.422	109.01**
wan	(1.217)	(0.292)	(0.043)	(0.437)	(0.057)			
	[3.651]	[0.505]	[0.075]	[0.757]	[0.099]			
Thai-	-3.846	0.780	-0.069	1.363*	0.097	.78	0.461	na
land	(1.114)	(0.232)	(0.039)	(0.363)	(0.049)			
	[3.341]	[0.402]	[0.068]	[0.628]	[0.085]			

Notes: Figures in parentheses (.) are asymptotic standard errors.

Figures in brackets [.] are standard errors assuming N/3 independent observations.

Q-statistic indicates the Ljung-Box Q-statistic.

* (**) indicates significance at the 5 (1)% using the adjusted standard errors.

Table 9a

WEIGHTS ASSIGNED TO FOREIGN CURRENCIES IN DETERMINING CHANGES IN VALUE OF MALAYSIAN RINGGIT

	Constant	Yen	Dollar	Mark	Pound	Franc	R2	D.W.
74.1-91.10	-.0028	.01	.16	.07	.01	-.01	.28	1.59
	-7.97***	0.55	6.74***	2.35***	0.33	-0.22		
74.1-76.12	-.0044	.05	.15	.09	-.06	-.01	.24	1.59
	-2.74***	0.37	1.29	0.90	-0.69	-0.17		
77.1-79.12	-.0017	.05	.29	.15	.04	-.07	.45	1.73
	-1.82*	1.27	3.38**	2.19**	0.76	-0.78		
80.1-82.12	-.0041	.00	.11	.15	.03	-.06	.35	1.52
	-4.14***	0.08	2.17**	2.13**	0.83	-0.88		
83.1-85.12	-.0014	.07	.17	-.07	.00	.12	.32	1.90
	-1.55	1.24	2.65***	-0.59	0.00	0.98		
86.1-88.12	-.0021	-.04	.12	.06	-.06	-.02	.44	1.49
	-3.78***	-1.45	2.86***	0.70	2.55***	-0.24		
88.1-90.12	-.0025	-.01	.17	-.10	.04	.09	.30	1.55
	-5.52***	-0.50	2.75***	-0.76	1.56	0.71		

* (**) [***] Statistically significant at 90% (95%) [99%] level.

t-statistics reported below coefficients.

Note: The value of currencies, both domestic and foreign, here refer to purchasing power over Malaysian goods, as measured by the CPI.

Table 9b

WEIGHTS ASSIGNED TO FOREIGN CURRENCIES IN DETERMINING CHANGES IN VALUE OF THAI BAHT

	Constant	Yen	Dollar	Mark	Pound	Franc	R^2	D.W.
1974.1-91.3	-.0039 8.05***	.01 0.61	.30 9.37***	-.01 -0.03	-.02 -0.63	.03 0.85	.38	1.43
74.1-76.12	-.0000 -0.90	-.00 -0.00	1.00 240.71***	.00 .42	-.00 -.36	-.00 -.10	1.00	2.05
77.1-79.12	-.0010 -2.35**	.03 2.69***	.89 22.16***	.02 1.10	-.00 -0.01	-.05 -1.72*	.96	1.70
80.1-82.12	-.0061 -3.71***	.01 0.15	.47 5.82***	.11 0.96	.00 0.04	-.10 -0.80	.58	1.47
83.1-85.12	-.0020 -2.45**	.01 0.29	.03 0.91	-.01 -0.06	-.07 -2.04**	.09 0.89	.32	1.51
86.1-88.12	-.0006 -1.72*	.06 3.52***	.63 10.02***	-.03 -0.69	.05 3.29***	.08 1.76*	.80	2.04
88.1-90.12	.0001 0.61	.13 19.35***	.82 45.42***	.06 1.99**	.02 2.72***	-.01 -0.22	.99	1.77

* (**) [***] Statistically significant at 90% (95%) [99%] level.

t-statistics reported below coefficients.

Note: The value of currencies, both domestic and foreign, here refer to purchasing power over Thai goods, as measured by the CPI.

Table 9c
WEIGHTS ASSIGNED TO FOREIGN CURRENCIES IN DETERMINING CHANGES IN VALUE OF SINGAPORE DOLLAR

	Constant	Yen	Dollar	Mark	Pound	Franc	R^2	D.W.
74.1-91.13	-.0015	.06	.24	.13	-.01	-.04	.45	1.55
	-3.96***	3.93***	9.68***	4.19**	-0.58	-1.26		
74.1-76.12	-.0025	.02	.24	.26	-.07	-.00	.46	1.40
	-1.74*	0.20	2.32**	2.84***	-0.97	-0.05		
77.1-79.12	-.0010	.09	.47	.25	.09	-.09	.83	1.90
	-1.32	3.53***	8.07***	4.820***	2.32**	-1.44		
80.1-82.12	-.0013	.11	.22	.22	.07	-.12	.74	1.42
	-1.50	3.72***	4.73***	3.82***	2.05**	-2.04**		
83.1-85.12	-.0012	.20	.19	-.08	-.02	.07	.41	1.55
	-1.70*	3.87***	3.09***	-0.78	-0.53	0.77		
86.1-88.12	-.0004	.01	.14	.02	.02	.01	.46	2.59
	-0.83	0.36	3.93***	0.33**	1.14	0.12		
88.1-90.12	-.0010	.02	.15	-.05	.04	.06	.32	2.31
	-1.65*	0.87	3.29***	-0.42	1.29	0.46		

* (**) [***] Statistically significant at 90% (95%) [99%] level.

t-statistics reported below coefficients.

Note: The value of currencies, both domestic and foreign, here refer to purchasing power over Singpore goods, as measured by the CPI.

Table 10
Share of the Yen in Debt-Denomination and Official Reserve Holdings

In per cent

	Yen share in external debt of five countries						Yen share in official holdings	
	Indo-nesia	Korea	Mal-aysia	Phil.	Thai-land	Total of 5	Asia*	World
1980	20.0	16.6	19.0	22.0	25.5	19.5	13.9	4.4
1981	19.3	14.1	16.9	20.6	23.2	17.8	15.5	4.2
1982	21.0	12.3	13.3	19.2	24.0	17.2	17.6	4.7
1983	23.3	12.5	14.2	20.0	27.3	18.5	15.5	5.0
1984	25.0	12.8	21.2	20.0	29.2	20.3	16.3	5.8
1985	31.7	16.7	26.4	24.9	36.1	25.8	26.9	8.0
1986	33.9	22.0	30.4	25.5	39.9	29.3	22.9	7.9
1987	39.4	27.2	35.7	35.2	43.1	36.0	30.0	7.5
1988	39.3	29.5	37.1	40.5	43.5	37.9	26.7	7.7
1989	35.2	26.6	36.6	32.6	40.9	35.7	17.5	7.9
1990							17.1	9.1

*Selected Asian countries (not including Japan).

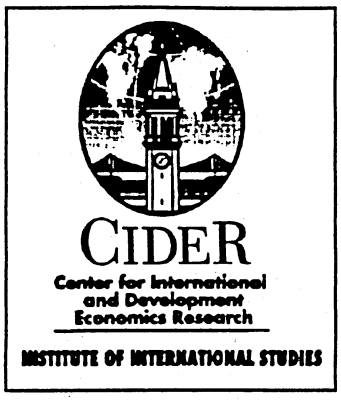
Source: Tavlas and Ozeki (1992, p.39).

Table 11
Share of the Yen in Denomination of Foreign Trade

In per cent

	Denomination of exports		Denomination of imports	
	Southeast Asia	All regions	Southeast Asia	All regions
1983	48.0	40.4	2.0	3.0
1986	37.5	35.5	9.2	9.7
1987	36.3	34.7	13.9	11.6
1988	41.2	34.3	17.5	13.3
1989	43.5	34.7	19.5	14.1
1990	48.9	37.5	19.4	14.4

Source: Japanese Ministry of Finance, Annual Report, as reported in Tavlas and Ozeki (1992, p.33).



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