Volume Title: Macroeconomic Linkage: Savings, Exchange Rates, and Capital Flows, NBER-EASE Volume 3

Volume Author/Editor: Takatoshi Ito and Anne Krueger, editors

Volume Publisher: University of Chicago Press

Volume ISBN: 0-226-38669-4

Volume URL: http://www.nber.org/books/ito_94-1

Conference Date: June 17-19, 1992

Publication Date: January 1994

Chapter Title: Yen Bloc or Dollar Bloc? Exchange Rate Policies of the East Asian Economies

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Chapter URL: http://www.nber.org/chapters/c8537

Chapter pages in book: (p. 295 - 333)

12 Yen Bloc or Dollar Bloc? Exchange Rate Policies of the East Asian Economies

Jeffrey A. Frankel and Shang-Jin Wei

12.1 Introduction

One hears increasingly of a yen bloc forming in East Asia, of a switch on the part of the countries in this region in economic allegiance from the United States to Japan. This bloc is said to be forming in parallel with, and perhaps in response to, the formation of blocs in the Western Hemisphere and Europe.

In the case of Europe, the policy elements of a likely bloc are self-evident. The European Community agreed in the 1980s to strengthen its economic integration, most notably with the Single Market Act of 1985 and the other initiatives associated with the year 1992. Leading the way have been attempts to stabilize the values of the European currencies vis-à-vis each other—beginning with the Snake of the 1970s and followed by the more successful European Monetary System founded in 1979—and the more ambitious plans for European Monetary Union agreed upon at Maastricht in December 1991. In the case of the Western Hemisphere, the policy elements are almost as self-evident. On the trade front they consist most notably of the Canadian–U.S. Free Trade Area, followed by the addition of Mexico to a North American Free Trade Area currently under negotiation and future plans for other Latin American countries to join in. Integration on the currency front is not as strong a trend in the Western Hemisphere as in Europe. But most Latin American countries remained pegged to the dollar in the mid-1970s (following it in the

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The authors thank Warwick McKibbin for data, Koichi Hamada, Takatoshi Ito, Sung-Hee Jwa, Masahiro Kawai, Anne Krueger, and Alan Winters for useful comments, and Benjamin Chui for research assistance. They also thank the Center for International and Development Economics Research (funded at U.C. Berkeley by the Ford Foundation) and the Japan–United States Friendship Commission (an agency of the U.S. government) for research support.

devaluations of 1971 and 1973, for example). Fifteen years later, having first lost their monetary virginity and then having fought their way back most of the way to price stability, a few Latin American countries are considering whether to repeg their currencies to the dollar.[1] Argentina has already done so.

In East Asia, explicit policy initiatives are missing. The phrase "yen bloc" connotes to some a concentration of trade and direct investment relations on the part of East Asian countries, to others a heightened role in the region for the Japanese currency. These two possible interpretations of "yen bloc" are not necessarily in competition, because one could be a contributing cause of the other.

Not only have currency links and bilateral trade links been less often the subject of policy initiatives in East Asia than in other regions, but they have also been less extensively studied. We consider in this paper three possible components of a yen bloc hypothesis: (1) The role of the yen is increasing over time in the exchange rate policies of the East Asian economies. Actions are taken by the countries in the region to stabilize bilateral exchange rates vis-à-vis Japan (and thereby vis-à-vis each other). (2) A regional trading bloc centered on Japan is emerging. Trade between Japan and other East Asian economies has been increasing more rapidly than what would be predicted based on such factors as bilateral GNPs and transportation costs. (3) Stabilization of exchange rates vis-à-vis the yen, item 1 above, is one of the causes of increased intraregional trade, item 2.[2]

This paper examines relevant statistics on all three aspects of a de facto yen bloc. Even if these hypotheses clearly held, there would still be a fourth question to consider: To what extent is the increased role of the yen orchestrated by the Japanese government, or deliberately enhanced by other governments in the region? Throughout, we will concurrently investigate an alternative hypothesis, that East Asia remains part of a U.S. dollar bloc. Our conclusions, to anticipate, are that the yen bloc hypothesis and its constituent propositions stated above do not hold up as empirical characterizations of the 1980s. Rather, East Asia remains more closely affiliated with the dollar bloc.

12.2 The Yen versus the Dollar in East Asia

The theory of optimum currency areas suggests that relatively small trade-oriented countries might want to stabilize the foreign exchange value of their currencies. In the case of the East Asian countries, though they tend to be trade-oriented, it is not clear *which* major foreign currency should be the one to link to.

1. Dornbusch (1992) has suggested that Mexico might repeg its peso. Mancera (1991), however, thinks this unlikely.

2. This paper thus extends the results on bilateral trade in Frankel (1992a) by focusing on the role of links between East Asian currencies and the yen and dollar.

12.2.1 Weights in the Exchange Rate Baskets of East Asian Currencies

We begin by examining the relative importance of the Japanese yen and U.S. dollar in the exchange rate policies of nine East Asian developing countries. We will argue that in the sphere of exchange rate policies, the evidence of an increasing role of the yen is relatively faint, and the U.S. dollar continues to dwarf all other currencies.

Only a few Asian currencies are pegged to the dollar, and none is to the yen.[3] Many are officially or de facto linked to a basket of major currencies. Typically, the weights assigned to various currencies are not announced, but the U.S. dollar and Japanese yen are clearly on the list of candidates. One possible piece of evidence for the formation of a yen bloc in East Asia would be an increasing weight assigned to the yen in these countries' baskets. Since the weights are generally secret, it is particularly important to infer policies by observing actual behavior, rather than relying on official pronouncements.[4] We estimate the implicit weights econometrically.

We use weekly data (Friday close of the London market, from Data Resource Inc.) from the beginning of 1979 to the second week of May of 1992. The test is a regression of the changes in the value of the domestic currency against the changes in the values of foreign currencies.

In the case of a perfect basket peg, ordinary least squares (OLS) regression will uncover the correct weights regardless of the choice of numeraire used to measure "the values" of currencies (assuming only that the list of currencies used to try to explain the exchange rate includes all relevant candidates). When the currency is not perfectly pegged to any basket, the choice of numeraire affects the interpretation of the error term. Frankel (1992a) chooses the inverse of domestic CPI as the numeraire, so as to interpret changes in the values of currencies as the changes in the purchasing power of the currency in question. The CPI data are only available on a monthly basis. We choose here to express the values of all currencies in terms of the Swiss franc. We use the bilateral exchange rate data in our regressions because we want to take advantage of weekly data. (We have tried the same tests using the special drawing right [SDR] as the numeraire, for several of the countries, including Korea, and find very similar results. These results are not reported here.)

3. Reisen and Trotsenburg (1988) discuss the pros and cons of the Four Dragons pegging to the yen. Park and Park (1991) emphasize the problems that fluctuations in the yen/dollar rate create for these four countries. Kwan (1992) argues that the Four, who compete with Japan in third markets, are relatively better candidates to peg to the yen, while the ASEAN countries, who import manufactures from Japan and export commodities, are relatively worse candidates to peg to the yen.

4. Indeed, many countries that claim to follow a basket peg do not in fact do so. For a possible explanation of why countries keep the weights secret, see Lowell (1992) and Takagi (1988). The basic idea is that secret weights allow the governments to devalue their currencies secretly when they so desire. But secret weights undermine the governments' ability to commit credibly to a low-inflation monetary policy.

Two kinds of regressions are reported here for each currency and each sample period. The first one uses the U.S. dollar and Japanese yen as the only regressors (plus a constant to pick up any trend appreciation or depreciation). The second also includes the deutschemark (DM), Australian dollar, and New Zealand dollar in the list. Other European currencies are not used, in part because they are highly correlated with the movement of the DM.

The main findings are as follows: (1) All nine currencies assign heavy weight to the U.S. dollar during each two-year period in the sample. (2) Only one East Asian currency, the Singapore dollar, has throughout the period assigned weight to the yen in addition to the dollar. (3) Several currencies gave a bit of increased weight to the yen during the period 1981–84, when the dollar was strongly appreciating (the Singapore dollar), in 1985–86, as the dollar hit its peak and began to depreciate (the Hong Kong dollar, Indonesian rupiah, Thai baht), or in 1987–88, after the dollar had completed most of its depreciation (the New Taiwan [NT] dollar). (4) The only currencies to place a significant weight on the yen in the most recent subperiod (1991–92), besides the Singapore dollar, are the Malaysian ringgit and the Thai baht.

In summary, the observed role of the yen in the mid-1980s is likely to have been the result of a temporary overvaluation of the U.S. dollar. As far as exchange rate policies are concerned, a more permanent role for the yen is yet to be seen.

We now turn to details of exchange rate targeting for individual currencies. Detailed regression results are reported in tables 12.1–12.9.

Korean Won

The Korean won has been linked more or less solely to the U.S. dollar according to these estimates. The average weight assigned to the dollar in the entire 1979–92 sample is about 0.96.

In the 1979–80 period, the won had an implicit weight of 0.93 on the dollar. The dollar weight was even higher in the 1981–88 period, even though Korea supposedly abandoned its official dollar peg in January 1980 in favor of a basket. No positive weight is found assigned to the Japanese yen in these estimates (except for some faint signs in the 1981–82 and 1987–88 periods), nor to the DM or other currencies. Throughout the sample, the won systematically and statistically significantly depreciated against the numeraire currency (the Swiss franc) for every two-year period, except for the brief period of 1987–88, when the won appreciated.

In the most recent subperiods, 1989–90 and from 1991 to the second week of May of 1992, the weight on the dollar is statistically not different from one (and the adjusted R^2 is about 0.98 in both periods). This finding is particularly interesting in light of the "market average rate" (MAR) system of setting the exchange rate of the won adopted by the Korean authorities. The MAR system was instituted in March 1990, in response to American political pressure, and supposedly allows a greater role for the market in determining the won/dollar

Table 12.1 **Weights Assigned to Foreign Currencies in Determining Changes in Value of Korean Won (January 1, 1979–May 8, 1992)**

Years	Constant	Dollar	Yen	DM	Aus$	NZ$	R^2/D-W	Chow/White
1979–80	−.0030##	.93**	−.10				.31/2.03	.79/1.52
	.0017	.14	.13					
	−.0030	.87*	−.11	−.23	.11	.02	.30/2.02	.74/6.18
	.0018	.35	.13	.37	.41	.29		
1981–82	−.0012**	.98**	.04				.96/2.24	.49/3.00
	.0004	.02	.03					
	−.0012**	1.03**	.06#	.07	−.11	.00	.96/2.19	1.21/6.33
	.0004	.07	.04	.05	.10	.02		
1983–84	−.0008*	.94**	−.00				.94/2.34	1.54/1.03
	.0003	.03	.05					
	−.0008*	.93**	−.00	.01	.00	.00	.93/2.35	.75/12.06
	.0003	.03	.05	.06	.02	.02		
1985–86	−.0007**	.94**	.01				.99/1.45	11.51**/7.24
	.0002	.01	.02					
	−.0007**	.95**	.01	−.01	−.00	−.01	.99/1.45	5.72**/18.12
	.0002	.02	.02	.04	.01	.01		
1987–88	.0021**	.94**	.05##				.98/.97	8.21/7.25
	.0002	.02	.03					
	.0020**	.90**	.02	.04	.05**	−.01	.98/.93	3.36**/14.96
	.0002	.02	.03	.07	.02	.01		
1989–90	−.0004*	1.00**	.01				.98/1.38	3.70/2.81
	.0002	.02	.02					
	−.0005*	1.01**	.00	.03	−.01	−.01	.98/1.39	2.30*/16.67
	.0002	.02	.02	.04	.02	.02		
1991–92	−.0010**	1.03**	−.10*				.98/2.26	1.55/6.43
	.0004	.03	.04					
	−.0009*	.98**	−.10*	−.09##	−.01	.07##	.98/2.24	.84/30.43
	.0004	.05	.04	.06	.03	.05		
1979–92	−.0007*	.96**	−.01				.82/1.94	4.65**/1.76
	.0003	.02	.03					
	−.0007*	.95**	−.01	−.00	.01	.01	.82/1.94	2.29*/4.02
	.0003	.03	.03	.05	.02	.02		

Notes: "R^2" refers to "R^2 adjusted for degrees of freedom." Numbers reported below coefficients are standard errors. All currencies are in terms of units of Swiss francs.

**Statistically significant at the 99 percent level.

*Statistically significant at the 95 percent level.

#Statistically significant at the 90 percent level.

##Statistically significant at the 85 percent level.

rate.[5] But the absence of any fall in the R^2 or dollar coefficient in these estimates suggests that the won is as closely pegged to the dollar as it ever was. We consider the case of the won in detail in the last section of this paper,

5. Monthly estimates of the determination of the won in Frankel (1992b) assign a significant weight to the yen during the period April 1988–March 1990 when currency values are measured in terms of purchasing power, but not when they are measured in terms of the SDR.

Table 12.2 **Weights Assigned to Foreign Currencies in Determining Changes in Value of Singapore Dollar (January 1, 1979–May 8, 1992)**

Years	Constant	Dollar	Yen	DM	Aus$	NZ$	R^2/D-W	Chow/White
1979–80	.0005	.80**	.09*				.82/2.37	.32/3.35
	.0006	.05	.04					
	.0005	.19*	.05##	.21*	.45**	.20**	.89/2.50	4.50**/36.30*
	.0004	.09	.03	.09	.10	.07		
1981–82	.0002	.73**	.18**				.89/2.32	.97/3.19
	.0005	.03	.04					
	.0006	.51**	.10*	.05	.31*	−.00	.90/2.30	2.19/50.16**
	.0005	.09	.05	.08	.14	.03		
1983–84	.0000	.75**	.18**				.91/2.00	3.17*/4.13
	.0003	.03	.05					
	.0001	.73**	.17**	.00	.03	.01	.91/1.99	2.06/12.60
	.0003	.03	.05	.06	.03	.02		
1985–86	−.0015*	.66**	.09				.80/2.28	8.15**/33.99**
	.0007	.05	.07					
	−.0016*	.62**	.10##	.17	.00	.02	.79/2.28	4.66**/43.49**
	.0008	.06	.07	.14	.03	.03		
1987–88	.0008**	.78**	.08#				.94/2.08	.97/9.62
	.0003	.02	.04					
	.0008*	.76**	.08#	.14	−.01	.02	.94/2.03	.70/18.97
	.0003	.03	.04	.10	.03	.02		
1989–90	.0013**	.80**	.17**				.89/2.42	.39/6.22
	.0004	.03	.03					
	.0011**	.86**	.15**	.12##	−.06##	−.04	.90/2.31	.94/28.43
	.0004	.05	.03	.07	.04	.05		
1991–92	.0008	.74**	.15				.81/2.26	2.21/.77
	.0009	.07	.11					
	.0005	.72**	.16##	.31*	−.08	.08	.82/2.36	1.54/14.09
	.0009	.12	.11	.15	.08	.11		
1979–92	.0003##	.75**	.13**				.86/2.28	.55/46.80**
	.0002	.01	.02					
	.0003##	.71**	.12**	.14**	.01	.02##	.86/2.28	1.97/87.20**
	.0002	.02	.02	.04	.02	.01		

Notes: "R^2" refers to "R^2 adjusted for degrees of freedom." Numbers reported below coefficients are standard errors. All currencies are in terms of units of Swiss francs.

**Statistically significant at the 99 percent level.

*Statistically significant at the 95 percent level.

#Statistically significant at the 90 percent level.

##Statistically significant at the 85 percent level.

in light of the special role played by Korea's political relationship with the United States.

Singapore Dollar

The Singapore dollar is the only currency among the nine examined here that assigns weights to both the yen and dollar during the entire sample period (1979–92).

At the beginning of the 1980s, the Singapore dollar moved with a basket of at least five currencies: U.S. dollar, yen, DM, Australian dollar, and New Zealand dollar, with estimated weights of .19, .05, .21, .45, and .20.[6] The weight on the yen was among the lowest, a mere 5 percent, and only marginally significant at the 85 percent level. The Australian dollar had the highest apparent weight (45 percent), but it may be picking up some of the weight that should properly be assigned to the U.S. dollar.

In the early 1980s, the weight on the yen doubled, the weight on the dollar fell slightly, and the weights on other currencies fell sharply. For example, during the 1983–84 period the weights on the U.S. dollar and yen are statistically significant (0.73 and 0.18, respectively), while weights on all the other currencies are statistically not different from zero (these are similar to the results in Frankel [1992a]).

Relative to the numeraire currency, the Singapore dollar depreciated by about 0.15 percent during 1985–86, after controlling for the movement of the U.S. dollar and other currencies relative to the numeraire. But the Singapore dollar appreciated during the subsequent 1987–90 period to more than offset the earlier depreciation.

Hong Kong Dollar

The Hong Kong dollar gives very heavy weight to the U.S. dollar. In the early 1980s the peg was nevertheless somewhat loose. During the period 1987–92, the U.S. dollar peg is close to perfect: a coefficient and R^2 virtually equal to 1.0 and a constant term of zero. The only subperiod when significant weight is granted the yen is 1985–86, when Hong Kong appeared to experiment with a peg to a basket of the two major currencies, presumably to avoid overvaluation from pegging solely to the U.S. dollar during a period when the American currency was very strong.

New Taiwan Dollar

The NT dollar was apparently rigidly pegged to the U.S. dollar with very narrow margin before 1981. The point estimate of the dollar weight during 1979–80 was one, and the R^2 was 1.0. The fluctuation margin widened after 1981. The dollar weight was not statistically different from one during the 1983–84 and 1985–86 periods (and R^2s were above .97), though the value of the NT dollar could deviate somewhat more from that of the U.S. dollar at any given point in time. Prior to 1986, the U.S. dollar was clearly the only currency to which the NT dollar was pegged.

During 1987–88, the yen did receive significant weight (an estimated 13 percent). Why did the yen weight suddenly rise? Since 1986 the U.S. Treasury had been applying pressure to Taiwan and the other newly industrialized countries (NICs) to allow their currencies to appreciate against the dollar; the Amer-

6. The weights do not necessarily add up to one because no such constraint is imposed in the regressions.

Table 12.3 **Weights Assigned to Foreign Currencies in Determining Changes in Value of Hong Kong Dollar (January 1, 1979–May 8, 1992)**

Years	Constant	Dollar	Yen	DM	Aus$	NZ$	R^2/D-W	Chow/White
1979–80	−.0006	.90**	−.01				.71/2.00	1.04/4.10
	.0008	.06	.06					
	.0008	.37**	−.04	.09	.64**	−.04	.71/2.00	1.04/4.10
	.0008	.15	.05	.15	.17	.12		
1981–82	−.0020##	.77**	−.03				.50/2.30	.60/6.14
	.0014	.09	.11					
	−.0016	.59*	−.09	.03	.20	.05	.49/2.26	3.11**/26.47
	.0015	.26	.14	.21	.38	.09		
1983–84	−.0014	.91**	−.13				.39/1.79	1.55/2.59
	.0014	.13	.22					
	−.0013	.92**	−.12	.06	−.05	.02	.37/1.80	.97/12.32
	.0015	.15	.23	.24	.11	.07		
1985–86	−.0002	.95**	.06**				.99/2.78	3.39*/69.39**
	.0002	.01	.02					
	−.0001	.96**	.06**	−.01	.00	−.01	.99/2.77	2.22*/74.76**
	.0002	.02	.02	.04	.01	.01		
1987–88	.0000	.98**	.01				1.00/2.25	.14/.78
	.0000	.01	.01					
−.0000	.98**	.01	−.02	.00	.00.	00	1.00/2.24	.18/4.88
	.0000	.01	.01	.03	.01	.01		
1989–90	−.0000	.99**	.00				.99/2.04	.88/1.55
	.0001	.01	.01					
	−.0000	.99**	.01	−.01	.016#	−.01	.99/2.09	.50/6.10
	.0001	.01	.01	.02	.009	.01		
1991–92	.0000	1.01**	−.01				.99/2.49	.31/2.71
	.0002	.02	.02					
	.0001	1.00**	.01	.01	.02	.04	.99/2.50	1.06/8.31
	.0002	.03	.02	.03	.02	.03		
1979–92	−.0007*	.92**	−.00				.76/2.04	6.37**/3.26
	.0003	.02	.03					
	−.0007*	.89**	−.01	.02	.01	.02	.76/2.03	3.22**/9.51
	.0003	.03	.03	.06	.03	.02		

Notes: "R^2" refers to "R^2 adjusted for degrees of freedom." Numbers reported below coefficients are standard errors. All currencies are in terms of units of Swiss francs.

**Statistically significant at the 99 percent level.

*Statistically significant at the 95 percent level.

#Statistically significant at the 90 percent level.

##Statistically significant at the 85 percent level.

ican government was disappointed that its trade balance had not yet responded to the 1985–86 Plaza-induced depreciation of the dollar against the yen and European currencies and thought that part of the explanation might lie in the choice of the NICs and other countries to follow the dollar down. Taiwan, with a visible stockpiling of international reserves that was close to a world record, was a particular target. The Taiwanese apparently responded to the pressure to

Table 12.4 **Weights Assigned to Foreign Currencies in Determining Changes in Value of Taiwan Dollar (January 1, 1979–May 8, 1992)**

Years	Constant	Dollar	Yen	DM	Aus$	NZ$	R^2/D-W	Chow/White
1979–80	.0000	1.00**	.00				1.00/2.83	.25/103.0*
	.0000	.00	.00					
	.0000	1.00**	.00	.00	.00	.00	1.00/2.83	.35/103.0**
	.0000	.00	.00	.00	.00	.00		
1981–82	−.0008	.94**	.04				.82/1.92	.44/9.89
	.0008	.05	.07					
	−.0004	.74**	−.03	−.01	.29	.01	.82/1.93	.39/17.45
	.0008	.15	.09	.12	.23	.05		
1983–84	.0000	1.01**	−.01				.97/1.62	1.52/3.19
	.0002	.02	.04					
	.0000	1.01**	−.01	.02	−.00	.00	.97/1.63	.95/7.28
	.0002	.02	.04	.04	.02	.01		
1985–86	.0009**	.99**	.01				.98/1.14	8.57**/2.95
	.0003	.02	.02					
	.0009**	.99**	.02	.04	.00	−.01	.98/1.17	4.89**/12.17
	.0003	.02	.03	.05	.01	.01		
1987–88	.0020**	.94**	.13*				.92/.85	10.36**/5.79
	.0004	.03	.06					
	.0020**	.97**	.13*	−.19	−.01	.01	.92/.86	5.06**/20.12
	.0004	.04	.06	.15	.04	.03		
1989–90	.0006	.99**	.09				.65/2.41	3.15*/7.04
	.0011	.08	.08					
	.0006	.83**	.05	.06	.01	.18	.65/2.45	1.33/25.77
	.0011	.12	.08	.19	.10	.13		
1991–92	.0011*	.94**	.08				.94/1.93	.63/3.19
	.0005	.04	.07					
	.0009#	.94**	.10##	.15#	−.09*	.08	.95/1.92	1.02/51.47**
	.0005	.07	.06	.09	.05	.07		
1979–92	.0005*	.96**	.05*				.88/2.07	5.03**/2.96
	.0002	.02	.02					
	.0005*	.94**	.04*	.05	.01	.01	.88/2.07	2.55*/16.37
	.0002	.02	.02	.04	.02	.01		

Notes: "R^2" refers to "R^2 adjusted for degrees of freedom." Numbers reported below coefficients are standard errors. All currencies are in terms of units of Swiss francs.

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##Statistically significant at the 85 percent level.

appreciate their currency by putting some weight in their basket on the appreciating yen, as well as by appreciating steadily against the basket overall.

Malaysian Ringgit

At the beginning of the 1980s, Malaysia had a diversified basket for the ringgit. The yen was clearly included in this basket during 1981–82. The large weight on the dollar fluctuates during the eighties, between .64 and .90. The

Table 12.5 **Weights Assigned to Foreign Currencies in Determining Changes in Value of Malaysian Ringgit (January 1, 1979–May 8, 1992)**

Years	Constant	Dollar	Yen	DM	Aus$	NZ$	R^2/D-W	Chow/White
1979–80	.0001	.87**	.07##				.80/2.02	.38/2.95
	.0006	.05	.05					
	.0001	.11	.02	.23*	.64**	.18*	.88/2.00	3.90**/57.07**
	.0005	.09	.04	.10	.11	.08		
1981–82	−.0002	.75**	.15**				.90/1.95	.20/.99
	.0005	.03	.04					
	−.0000	.65**	.11*	.08	.12	.01	.90/1.92	1.99/16.29
	.0005	.09	.05	.07	.14	.03		
1983–84	.0008	.64**	−.16				.25/2.44	6.68**/10.43
	.0012	.12	.21					
	.0009	.64**	−.18	−.12	−.55	.02	.23/2.43	3.59**/24.63
	.0014	.14	.21	.23	.11	.06		
1985–86	−.0017**	.76**	−.04#				.86/2.04	2.09/6.17
	.0006	.04	.06					
	−.0020**	.77**	−.04#	−.20	−.06	.02	.86/1.96	.86*/33.03*
	.0006	.05	.06	.12	.03*	.03		
1987–88	−.0008*	.74**	.11*				.90/1.92	.43/2.44
	.0004	.03	.05					
	−.0008*	.71**	.06	−.16	.08*	−.01	.90/1.95	.37/7.17
	.0004	.04	.06	.13	.03	.02		
1989–90	−.0000	.90**	.07**				.96/1.84	.77/.84
	.0003	.02	.02					
	−.0001	.88**	.04*	.09#	−.02	.04	.96/1.86	.76/17.90
	.0003	.03	.02	.05	.02	.03		
1991–92	.0012*	.80**	.14*				.94/1.45	6.29**/6.18
	.0005	.04	.06					
	.0010*	.77**	.14*	.16#	−.02	.04	.94/1.41	3.40/20.34
	.0005	.07	.06	.09	.05	.07		
1979–92	−.0003	.78**	.07**				.79/2.19	2.70*/2.29
	.0003	.02	.02					
	−.0002	.73**	.06*	.12*	.01	.03##	.79/2.19	1.87/4.38
	.0003	.03	.02	.05	.02	.02		

Notes: "R^2" refers to "R^2 adjusted for degrees of freedom." Numbers reported below coefficients are standard errors. All currencies are in terms of units of Swiss francs.

**Statistically significant at the 99 percent level.

*Statistically significant at the 95 percent level.

#Statistically significant at the 90 percent level.

##Statistically significant at the 85 percent level.

yen, though significant in the early 1980s, lost its influence in the period 1983–86, and then reemerged with a statistically significant weight later in the decade, reaching .14 in 1991–92.

Indonesian Rupiah

Up to 1982, the rupiah was tightly pegged to the U.S. dollar, which accounted for 97 percent of fluctuations. Beginning in 1983, the peg became

Table 12.6 **Weights Assigned to Foreign Currencies in Determining Changes in Value of Indonesian Rupiah (January 1, 1979–May 8, 1992)**

Years	Constant	Dollar	Yen	DM	Aus$	NZ$	R^2/D-W	Chow/White
1979–80	.0000	1.00**	−.00				1.00/2.99	.22/1.70
	.0000	.00	.00					
	.0000	.99**	−.00	−.00	−.01**	.02**	1.00/2.49	5.38**/33.48*
	.0000	.00	.00	.00	.00	.00		
1981–82	−.0010**	.99**	.00				.98/1.65	3.10*/4.10
	.0003	.02	.02					
	−.0010**	1.01**	.01	−.03	−.01	.00	.98/1.62	1.88/11.73
	.0003	.05	.03	.04	.08	.02		
1983–84	−.0044	.86**	.32				.13/1.99	.51/.96
	.0032	.03	.50					
	−.0044	.84**	.31	.03	.04	−.00	.10/2.00	.37/3.19
	.0033	.33	.51	.55	.26	.15		
1985–86	−.0050	.76**	.91**				.30/1.97	.77/9.60
	.0034	.23	.34					
	−.0062##	.81**	.97**	.61	−.19	−.02	.29/1.97	1.68/25.84
	.0039	.30	.35	.73	.17	.17		
1987–88	−.0007**	.92**	.08**				.99/2.11	1.82/19.78*
	.0002	.01	.02					
	−.0007**	.93**	.08**	.02	−.01	−.00	.99/2.17	.92/25.67
	.0002	.02	.02	.05	.01	.01		
1989–90	−.0008**	.94**	.06**				.97/2.93	.57/5.08
	.0003	.02	.02					
	−.0008**	.92**	.06**	.05	.02	−.01	.97/2.89	.73/12.43
	.0003	.03	.02	.04	.02	.03		
1991–92	−.0009**	.97**	.01				.99/2.30	2.33/1.40
	.0002	.01	.02					
	−.0009**	.98**	.01	−.04	.01	−.01	.99/2.30	2.06/13.12
	.0002	.02	.02	.03	.02	.02		
1979–92	−.0018*	.95**	.16*				.44/2.04	1.97/4.44
	.0007	.05	.07					
	−.0018*	1.01**	.17*	−.00	−.07	.01	.44/2.04	1.30/12.93
	.0008	.07	.07	.13	.06	.05		

Notes: "R^2" refers to "R^2 adjusted for degrees of freedom." Numbers reported below coefficients are standard errors. All currencies are in terms of units of Swiss francs.

**Statistically significant at the 99 percent level.

*Statistically significant at the 95 percent level.

#Statistically significant at the 90 percent level.

##Statistically significant at the 85 percent level.

much looser, though the dollar still had the predominant role. Around 1985, a dramatic change occurred in Indonesian exchange rate policy: the yen suddenly received significant weight. In fact, the point estimate on the yen is actually bigger than that on the dollar for the subperiod 1985–86. This is the period when Indonesia substantially increased the share of its international debt denominated in yen (see table 12.11). Subsequently the yen weight declined, disappearing altogether during the most recent subsample (1991–92).

Philippine Peso

The peso has been firmly pegged or closely linked to the U.S. dollar. At the same time, against the numeraire currency (Swiss franc), the central par value of the peso has also been steadily devalued more than the dollar. So far, it has shown absolutely no sign of following the movement of the yen.

Table 12.7 **Weights Assigned to Foreign Currencies in Determining Changes in Value of Philippine Peso (January 1, 1979–May 8, 1992)**

Years	Constant	Dollar	Yen	DM	Aus$	NZ$	R^2/D-W	Chow/White
1979–80	−.0003	1.01**	−.02				.83/2.81	.26/.95
	.0006	.05	.04					
	−.0003	1.15**	.00	.12	−.12	−.08	.83/2.82	1.12/12.67
	.0006	.12	.05	.13	.14	.09		
1981–82	−.0018**	1.01**	.02				.97/1.93	1.75/1.67
	.0003	.02	.03					
	−.0019**	1.09**	.05	.10	−.14	−.00	.97/1.97	2.60*/20.90
	.0003	.06	.03	.05	.09	.02		
1983–84	−.0083*	1.33**	.05				.19/2.07	.29/3.19
	.0036	.33	.56					
	−.0085*	1.37**	−.03	−.76	.00	−.02	.18/2.06	.25/13.38
	.0036	.37	.57	.61	.28	.16		
1985–86	.0004	1.18**	−.18				.69/2.01	.86/7.47
	.0015	.09	.14					
	−.0002	1.11**	−.19	.45	−.09	.12	.70/1.99	1.04/57.11**
	.0015	.12	.14	.29	.07	.07		
1987–88	−.0003	.99**	−.04				.92/2.34	.03/4.48
	.0004	.03	.06					
	−.0003	.93**	−.09	.00	.06	.01	.92/2.34	.48/23.11
	.0004	.04	.06	.15	.04	.03		
1989–90	−.0024*	1.11**	.05				.75/2.22	1.39/1.67
	.0010	.07	.07					
	−.0023*	1.16**	.08	−.08	.02	−.06	.75/2.23	.83/4.57
	.0010	.11	.08	.17	.09	.11		
1991–92	.0007	1.03**	.01				.71/2.56	.52/2.34
	.0015	.12	.18					
	.0007	1.19**	.05	−.06	−.23#	.05	.71/2.27	.80/20.61
	.0015	.21	.18	.26	.14	.19		
1979–92	−.0018**	1.07**	−.01				.54/2.06	.75/3.00
	.0006	.04	.06					
	−.0018**	1.09**	−.01	−.05	−.05	.03	.54/2.05	.68/10.42
	.0006	.06	.06	.11	.05	.04		

Notes: "R^2" refers to "R^2 adjusted for degrees of freedom." Numbers reported below coefficients are standrard errors. All currencies are in terms of units of Swiss francs.

**Statistically significant at the 99 percent level.

*Statistically significant at the 95 percent level.

#Statistically significant at the 90 percent level.

##Statistically significant at the 85 percent level.

Thai Baht

The baht too has followed relatively closely the movement of the dollar. There was no clear role of the yen in Thai exchange rate policy prior to 1984. But the yen received a statistically significant weight of 0.10 during 1985–86, while the dollar weight declined to 0.71, from 0.91 at the beginning of the

Table 12.8 **Weights Assigned to Foreign Currencies in Determining Changes in Value of Tahi Baht (January 1, 1979–May 8, 1992)**

Years	Constant	Dollar	Yen	DM	Aus$	NZ$	R^2/D-W	Chow/White
1979–80	−.0001##	1.01**	.00				1.00/2.03	3.30/12.44
	.0000	.01	.01					
	−.0002##	1.02**	.01	.00	−.00	−.01	.99/1.94	2.30*/32.07*
	.0001	.02	.01	.02	.02	.02		
1981–82	−.0010	.95**	.05				.76/2.04	.79/1.04
	.0010	.06	.08					
	−..014	1.16**	.13	.17	−.37	.00	.76/1.99	.61/7.40
	.0011	.19	.10	.15	.27	.06		
1983–84	−.0028##	1.31**	.26				.57/2.17	2.92*/44.74**
	.0016	.15	.25					
	−.0029##	1.32**	.26	−.03	.01	−.03	.56/2.18	1.60/60.08**
	.0017	.17	.26	.28	.13	.07		
1985–86	.0008#	.73**	.10*				.93/2.31	6.95**/9.47
	.0004	.03	.04					
	−.0009	.71**	.10*	.08	−.01	.02	.93/2.24	4.04**/34.31*
	.0004	.03	.04	.08	.02	.02		
1987–88	.0002	.84**	−.00				.69/2.53	.35/2.25
	.0009	.06	.12					
	.0003	.90**	.08	.33	−.07	−.05	.69/2.47	1.54/20.39
	.0009	.09	.13	.30	.07	.05		
1989–90	−.0001	.89**	.04				.86/2.99	1.00/1.98
	.0001	.04	.04					
	−.0000	.74**	.02	.11	.12**	.04	.88/2.91	2.50*/41.02**
	.0005	.06	.04	.09	.04	.06		
1991–92	−.0001	.82**	.12**				.99/2.61	.38/4.90
	.0002	.01	.02					
	−.0002	.81**	.12**	.07**	−.01	.01	.99/2.70	.55/26.35
	.0002	.02	.02	.03	.02	.02		
1979–92	−.0004	.91**	.05##				.75/2.24	5.45**/7.33
	.0003	.02	.03					
	−.0004	.92**	.05##	.03	−.01	−.00	.75/2.24	3.14**/17.81
	.0003	.03	.03	.06	.03	.02		

Notes: "R^2" refers to "R^2 adjusted for degrees of freedom." Numbers reported below coefficients are standard errors. All currencies are in terms of units of Swiss francs.

**Statistically significant at the 99 percent level.

*Statistically significant at the 95 percent level.

#Statistically significant at the 90 percent level.

##Statistically significant at the 85 percent level.

sample. Evidently Thailand—like Singapore, Hong Kong, and Indonesia—shifted a bit from the dollar to the yen in the mid-1980s, when the dollar was near its peak. During 1987–90, this shift was reversed. And then from 1991 to May 1992, the yen weight rose again to 0.12 (significant at the 99 percent level), with the remaining weight divided between the U.S. dollar and DM (0.81 and 0.07, respectively). As with the other East Asian currencies studied, the U.S. dollar currently remains more important than the yen.

Chinese Yuan

China claims to be on a basket peg. But the U.S. dollar is the only currency with whose value the yuan is highly correlated. From 1987 onward, the yuan has been relatively rigidly pegged to the dollar, although devaluations of the par have also been frequent, particularly toward the end of the sample period. Neither the yen nor any other non–U.S. dollar currency seems to play a role in the external value of the yuan.

To summarize, to date the U.S. dollar has remained the dominant currency to which all the East Asian economies pay attention in their exchange rate policies. The Japanese yen occupies some weight in some countries, but is still far from replacing the U.S. dollar in the region. We now briefly consider other measures of international currency use, before turning to trade.

12.2.2 The Use of the Dollar and Yen in Invoicing

It is interesting to observe that, even though the share of the Japanese economy in the world economy has risen substantially, the internationalization of the yen has not tempted East Asian governments to link their currencies more strongly with the yen. Despite the fact that trading with Japan has become increasingly important for the East Asian developing countries, and reducing exchange rate volatility is thought to help trade in goods and services, the yen remains in low profile. Why? Developing and developed countries alike are known to invoice their trade in U.S. dollars, rather than in their own or trading partners' currencies. Given trade invoiced in dollars, pegging to the dollar creates less exchange rate risk than pegging to the yen. But then the question becomes, Why is the dollar still the dominant currency in invoicing even for trade with Japan?

There is some evidence that the yen is 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 12.10 shows that the share of trade denominated in yen is greater in Southeast Asia than in other regions and that there was an especially rapid increase from 1983 to 1990 in the share of Southeast Asian imports denominated in yen. Table 12.11 shows that the yen share among five major Asian debtors nearly doubled between 1980 and 1988, entirely at the expense of the dollar (Tavlas and Ozeki [1991, 1992] give further statistics and discussion). It is too early to tell whether this

Table 12.9 **Weights Assigned to Foreign Currencies in Determining Changes in Value of Chinese Yuan (January 1, 1979–May 8, 1992)**

Years	Constant	Dollar	Yen	DM	Aus$	NZ$	R^2/D-W	Chow/White
1979–80	.0007	1.09**	.02				.76/2.53	.46/10.41
	.0009	.07	.06					
	.0008	1.00**	.02	.02	.05	.05	.75/2.55	.39/33.72
	.0009	.17	.06	.18	.20	.14		
1981–82	−.0020**	.05**	.14*				.65/1.99	1.36/4.73
	.0008	.05	.06					
	−.0009	.10	.01	.28**	.38*	.12**	.72/1.89	1.70/13.16
	.0007	.13	.07	.10	.19	.04		
1983–84	−.0023**	.53**	−.07				.42/1.95	7.81**/4.90
	.0008	.07	.12					
	−.0022**	.53**	−.04	.25#	−.05	.02	.44/1.97	4.38**/20.79
	.0008	.08	.12	.13	.06	.03		
1985–86	−.0027#	1.02**	−.26#				.60/2.05	.58/4.47
	.0015	.09	.14					
	−.0023##	.94**	−.28#	−.07	.09	.05	.60/2.08	1.34/33.03*
	.0016	.12	.14	.30	.07	.07		
1987–88	.0000	1.00**	.006				1.00/3.10	1.73/11.39*
	.0000	.00	.004					
	−.0000	1.00**	.005	−.01	.00	.00	1.00/3.09	1.00/20.48
	.0000	.00	.005	.01	.00	.00		
1989–90	−.0036##	1.04**	−.20				.24/2.09	.11/1.36
	.0025	.19	.18					
	−.0034	1.20**	−.10	−.49	−.03	−.08	.22/2.15	.68/11.41
	.0026	.28	.20	.43	.22	.30		
1991–92	−.0007**	.98**	−.03				.99/2.15	.69/5.79
	.0002	.02	.03					
	−.0006**	.98**	−.02	−.55	−.05**	.05#	.99/1.78	1.34/29.7
	.0002	.03	.03	.04	.02	.03		
1979–92	−.0018**	.87**	−.04				.54/2.05	8.99**/2.14
	.0005	.04	.05					
	−.0017**	.79**	−.06	.05	.06##	.04	.54/2.06	5.71**/10.97
	.0005	.05	.05	.09	.04	.03		

Notes: "R^2" refers to "R^2 adjusted for degrees of freedom." Numbers reported below coefficients are standard errors. All currencies are in terms of units of Swiss francs.

**Statistically significant at the 99 percent level.

*Statistically significant at the 95 percent level.

#Statistically significant at the 90 percent level.

##Statistically significant at the 85 percent level.

increase of the role of the yen is a permanent trend. But for present purposes, the key point is that the share of the yen in the denomination of trade and finance has not increased anywhere nearly as rapidly as has Japan's share in East Asian trade.

Why should the dollar rather than the yen continue to be the preferred invoicing currency? Several explanations are generally given. First, short-term

Table 12.10 **Share of the Yen in Denomination of Foreign Trade (%)**

	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, 33).

Table 12.11 **Yen Share in Debt Denomination and Official Reserve Holdings (%)**

	Yen Share in External Debt						Yen Share in Official Holdings	
Year	Indonesia	Korea	Malaysia	Philippines	Thailand	Total	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

Source: Tavlas and Ozeki (1992, 39).

*Selected Asian countries (not including Japan).

financial markets, particularly bankers' acceptances, are not as well-developed in Japan as in, for example, New York or London, so that the yen is a less convenient currency in which to finance trade. One possibility is that Japan itself resists the internationalization of the yen in order to avoid large fluctuations of its reserves, or to avoid destabilizing effects on its domestic price level, and thus that the slow internationalization of Japanese financial markets is government policy.[7] Second, a large percentage of Japanese trade is conducted by the huge trading firms called *sogo shosha;* they are more able to diversify and

7. At the time of the yen/dollar talks in 1984, the Japanese government was not enthusiastic about internationalizing the yen (Frankel 1984). More recently, some Japanese have come to favor it. Suzuki (1991, 26–30) thinks that internationalizing the yen in East Asia would be a good idea.

hedge claims and liabilities in a foreign currency than would be a small exporter or importer. Third, oil, minerals, and other raw materials and basic commodities occupy a large share of trade in East Asia, because Japan must import so much and Southeast Asia exports so much; such commodities tend everywhere to be invoiced in dollars. Fourth, a high percentage of East Asian trade is with the United States and the rest of the Western Hemisphere, where the dollar is the dominant international currency. Fifth, Japanese firms are believed to undertake "pricing to market," especially in the U.S. export market, because they are readier than U.S. firms to suffer short-run fluctuations in their profits for the sake of maintaining market share.[8]

There is a strong "multiple equilibrium" or "coordination" aspect to the international currency problem. Krugman (1980, 1984) modeled the worldwide economies of scale in the choice of international currency. Any country expecting to use the dollar as the invoicing currency for the next transaction prefers to use the dollar as the invoicing currency in this round. The result is that there are multiple (locally stable) equilibria in the choice of international currency, and the dollar (or the pound before it) could remain the dominant currency even after the patterns of trade and production have shifted.

As long as the dollar remains the dominant invoicing currency in international trade and lending, it makes sense for the East Asian economies to continue to assign heavy weights to the dollar. Of course, the economies-of-scale analysis that applies to the choice of an international currency for invoicing trade also applies to the choice of an international currency for pegging and other uses.

An analogy with the English language can be, and has been, made. A foreign visitor to China is likely to encounter on the street two requests more than any others: a request for dollars (in exchange for local currency) and a request to speak English (so that the person can practice). It is not the superior intrinsic qualities of the language, or the currency, that they are after, nor is it especially the prestige of the United States. Rather, English is rapidly becoming the lingua franca of Asia, as it is of the world, simply because the world needs a lingua franca, and there is no other obvious choice. The same may be true of the dollar.

12.3 Is There a Regional Trade Bloc Centered on Japan?

There is no standard definition of a "trade bloc." A useful definition might be a group of countries who are concentrating their trading 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

8. Reasons for the disproportionately low use of the yen in invoicing are given in Frankel (1984), Ito (1992), and Tavlas and Ozeki (1992). Frankel (1991c) considers the international currency question and gives further references.

policy, or perhaps of factors that are noneconomic 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, as noted at the outset of this paper.

In East Asia, by contrast, overt preferential trading arrangements or other political moves to promote regional economic integration are lacking. The Association of Southeast Asian Nations (ASEAN) countries, 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 Asian bloc dominated by Japan.

In fact, Japan is unusual among major countries in *not* 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 (for one of many examples, see Dornbusch 1989). This is a hypothesis that should not be accepted uncritically, but rather needs to be examined empirically.

We must begin by acknowledging the obvious: the greatly increased economic weight of East Asian countries in the world economy. The rapid outward-oriented growth of Japan, followed by the four East Asian NICs 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 intraregional trade is higher, or increasing more rapidly, than would be predicted based on such standard economic factors as the GNP or growth rates of the countries involved.

12.3.1 Adjusting Intraregional Trade for Growth

Table 12.12 reports three alternative ways of computing intraregional 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.[9] For comparison, the analogous statistics are reported for Western Europe (the EC12) and for North America (the United States, Canada, and Mexico).

The share of intraregional trade in East Asia increased from 33 percent in 1980 to 37 percent in 1989. Pronouncements that a clubbish trade bloc is form-

9. These statistics are presented in more detail in table 1 in Frankel (1991a).

Table 12.12 Summary Measures of Intraregional Trade Biases

	Year	Pacific Asia	North America	European Community
1. Intraregional trade/total trade	1980	.33	.32	.51
	1986	.32	.35	.57
	1989	.37	.36	.59
2. Intraregional 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. Intraregional bias holding constant for GNP, population, distance, etc.	1980	.70	.53	.23
	1985	.40	.34	.44
	1990	.60	.97	.46

Sources: 1, Schott (1991); *Direction of Trade,* (Washington, D.C.: International Monetary Fund, various issues), as computed in Frankel (1991c). 2, computed as the ratio of line 1 to shares of world trade, as in Frankel (1991a). 3, gravity regressions, reported in tables 2, 3, and 4, respectively, Frankel (1992a). They include also significant coefficients on the APEC bloc, among other variables.

ing in the region are usually based on figures such as these. But the numbers are deceptive. It is easy to be misled by intraregional trade shares such as those reported in table 12.12. If one allows for the phenomenon that most of the East Asian countries in the 1980s experienced rapid growth in *total* output and trade, then in fact there has been no movement toward intraregional bias in the evolving pattern of trade. The increase in the intraregional share of trade that is observed in table 12.12 could be entirely due to the increase in the economic size of the countries. A simple back-of-the-envelope calculation that corrects trade shares for the size of the partner countries, reported in table 12.12, item 2, shows that this is indeed the case.[10] The East Asian bias toward within-region trade, far from rising, actually diminished slightly in the 1980s!

12.3.2 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.[11] A dummy variable can then be added to represent when both countries in a given pair belong to the same regional grouping, and one

10. Frankel (1992a). This conclusion also emerges for time-spans stretching farther back in history. Economists such as Drysdale and Garnaut (1992), Anderson and Norheim (1992), and Petri (1992a) have been reporting this for some time, based on similar calculations of "intensity of trade indexes" or "double-relative measures."

11. Wang and Winters (1991) and Hamilton and Winters (1992) have recently applied the gravity model to the question of potential Eastern European trade patterns, and Wang (1992) to China's trade. They and Frankel (1992a) give references on the gravity model.

can check whether the level and 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.

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 (= 63 × 62/2) for a given year. 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.[12]

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 sizes. These factors are the essence of the gravity model. A large part of the apparent bias toward intraregional 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. A bit of experimentation with functional forms is described in Frankel (1992a). We also add a dummy ADJACENT variable to indicate when two countries share a common land border.

The equation to be estimated is:

$$\begin{aligned}\log(T_{ij}) = {} & \alpha + \beta_1 \log(GNP_i GNP_j) + \beta_2 \log[(GNP/pop)_i (GNP/pop)_j] \\ & + \beta_3 \log(\text{DISTANCE}) + \beta_4(\text{ADJACENT}) + \gamma_1(\text{EEC}_{ij}) \\ & + \gamma_2(\text{WH}_{ij}) + \gamma_3(\text{ASIA}_{ij}) + u_{ij}.\end{aligned}$$

The last four explanatory factors are dummy variables.

Entering GNPs in product form can be easily justified by the modern theory of trade under imperfect competition.[13] In addition there is reason to believe that GNP per capita has a positive effect, for a given size: as countries become

12. The list of countries, regional groupings, and cities used to compute distances, is given in an appendix to Frankel (1992a).

13. The specification implies that trade between two equal-sized countries (say, of size .5) will be greater than trade between a large and a small country (say, of sizes .9 and .1). This property of models with imperfect competition is not a property of the classical Heckscher-Ohlin theory of comparative advantage. See 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, 503–6).

more developed, they tend to specialize more and to trade more. Other gravity model studies often estimate separate equations for exports and imports and allow the coefficients on GNP and GNP per capita (or, equivalently, population) to differ between the importing and exporting country. When we aggregated exports and imports, we implicitly assumed that these elasticities were symmetric. Our motivation in estimating the equation in terms of exports *plus* imports is to eliminate the macroeconomic factors, such as real exchange rate fluctuations and relative positions in the business cycle, that necessarily influence the level of exports and the level of imports considered individually.[14]

The results are reported in tables 2, 3, and 4 of Frankel (1992a). We found all three standard variables to be highly significant statistically (> 99 percent 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 nonadjacent countries is higher by 1 percent, the trade between them falls by about .56 percent.

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 most of the explanatory power. There would be little 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 intraregional trade would be due solely to the proximity of the countries and their rapid rate of overall economic growth. But we found that dummy variables for intraregional trade *are* 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 percent more than they would otherwise, even after taking into account distance and the other gravity variables ($\exp(.53) = 1.70$). Intraregional trade goes beyond what can be explained naturally by proximity.

It is as yet difficult to draw conclusions regarding economic welfare, because the empirical equation is too far removed from theoretical foundations. But it seems possible that the amount of intraregional 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

14. The results in Wang and Winters (1991) and Hamilton and Winters (1992) show coefficient estimates for importing and exporting countries that are fairly close, but nonetheless show nonoverlapping confidence intervals. Our estimates are extremely close to theirs for the importing country, which are slightly smaller than theirs for the exporting country.

could be the case if trade-diversion outweighs trade creation. Inspired by Krugman's (1991a, 1991b) "natural trading bloc" terminology, we might then refer to the observed intraregional trade bias as evidence of "supernatural" trading blocs.

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 (EAEC), which excludes Australia and New Zealand, the coefficient on the Asian bloc appears to be stronger than that on the European or Western Hemisphere blocs. Even when the boundaries are drawn in this way, however, there is no evidence of an *increase* in the intraregional 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 noted in section 12.3.1. 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).[15] None of these changes over time is statistically significant.

It is perhaps surprising that the estimated *level* of intraregional 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, we find the overseas Chinese to be a more plausible factor than the Japanese.

Of the three trading blocs, the European Economic Community (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 intraregional 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 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 EEC.

The Western Hemisphere coefficient experienced all its increase in the second half of the decade, exceeding .9 by 1990. The rapid increase in Western Hemisphere intraregional 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.

15. Petri infers, from the data on intraregional trade shares, a decrease in East Asian interdependence in the early 1980s, followed by a reversal in the second half of the decade.

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.[16] We call this grouping "Asian Pacific" in the tables. Its coefficient and significance level both appear higher than the EAEC dummy. But when we broaden the bloc search and test for an effect of the Asian Pacific Economic Cooperation group (APEC), which includes the United States and Canada in with the others, it is highly significant. The significance of the Asian Pacific dummy completely disappears, and that of the EAEC dummy returns.

It appears that APEC is the correct place to draw the boundary. The APEC effect is striking: 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 1.5 (1980), 1.3 (1985), and 1.4 (1990).[17]

One possible explanation for the apparent intraregional 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 over land, and that ocean shipping is less expensive than shipping by rail or road.[18] This issue bears further investigation. 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. In 1977, ASEAN negotiated a preferential trading arrangement within its membership (although serious progress in removal of barriers did not get underway until 1987). 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.[19]

16. This is the grouping used in table 12.12.

17. Others have reported 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 in a larger region will consist of intraregional trade than in a smaller region, even when there is no intraregional 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 percent of trade is intra-"regional."

18. Wang (1992) enters land distance and water distance separately in a gravity model. She finds a small, though statistically significant, difference in coefficients.

19. In tests similar to ours, Hamilton and Winters (1992), Wang (1992), and Wang and Winters (1991) 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.

We have carried out some other extensions elsewhere. In Frankel (1992a), we allow for the greater openness of East Asian countries generally, and of Hong Kong and Singapore in particular. These dummy variables are highly significant. The inclusion of each variable has relatively little effect on the coefficients of the original variables in the equation (with a coefficient of .9) when it is included, but the net effect of all of them (particularly the simultaneous presence of the APEC bloc variable and Asian openness variable) is to diminish the East Asian bloc variable to borderline significance. We also disaggregated trade into manufactured goods, agricultural products, fuels, and other raw materials. In Frankel and Wei (1993), we undertake still more extensions, such as including factor endowment terms, estimating openness or trade-diversion effects in other parts of the world, and checking for robustness with respect to heteroscedasticity and the omission of zero-trade points. In each case, the results changed little.

To summarize the most relevant effects, if two countries both lie within the boundaries of APEC, they trade with each other 100 percent more than they otherwise would. The nested EAEC bloc is less strong, and has declined slightly 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 more with each other, and that East Asian countries are growing rapidly, there is no evidence that they are collectively moving toward a trade bloc in the way that Western Europe and the Western Hemisphere appear to be.

12.4 The Correlation between Bilateral Exchange Rate Variability and Bilateral Trade Flows

12.4.1 The Role of Exchange Rate Stabilization

One rationale for assigning weight to a particular currency in determining one's exchange rate is the assumption that a more stable bilateral exchange rate will help promote bilateral trade with the partner in question. This is a major motivation for exchange rate stabilization in Europe. There have been quite a few time-series studies of the effect of exchange rate uncertainty on trade overall,[20] but fewer cross-sectional studies of bilateral trade.

One exception is De Grauwe (1988), which looks at only ten industrialized countries (and is motivated in part by the European experience). Two others

20. For example, Hooper and Kohlhagen (1978), Kenen and Rodrik (1986), and Akhtar and Hilton (1984). The literature is surveyed in IMF (1983).

are Abrams (1980) and Brada and Mendez (1988). We will reexamine the question here using a data set that is more recent as well as broader, covering 63 countries. A problem of simultaneous causality should be noted at the outset: if exchange rate variability shows up with an apparent negative effect on the volume of bilateral trade, it could be due to the government's efforts to stabilize the currency vis-à-vis a valued trading partner as easily as the reverse. With this consideration, we will also use the method of instrumental variable estimation to tackle the possible simultaneity bias.

Volatility is defined to be the variance of the first difference of the logarithmic exchange rate. We start with the volatility of nominal exchange rates and embed this term in our gravity equation for 1980, 1985, and 1990. The results are reported in table 12.13. Most coefficients are similar to those reported in the earlier results without exchange rate variability, though the majority of the bloc dummy variables appear with slightly lower coefficients, suggesting that a bit of the bloc effect may have been attributable to exchange rate links. In 1980, the coefficient for the volatility term is indeed negative and statistically significant at the 99 percent level. The magnitude is moderately small. On average, a one percent increase in the standard deviation reduces bilateral trade by 0.046 percent, holding constant all other variables. In 1985, the volatility parameter is no longer significant (with the point estimate turning positive). In 1990, the volatility coefficient becomes positive and statistically significant at the 99 percent level.

These puzzling results need not be taken at face value, since a presumably more relevant measure of exchange rate uncertainty is the volatility of real exchange rates, which takes into account the differential inflation rates in the two countries in addition to movements in nominal exchange rates. Regressions with the volatility of real exchange rates are also presented in table 12.13. In 1980, the volatility parameter is still negative (-0.66) and statistically significant. The parameter for 1985 is negative, though still insignificant. In sharp contrast to the regression with the volatility of nominal rates, the volatility parameter for 1990 is a statistically significant negative number (-0.48). In short, these results are consistent with one's prior expectation that real exchange rate volatility depresses bilateral trade. The change in the intraregional bias coefficients when exchange rate volatility is included in the equation also suggest that part of the regional trade bloc effects reported above for Europe and the Western Hemisphere were attributable to patterns of exchange rate variability. This would appear to be a piece of evidence that the stabilization of exchange rates within Europe has helped to promote intra-European trade.

Even part of the Pacific term appears to be attributable to exchange rate patterns, which one could interpret as the effect of the strong role played by the dollar throughout the region. The East Asian coefficient, on the other hand, is not at all reduced by the presence of the exchange rate volatility term. This

Table 12.13 **Exchange Rate Volatility and Bilateral Trade (OLS estimation)**

	Volatility	GNP	GNP/pop	DISTANCE	ADJACENT	WH	EEC	EAEC	APEC	Adjusted R^2	SEE
1980											
		.74**	.29**	−.56**	.72**	.52**	.23	.88**	1.51**	.71	1.20
		.02	.02	.04	.18	.15	.18	.27	.17		
Nominal exchange rate	−.046*	.76**	.26**	−.68**	.27	.16	.03	1.04**	1.35**	.73	1.20
	.023	.02	.02	.05	.21	.23	.18	.37	.20		
Real exchange rate	−.066*	.74**	.27**	−.67**	.43#	.18	.04	.96**	1.38**	.76	1.14
	.029	.02	.02	.05	.22	.20	.20	.37	.22		
1985											
		.76**	.25**	−.70**	.75**	.33**	.44*	.59*	1.28**	.74	1.17
		.02	.02	.04	.18	.16	.17	.26	.17		
Nominal exchange rate	.015	.77**	.24**	−.74**	.61**	.23	.43*	.79*	1.18**	.75	1.16
	.021	.02	.02	.05	.19	.18	.17	.36	.19		
Real exchange rate	−.026	.76**	.24**	−.75**	.45*	.01	.26##	.72*	1.12**	.78	1.12
	.028	.02	.02	.05	.22	.20	.17	.36	.21		
1990											
		.75**	.09**	−.56**	.79**	.92**	.47**	.69*	1.36**	.77	1.07
		.02	.02	.04	.16	.14	.16	.24	.15		
Nominal exchange rate	.076**	.77**	.09**	−.66**	.61**	.82**	.54**	.75*	1.36**	.79	1.04
	.014	.02	.02	.04	.16	.14	.16	.33	.17		
Real exchange rate	−.048**	.79**	.11**	−.60**	.31##	.51**	.27##	.95*	1.06**	.83	.97
	.023	.02	.02	.04	.20	.17	.17	.38	.28		

Notes: All the variables except the dummies are in logarithm. All the regressions have an intercept for which the estimate is not reported here. Standard errors are below the coefficient estimates.

**Statistically significant at the 99 percent level.

*Statistically significant at the 95 percent level.

#Statistically significant at the 90 percent level.

##Statistically significant at the 85 percent level.

result is what we would expect, in light of our findings in the first part of the paper that most of the East Asian currencies still give much less weight (if any at all) to the yen than to the dollar.

All such interpretations are threatened however, by the likelihood of simultaneity bias in the above regressions. Governments may choose deliberately to stabilize bilateral exchange rates with their major trading partners. This has certainly been the case in Europe, for example. Hence, there could be a strong correlation between trade patterns and currency linkages even if exchange rate volatility does not depress trade. To address this problem, we use the method of instrumental variable estimation, with the standard deviation of relative money supply as our instrument for the volatility of exchange rates.[21] The results are reported in table 12.14.

Let us concentrate our discussion on the regressions involving real exchange rates. In 1980, the volatility parameter is still negative and significant at the 90 percent level. But the magnitude (−0.10) is smaller than without using the instrument, suggesting that part of the apparent depressing effect of volatility was indeed due to the simultaneity bias. (Also, the presence of the volatility term no longer produces a clear drop in the EC and WH bloc terms.) Similarly in 1985, the volatility parameter has a correspondingly smaller point estimate and is statistically indistinguishable from zero. Finally, in 1990, the volatility parameter turns again into a positive number (0.32) which is significant at the 99 percent level.

These results suggest that if exchange rate volatility did depress bilateral trade, its negative effect appears to have diminished over the course of the 1980s. This sharp change is somewhat surprising. One possible explanation is the rapid development of exchange-risk hedging instruments. In particular, futures and forward markets for a broad range of currencies came into much wider use in the 1980s. Currency options were introduced in the United States at the end of 1982 on the pound/dollar, yen/dollar, and DM/dollar rates and soon spread to cover virtually all major currencies by late 1980s. The use of currency swaps was also on the rise. The market in financial instruments to hedge against exchange rate fluctuations, in addition to expanding in scope, has also become more efficient, lowering costs to hedgers.[22]

If exchange rate volatility no longer seriously depresses bilateral trade, then whether East Asian countries stabilize their currencies against the yen will not directly affect their trading volume with Japan and with each other. The gravity

21. The argument in favor of this choice of instrument is that relative money supplies and bilateral exchange rates are highly correlated, in theory (they are directly linked under the monetary theory of exchange rate determination), and in our data as well, but monetary policies are less likely than exchange rate policies to respond to bilateral trade.

22. The costs of doing foreign exchange transactions are themselves related to the volatility of the exchange rate. For a recent theoretic and empirical study on the relationship between bid-ask spreads and volatility, see Wei (1991). After controlling for volatility, Glassman (1987) finds some evidence that transaction costs in the foreign exchange market have decreased over time.

Table 12.14 **Exchange Rate Volatility and Bilateral Trade (instrumental variable estimation)**

	Volatility	GNP	GNP/pop	DISTANCE	ADJACENT	WH	EEC	EAEC	APEC	Adjusted R^2	SEE
1980											
Nominal exchange rate	−.008##	.73**	.27**	−.56**	.74**	.54**	.20	.93**	1.48**	.71	1.20
	.005	.02	.02	.04	.18	.15	.18	.27	.17		
Real exchange rate	−.010*	.73**	.26**	−.56**	.75**	.56**	.22	.94**	1.48**	.71	1.20
	.005	.02	.02	.05	.18	.15	.18	.27	.17		
1985											
Nominal exchange rate	−.001	.76**	.24**	−.70**	.76**	.34*	.43*	.59*	1.28**	.74	1.17
	.005	.02	.02	.04	.18	.16	.17	.26	.17		
Real exchange rate	−.000	.76**	.25**	−.70**	.75**	.33*	.43*	.59*	1.28**	.74	1.17
	.005	.02	.02	.04	.18	.16	.17	.26	.17		
1990											
Nominal exchange rate	.029**	.77**	.15**	−.57**	.71**	.88**	.44**	.47*	1.40**	.77	1.06
	.005	.02	.02	.04	.16	.14	.16	.24	.15		
Real exchange rate	.032**	.77**	.15**	−.57**	.71**	.87**	.43**	.45#	1.39**	.78	1.06
	.005	.02	.02	.04	.16	.14	.16	.24	.15		

Notes: All the variables except the dummies are in logarithm. All the regressions have an intercept for which the estimate is not reported here. Standard errors are below the coefficient estimates.

**Statistically significant at the 99 percent level.

*Statistically significant at the 95 percent level.

#Statistically significant at the 90 percent level.

##Statistically significant at the 85 percent level.

regressions reported here bear further investigation to test the robustness of the relationships.[23]

12.5 Is It Japan or the United States That Wants the Yen to Play a Greater Role in East Asia?

An important question related to the issue of yen bloc has thus far been left unanswered. Are the financial and monetary trends of the increased importance of the yen, to the extent they exist at all, the outcome of deliberate policy measures on the part of Japan? 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. On the contrary, at least until recently, the Japanese government was inclined to resist whatever tendency there was 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 (Frankel 1984). It has also been the U.S. government that has been pushing Korea and the 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.[24] An increasing role for 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.

12.5.1 Negotiations on the Korean Won

Korea and Taiwan were singled out by the U.S. Treasury in 1989, to "liberalize" their foreign exchange rate policies, with the implied outcome of being delinked from the dollar. Here, we study the case of Korea to illustrate the role of U.S. pressure in East Asian exchange rate policies.

Korea maintained a fixed exchange rate against the dollar in the late 1970s. As the inflation rate was higher at home than abroad, the won became progressively more overvalued in real terms, and exports suffered as a result. In 1979 the government enacted an important and needed program of macroeconomic stabilization and microeconomic reform. In January 1980 the won devalued by 20 percent. This devaluation, and the contractionary macroeconomic measures

23. We plan, for example, to include terms for factor endowments, levels of trade barriers, and political and linguistic associations.

24. Balassa and Williamson (1990), Noland (1990), and Frankel (1989). Financial negotiations between the U.S. Treasury and the governments of Korea and Taiwan were a response to congressional passage of the 1988 Omnibus Trade Bill.

taken in the preceding year, succeeded in stimulating rapid export growth and reducing the current account deficit. This left Korea as one of the few major debtors that was well positioned when the 1982 international debt crisis hit (Balassa and Williamson 1990; Collins and Park 1989; Kim 1990).

The official exchange rate policy in 1980 became one of defining the won's value in terms of a basket of five foreign currencies, rather than just the dollar.[25] Korea, as many other countries on a basket peg do, does not publicly announce what the currency weights are. The IMF was perceptive enough to classify Korea as a "managed floater" rather than a "basket-pegger." Test like those reported in section 12.2 (table 12.1) confirm that nondollar currencies in fact played very little role in this "basket."

The phase of dollar depreciation that began in 1985, as represented by the Plaza Accord, was welcomed in Korea as one of "three blessings" in the world economic environment: low dollar, low interest rates, and low oil prices. For two years Korea kept the won close to the dollar, which meant a substantial depreciation against the yen and other currencies, and basked in the stimulus to its exports. But the country responded to U.S. pressure by appreciating the won against the dollar in 1987 and 1988.

The U.S. government has continued to press Korea to delink the won from the dollar. The U.S. Treasury's October 1989 report announced: "Recently, the Treasury and the Korean Ministry of Finance have agreed to initiate talks on financial policies, including the exchange rate system and capital market issues. We hope to encourage a more market-oriented exchange rate system in Korea within the framework of these talks" (U.S. Department of the Treasury 1989, 29). Two rounds of financial policy talks took place in February and November 1990. Those talks did not explicitly focus on the level of the won/dollar rate per se. Rather, the United States sought to "encourage the liberalization of Korea's exchange rate system and of the capital and interest rate controls that impede the full operation of market forces." Just what is meant by "market-oriented exchange rate system" or "liberalization"? Given that the won had been rigidly targeted to the dollar, a liberalization implies a delinking. It was expected by the U.S. government that the won would appreciate against the dollar as a consequence of the "liberalization." Since bilateral trade and investment between Korea and Japan are large and increasingly important, another natural outcome would be a new degree of linkage between the won and the yen.

On March 2, 1990, the Korean authorities adopted a "market average rate" (MAR) system of setting the exchange rate each week (Hwang 1990, 15). This reform led the U.S. Treasury to drop charges of exchange rate manipulation in its April 1990 report, where the earlier won appreciation was apparently not sufficient to convince it to do so. The U.S. Treasury in its May 1991 report

25. Supposedly, according to Lindner (1991, 5) and Wang (1991, 3), the basket includes the U.S. dollar, yen, DM, pound, and Canadian dollar.

found: "During the first thirteen months of the MAR system (through April 12, 1991), the won depreciated 4.4 in nominal terms against the dollar. . . . Foreign banks accounted for a large share of transactions in the inter-bank market, generally 40–60 percent of the total. The Bank of Korea (BOK) was not a direct participant in the market, and other government-owned banks accounted for only a small share of inter-bank activity" (1991, 15). This sounds like a genuinely market-oriented system.

The U.S. Treasury notes in the same 1991 report, however, that "the Korean authorities maintain a comprehensive array of controls on foreign exchange and capital flows." Our regression result in section 12.2 actually provides a suggestive indication of continued heavy government intervention. The coefficient on the dollar and the R^2 term suggest that the link to the dollar was as strong during the period 1991 to May 1992 as in the preceding two to four years.

12.6 Concluding Remarks

This paper reaches several conclusions. (1) The U.S. dollar continues to be the dominant international currency in East Asian exchange rate policies. All nine East Asian countries have assigned heavy weight to the dollar, and many of them to the dollar alone. (2) Some currencies increased their weight on the yen during the mid-1980s. This may have been associated with the overvaluation of the dollar, instead of a genuine and steady increase in the role of the yen. Only two or three currencies actually showed a sign of increased yen weight at the end of the sample. Overall, the evidence does not suggest a substantial trend of an increased role for the yen in East Asian exchange rate policies.

(3) The level 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 that can be explained by distance, GNPs, and other gravity variables. However, (4) there is no evidence of any trend increase in the intra-Asian trade bias, (5) the intra-Asia trade bias is not centered on Japan, (6) the strongest "bloc" of any is the trans-Pacific one (APEC), including the United States and Canada along with the East Asian countries, and (7) the East Asian bloc effect diminishes when we include terms for APEC and for the general openness of Asian countries.

(8) Adding bilateral real exchange rate variability to the equation explaining bilateral trade flows, we find a significant effect in 1980, decreasing subsequently. Such cross-sectional evidence is an important addition to the time-series evidence on the effect of exchange rate uncertainty on trade. An important caveat is that an attempt to correct for likely simultaneity bias eliminated any negative effect of exchange rate volatility on trade in 1990 (though some remains in 1980). (9) The effect of exchange rate variability is relatively small. Even in the European Community, which did in some sense become a

currency bloc in the 1980s, the stabilization of exchange rates explains only a small part of our estimated trade-bloc effects.

Overall, the evidence with respect to both trade and currency links suggests little support for the formation of a yen bloc. On the contrary, East Asian countries continue to be strongly linked to the United States. Why does the yen not play a larger role in East Asian exchange rate policies? The U.S. dollar remains the preferred invoicing currency in international trade and lending, even within Asia, presumably for reasons of scale economies and history. Perhaps the even smaller role for the yen in exchange rate policies can be attributed to the same causes.

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Comment

Koichi Hamada

In this paper questions are clearly stated, analysis thoroughly carried out, and interpretations articulately given. I have no strong arguments against most of the authors' findings and conclusions. I differ only in the emphasis I would put on the findings and in the nuance of my interpretation. Let me summarize here the authors' main statements and my reactions to them.

"All nine East Asian countries have assigned heavy weights to the dollar, even though some countries have assigned increasing weights to the yen in recent years."

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There would be a gap in the logic if one concluded from this statement that East Asia should be in the dollar bloc. The missing link, a hidden assumption, is that each country was driven by a purely economic rationale in its exchange-rate policy. In practice, however, political considerations may have motivated the pegging policy.

I would not carry this argument much further because I do not mean that putting more weight on the yen would be more rational. Due to the public-good nature of an international currency, which is well described in this paper, it is natural that many countries put heavy weight on the currency that is dominantly used as the international medium of exchange.

"Though the *level* of trade in East Asia is biased toward intraregional trade to a greater extent than can be explained by distance, GNPs, etc., there is no evidence of any *increasing trend* in intra-Asia trade, and the intra-Asia trade bias is not centered on Japan."

The absence of trend coincides with our findings (Goto and Hamada, chap. 14 in this volume). But is the level not as important as the pace of changes in the discussion of a currency union? It was quite natural for European countries to increase the intraregional bias in recent years when they were moving toward economic integration. Is it not important to point out that the degree of interrelatedness in trade among Asian countries have been high in spite of the absence of such a movement toward economic integration?

Geographical distance is important and the gravity model is a useful way to take account of geographical considerations. The authors seem to imply that the intraregional trade bias due to proximity is not grounds for the formation of a currency bloc. But if intraregional trade bias is strong because of the affinity of locations, it will not preclude the desirability of creating an integrated market within a region. If Asian nations are trading much with each other because of the geographical affinity among them—indeed, an understandable phenomenon—it will not weaken the case for creating a unified currency area among them.

There is one inaccurate statement in the paper: In section 12.5, the authors write, "at least until recently, the Japanese government was inclined to resist *whatever* tendency there was for the yen to become an international currency in competition with the dollar" (emphasis mine). Indeed, the Japanese monetary authorities retained until recently many regulations to protect domestic financial institutions. They did not encourage sufficiently the rapid creation of a full-fledged domestic short-term capital market. Those regulations and policies sometimes worked against the more extensive use of the yen as an international currency. They regulated, however, for the sake of protecting domestic financial institutions. They did not have a consistent policy of resisting all tendencies toward the internationalization of the yen. Even within the Ministry of Finance, as in other bureaus like the Ministry of International Trade and Industry (MITI), there was tension between the internationalists who advocated in-

ternationally oriented policy and the traditionalists who defended the policy of protecting domestic markets. The statement in this paper is much too strong.

In summary, this paper presents coherent documentation of facts and quantitative tests. The conclusions should be taken with a grain of salt, however. Alternative interpretations are possible. As the authors convincingly argue, the statistics do not support the immediate need for a currency bloc centering on the yen. But neither do they preclude the desirability of a currency area of Asian nations by themselves, nor do they present grounds for creating one in Asia based on the dollar.

Finally, I had difficulty identifying any advocates of "the three *possible* components of a yen bloc hypothesis" (emphasis mine). Presumably this straw man was created as well as shot down in Berkeley.

Comment

Sung Hee Jwa

The authors seem to have succeeded in dispelling a myth about the yen bloc so clearly and forcefully that one cannot quarrel with their conclusion in any seriously critical manner.

Frankel and Wei's main findings are: (1) compared with the dollar, the yen has had a relatively small role in exchange rate determination in the East Asian economies, and its role as an invoicing currency in trade and finance has not increased as rapidly as the share of Japanese trade within the region. Therefore, the concept of the yen bloc can not be substantiated. (2) there is no strong, convincing evidence that trade activities in the East Asian economies have been concentrated within the region and centered on Japan to a "supernatural" extent, beyond what can be explained by "normal" economic forces, such as the growth of economies in the area and short distances between them, within the context of the standard gravity model. (3) there is no genuine incentive for East Asian economies to maintain the stability of their currencies vis-à-vis the yen except to the extent that Japan happens to be their major trading partner. (4) the authors observe that it is the United States rather than Japan that wants the yen to play a larger role in East Asia. I will address each of these issues in the order they were presented.

The Role of the Yen

The rise to dominance of an international currency is analogous to that of a common language in which increasing the number of people who use the language consequently increases its utility, thereby allowing the language to assume the dominant role as a common tongue and to inhibit any newcomers

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from assuming its role. Therefore, if the yen were to emerge as the dominant currency over the dollar, it would happen discretely—as a regime change when the environment (including noneconomic aspects) ripens to support it—rather than as a gradual process. Where the proportion of yen usage in trade and finance passes a certain threshold and is large enough to exploit the inherent external effect, the yen, which now plays only a minor role, will begin to assume a disproportionately and accumulatively larger role as the dominant currency.

How high the threshold must be is a challenging question, to be resolved in future research, but one should not expect any noticeable increase in the role of the yen until the threshold is reached. Therefore, the authors' findings about the lower than expected role of the yen in exchange rate determination and as an invoicing currency should not be a surprise or a disappointment. Rather, it seems that the Japanese share in the world economy still falls short of the threshold even if the authors believe it is very high and rising substantially.

In this context, it may be interesting to compare the importance of the currencies of major economies as invoicing currencies relative to the shares of those economies in the world economy and see if the importance of the yen is disproportionately greater or less than other major currencies.

A Normal versus a Supernatural Trading Bloc in East Asia

Frankel and Wei were interested in and searched for noneconomic forces, such as historical, political, cultural, and linguistic ties, leading to a possible supernatural trading bloc in the East Asian economies but failed to find supporting evidence. However, to anyone who hopes for or worries about the economic effects of a trading bloc centered on Japan, it is the simple fact of the bloc actually being formed regardless of the events causing the bloc that is the concern. For this reason, it is also equally important to note that the authors have clearly and systematically shown the emergence of a normal or natural trading bloc among the East Asian economies, as the Japanese and other economies in the region have grown so rapidly in recent years.

In addition, their finding that no "supernatural" forces play a role in promoting a trading bloc among the East Asian economies is not at all surprising, because it seems natural to think that the East Asian region shares relatively fewer common noneconomic factors than Europe or North America. But in spite of their argument that there was no evidence that Japan had established or come to dominate a trading bloc in Asia, implicitly, indirectly, or openly, one should not be ignorant of the fact that Japan is investing a lot to improve the level of East Asian understanding of Japan, which may be conducive to forming a supernatural trading bloc in the future.

Concerning Frankel and Wei's regression equation based on the gravity model, it would be interesting to investigate whether there are any mutually enhancing and cumulative effects among the GNP or GNP per capita variable and other variables by adding cross-product terms of those variables.

Who Is Interested in a Larger Role for the Yen?

While the authors argue that it is not Japan but the United States that is interested in a larger role for the yen, it seems that this question can not be readily or easily answered. As mentioned earlier, even if Japan is eager to form and lead a trading bloc, as well as a yen bloc, and is taking action in this direction, the special Japan factor may not be visibly detected in Frankel and Wei's approach. This may be because their approach may only be applicable to continuous cases and not to the discrete case of a shift of the natural monopolist from the dollar, the existing dominant international currency, to the yen, the new competitor.