5

Estimated Effects of Trading Blocs

If there were nothing to the notion of trading blocs, then the five basic variables in the gravity equation—size, per capita income, bilateral distance, common borders, and common languages—might soak up all 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 regional or preferential trade arrangement (PTA). If this were the case—the extreme form of the Krugman-Summers claim—the observed tendency for trade to be intraregionally concentrated would be due solely to the proximity of the countries. The observed tendency for this concentration to increase—for example, in Asia—would be due solely to the region's rapid rate of overall economic growth. In this chapter, however, we find that dummy variables for intraregional trade *are* highly significant statistically. These variables do account for at least some trade between countries.

As we have already mentioned, there is a choice of whether to define a bloc as consisting of only those countries that were formal members of the PTA (when there was a PTA) during the year in question. Such a definition makes it difficult to compare results across years. Do we want the reported EC effect to decrease from one year to the next when three members join and if even though rapidly integrated into the club, they have a somewhat lower degree of trade concentration than the average of the long-standing members? Probably not. Such a definition would not capture what we think of as a growing EC effect.

We have generally opted for comparability over legal niceties. One reason for doing so is that it would not always be clear precisely in what

year specific countries joined. Typically the year that an agreement is negotiated is different from the year it is ratified, which is in turn different from the year it goes into effect, which is in turn different from the year that the transition period of trade liberalization is completed. There is a tendency for trade flows to be affected in advance of the date when the agreement goes into effect, as businesses position themselves for future markets.

Another reason for defining uniform membership of blocs over time is that some of the groups in which we are interested are possible continent-wide informal trading areas that do not (yet) constitute formal PTAs. To impose a legal date of inauguration on them would be to exclude them from consideration entirely. Nevertheless, in the case of explicit regional arrangements, we will also report the results of some estimates that carefully distinguish effects before and after the formal establishment of a PTA or the expansion in its membership.

We begin by looking at the apparent effects of formal regional trading arrangements defined by their membership in 1996. Given that these institutions either did not exist in 1965, the beginning of our sample period, or did not consist of their current membership, we do not necessarily expect to see effects early in the sample period. The aim, rather, is to see when their effects seem to take hold.

The reader is also warned from the beginning that the estimated bloc effects seem to bounce around, more so than one would expect from the variation over time in trade policies and their effects. In some cases, the results, even if surprising, are probably telling us something that we need to know. But in other cases, the fluctuations seem too great to be plausible. We take this to be the result of estimation error. This is why we also report the results of some tests that pool the time-series and cross-section observations together, which forcibly smooths out some of the variation (tables 5.1, 5.2, and 5.3).If, on the other hand, one thinks that the variation over time in estimated coefficients contains meaningful information and that the impact of formal regional trading arrangements should be identified with a particular year of implementation, then one should look for a change in the coefficient over the interval that includes that year. This is why we also report estimates of the effect of bloc formation on the change in trade.[1] Finally, we report some results for trade disaggregated by major sector.

Trading Blocs in Europe

We begin with Europe, the continent where regional trading arrangements appear to be the furthest advanced, both in terms of formal agreements and the level of intraregional trade.

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1. In taking the first difference of the equation, such variables as distance and linguistic links drop out. Probably as a result, the estimates are less precise and the effects are usually insignificant statistically when estimated in this way.

Table 5.1 Pooled estimation of explicit regional trading arrangements[a]
(dependent variable is total trade between countries *i* and *j*, 1970-92)

	Effects without openness[b]	Effects with openness[c]
GNP	0.785**	0.755**
	(0.009)	(0.010)
Per capita GNP	0.187	0.250**
	(0.011)	(0.013)
Distance	−0.612**	−0.784**
	(0.020)	(0.024)
Adjacency	0.573**	0.468**
	(0.086)	(0.088)
Language	0.568**	0.570**
	(0.046)	(0.046)
EC bloc	0.151**	−0.145*
	(0.053)	(0.059)
EFTA bloc	0.030	0.222*
	(0.104)	(0.105)
NAFTA bloc	0.005	0.359**
	(0.182)	(0.203)
Mercosur bloc	0.930**	0.707**
	(0.215)	(0.240)
Andean bloc	0.200	0.259
	(0.188)	(0.196)
ASEAN bloc	1.965**	1.318**
	(0.178)	(0.166)
East Asia (minus ASEAN) bloc	1.322**	0.638**
	(0.191)	(0.196)
Australia-New Zealand bloc	1.632**	1.554**
	(0.131)	(0.143)
EC openness		0.180**
		(0.045)
EFTA openness		−0.382**
		(0.050)
NAFTA openness		−0.195**
		(0.061)
Mercosur openness		0.259**
		(0.056)
Andean openness		0.065
		(0.053)

(continued next page)

Table 5.1 (continued)

	Effects without openness[b]	Effects with openness[c]
ASEAN openness		0.767** (0.050)
East Asia (minus ASEAN) openness		0.741** (0.052)
Australia-New Zealand openness		0.021 (0.075)
Number of observations	6,102	6,102
Adjusted R^2	0.762	0.787
Standard error of the regression	1.179	1.114

**, *, and # denote significance at the 99%, 95%, and 90% levels, respectively.

a. Data cover 1970, 1980, 1990, and 1992. All variables except dummy variables are in logs. All regressions have an intercept and year dummies not reported here.

b. Bloc variables take the value one if both countries (*i* and *j*) in the pair are in the region.

c. Openness variables take the value one if the pair includes a country in the region.

Source: Wei and Frankel (1997, table 1).

The European Union

The relevant group for Western Europe has changed frequently. We start, in table 4.2, at the level of the European Union, counting all 15 current members (as of 1996). The dummy variable represents when both members of the country pair are among the EU-15. Its coefficient is statistically insignificant during 1965-80. Only in 1985 does it attain a statistically significant level of .2, rising to .3 in 1990. The estimate suggests that in 1990, two members of the EU-15 traded only 35 percent more, after holding constant for GNP, proximity, and the other gravity variables, than two otherwise similar countries [exp(.3) = 1.35]. The somewhat weak effect could either be due to the fact that the European Union did not exist and some of the 15 were not in the precursor European Economic Community (EEC), or to the progressively more serious steps toward integration that the European Community took over time.[2]

2. The EU bloc effect becomes even weaker when we introduce terms into the equation to allow for the general level of openness of the European Union and of the other groups. These are dummy variables that are equal to 1 when at least one country of the pair in question is a member of the group (as opposed to the bloc dummy, which is equal to 1 when *both* countries are EU members). The results are reported in table 4.2, in the second column under each year. Introducing these terms deprives the EU bloc term of its statistical significance in 1965, 1985, and 1990. The implications are discussed in the next subsection.

Table 5.2 Pooled estimation of prospective trade blocs[a]
(dependent variable is total trade between countries *i* and *j*, 1970-92)

	Effects without openness	Effects with openness
Intercept	−9.355**	−9.520**
	(0.236)	(0.331)
1980 dummy	−1.030**	−1.075**
	(0.049)	(0.054)
1990 dummy	−1.323**	−1.389**
	(0.055)	(0.065)
1992 dummy	−5.278**	−5.332**
	(0.153)	(0.169)
GNP	0.762**	0.761**
	(0.009)	(0.009)
Per capita GNP	0.194**	0.214**
	(0.011)	(0.013)
Distance	−0.586**	−0.611**
	(0.021)	(0.028)
Adjacency	0.663**	0.624**
	(0.080)	(0.081)
Language	0.443**	0.517**
	(0.045)	(0.045)
Western Europe bloc	0.167**	0.120**
	(0.053)	(0.053)
East Asia bloc	0.899**	0.786**
	(0.101)	(0.102)
APEC bloc	1.147**	0.937**
	(0.063)	(0.071)
Western Hemisphere bloc	0.355**	0.637**
	(0.070)	(0.079)
Western Europe openness		0.101*
		(0.048)
East Asia openness		0.715**
		(0.056)
APEC openness		−0.276**
		(0.059)
Western Hemisphere openness		−0.082#
		(0.044)
Number of observations	6,102	6,102
Adjusted R^2	0.924	0.927
Standard error of the regression	1.137	1.114

**, *, # denote significance at the 99%, 95%, and 90% levels, respectively.

a. All variables except dummy variables are in logs. Data cover 1970, 1980, 1990, and 1992. Each openness variable takes the value one if the pair includes a country in the region.

Table 5.3 Trends in the openness of continental trade blocs[a]
(dependent variable is total trade between countries *i* and *j*, 1970-92)

	Effects without openness	Trend in coefficient	Effects with openness	Trend in coefficient
Intercept	−9.410**		−9.806**	
	(0.236)		(0.343)	
1980 dummy	−1.062**		−1.006**	
	(0.050)		(0.068)	
1990 dummy	−1.378**		−1.242**	
	(0.058)		(0.107)	
1992 dummy	−5.358**		−5.181**	
	(0.154)		(0.188)	
GNP	0.763**		0.762**	
	(0.009)		(0.009)	
Per capita GNP	0.198**		0.222**	
	(0.011)		(0.013)	
Distance	−0.585**		−0.605**	
	(0.021)		(0.028)	
Adjacency	0.667**		0.633**	
	(0.078)		(0.079)	
Language	0.445**		0.519**	
	(0.045)		(0.044)	
Western Europe bloc	0.236**	−0.006	0.117	−0.001
	(0.072)	(0.004)	(0.078)	(0.004)
East Asia bloc	1.360**	−0.032*	1.360**	−0.040
	(0.226)	(0.013)	(0.226)	(0.013)
APEC bloc	0.841**	0.021**	0.824**	0.006
	(0.134)	(0.008)	(0.146)	(0.008)
Western Hemisphere bloc	−0.237*	0.045**	0.021	0.047**
	(0.099)	(0.007)	(0.116)	(0.008)
Western Europe openness			0.303**	−0.016**
			(0.075)	(0.004)
East Asia openness			0.363**	0.026**
			(0.106)	(0.006)
APEC openness			−0.079	−0.016**
			(0.089)	(0.005)
Western Hemisphere openness			−0.014	−0.006
			(0.072)	(0.004)
Number of observations		6,102		6,102
Adjusted R^2		0.924		0.928
Standard error of the regression		1.133		1.107

**,*, # denotes significance at the 99%, 95%, and 90% levels respectively.

a. All variables except dummy variables are in logs. Data cover years 1970, 1980, 1990, and 1992. Each openness variable takes the value one if the pair includes a country in the region. Columns 3 and 5 are coefficients (standard errors) for the interaction between the variables in column 1 and a trend (defined as: year-1970)

European Community

We have also tested for the membership of the European Community and the European Free Trade Association (EFTA) as they stood at the end of the 1980s. There is an upward trend in the EC coefficient. As recently as 1980, the EC bloc effect was not statistically significant in most of our results. Only in 1985, 1990, and 1991 does the EC bloc effect generally become highly significant (Frankel 1993, 1994; Frankel and Wei 1994a, 1995a, 1995b).[3] In some specifications, the EC effect becomes significant as early as 1980, but rarely earlier than that (Frankel and Wei 1994b, 1995c; Frankel, Wei, and Stein 1995).

A typical coefficient estimate for 1990, when the European Community actually comprised all 12 of the members that we attribute to it, is .5. This point estimate suggests that two EC members traded an extra 65 percent, relative to two otherwise-similar countries.[4] If the data from four years—1970, 1980, 1990, and 1992—are pooled together, the estimated coefficient on the European Community is a smaller .15, implying a 16 percent effect (table 5.1).

When we introduce a term to capture groups' general levels of openness, we find that the members of the EC-12 are more open than one would expect from the gravity determinants. In 1980 and 1985, for example, a typical estimate of the openness coefficient is a highly significant .4, indicating that an EC member traded about 50 percent more with all partners than did two otherwise-similar countries.[5] When one takes into account this greater tendency for EC members to trade with all partners, the tendency to trade with fellow EC members is slightly less pronounced. Indeed, when the years 1970-92 are pooled together, thus constraining the EC bloc effect to be constant throughout, the introduction of the openness term changes a significantly positive bloc effect into a negative one (appendix table B5.1; Frankel and Wei 1996, 1997). Still, the EC bloc effect is usually significant in 1980 and thereafter.[6]

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3. The EC bloc coefficient, highly significant in 1985 and 1990, can also be seen in table B6.7b.

4. That is, exp(.5) = 1.65. This estimate can be obtained either from Frankel and Wei (1994a, table 12.13 or 1995a, table 3), which do not allow for the effect of linguistic links, or Frankel and Wei (1995b, table 1), which does have a dummy variable for common language. If one allows the English language to have a different effect from Spanish, Chinese, Arabic, and French, the difference is positive and significant. In that case, the estimated EC bloc effect is lower in 1990 but higher in 1985 (Frankel and Wei 1995c, table 2).

5. The openness effect is particularly clear in the case of manufactured products (Frankel and Wei 1995c, tables 2 and 3; Frankel, Wei, and Stein 1995, tables 2, 4, and 4a).

6. Results are reported, for example, in appendix table B6.6 for 1980, Frankel and Wei (1995c, table 2) for 1985, and appendix tables B5.4a and B5.4b, with incomes measured either as GNPs on an exchange rate basis or as GDPs on a PPP basis, respectively, for 1991.

Clearly, the EC-12 effect is not constant over the sample period. Accordingly, as promised, we now depart from our usual practice of keeping the definitions of the group unchanged over time, to study the effects of the expansion of the EEC-6 into the EEC-9 in 1973 (the accession of the United Kingdom, Ireland, and Denmark) and the expansion into the EC-12 during 1981-86 (the accession of Greece, Spain, and Portugal). We are looking here for an effect expressed in terms of *changes* in bilateral trade flows. Therefore, we take the first difference of the gravity equation. Distance and the border and language dummies drop out, as they do not change over time, and we are left with the GNP variables. The results are reported in Wei and Frankel (1995b, table 1). They show that both expansions of EC membership increased trade between the existing members and the new members. In each case, the point estimate is .3: trade between the existing EC members and the newcomers expanded about 30 percent over the appropriate five-year interval. The effects of the first expansion are not at all significant statistically, however. The coefficient on the second expansion, estimated at .3, is significant only at the 80 percent confidence level.[7]

To summarize the results on EC trade so far, it appears that, despite the high level of intra-EC trade in the 1960s and 1970s that shows up in measures such as trade shares (table 2.1 and figure 2.1a), most of this trade can be explained by the EC members' size, level of development, proximity, common borders, and common languages. There is little intra-EC trade left over, after correcting for these influences, to be attributed to the effect of the regional trading arrangement itself, until the 1980s. One possibility, which we will consider in the next chapter, is that the stabilization of bilateral exchange rates in the 1980s, under the Exchange Rate Mechanism of the European Monetary System, might be in part responsible for the promotion of intra-European trade after 1979, but not before. The more likely explanation, however, is simply that half of the 12 were not members in 1965 and 1970.

Most of our statistical results are based on data for merchandise trade in the aggregate. We have not analyzed trade in services because comprehensive bilateral data are not available. We have, however, tried some disaggregation of merchandise trade, estimating separate equations for trade in manufactures, trade in agricultural products, and trade in other raw materials (for 1965-85). In the case of Europe, this level of disaggregation appears to sharpen the tests. Whereas the EC bloc effect did not turn positive until 1980 and did not become significant until 1985, when

7. This is also the technique used by Bayoumi and Eichengreen (1995). They find significant effects from both the European Community and EFTA. However, they do not include developing countries in their sample.

estimated on aggregate merchandise data, it in fact is positive throughout[8] and turns highly significant in 1980, when estimated on manufactures alone.[9] The estimated effect for 1980 is about .5: two EC members engaged in about 65 percent more manufactures trade with each other than two otherwise-similar countries.

The EC bloc effect is even stronger when estimated on agricultural products alone: it is highly significant in every year, with an upward trend. The point estimate in 1985 is 1.4, indicating that two members of the EC-12 trade in agricultural products four times as much as two otherwise-similar countries (Frankel, Wei, and Stein 1995, table 4b; Frankel, Stein, and Wei 1994, table 2).[10] (The data were not available for 1990 or 1992.) Needless to say, this strong result is the outcome of the interventionist Common Agricultural Policy, which one would not wish to describe as the operations of a free market, even with the usual caveats about trade diversion from outsiders.

The bloc effect for nonagricultural raw materials turns positive in 1975, significantly so in 1980 and thereafter (Frankel, Stein, and Wei 1994, table 2).[11]

The decision to adopt a high level of aggregation in most of this book is deliberate. There are many other thorough statistical studies of the

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8. In 1965, the estimate is .6, and is even significant at the 99 percent confidence level, when not holding constant for the general openness of EC countries. The estimate is .3 and significant at the 90 percent confidence level when holding constant for openness (results reported in Frankel, Stein, and Wei 1994, table 3b; Frankel, Wei, and Stein 1995, table 4a, respectively). They omit the common-languages term in the equations.

9. The European Community loses a little of its bloc effect in manufactures when holding constant for linguistic links (in particularly, the highly significant effect of the English language) but is still positive more consistently than when estimated for aggregate merchandise trade. This comparison holds especially if one is not attempting to hold constant for significant EC openness, but also holds even if one does so. The results with linguistic links are reported in Frankel, Stein, and Wei (1994, table 5) and Frankel and Wei (1995c, table 3), respectively.

10. Smeets (1994) had a similar finding in his study of Germany's bilateral trade: agriculture was one of only two sectors (along with chemicals) out of ten sectors that showed a significant EC bloc effect as far back as 1978. There was no significant EC effect in manufactures, which constituted 67 percent of Germany's trade.

11. Even when the effect is statistically significant within each of the three component categories, it does not necessarily follow that it will appear statistically significant when estimated in aggregate form. The technical econometric problem is aggregation bias: if the equation is seriously misspecified when estimated in aggregate form, because in reality the coefficients differ by commodity, then (technically) all bets are off. Is this a problem that we should worry about? On the one hand, the fact that most of the coefficient estimates are similar for the three components of trade should help the aggregation. On the other hand, the estimated coefficients for GNP per capita and distance tend to be lower for the gravity equation estimated on agricultural products, as compared with the case of manufactures. This heterogeneity alone is capable of invalidating the aggregation.

effects of integration in Europe and elsewhere carried out on a disaggregated basis. We wish in this book to be able, in the end, to think in terms of an overall degree of regionalization, without having to choose how to aggregate over different degrees of regionalization estimated within hundreds of individual sectors. Nevertheless, the important point for the moment is that the high level of aggregation can lead us astray. In particular, the regionalization of trade in manufactures among the EC-12 had become highly significant statistically by 1980, even though the tests run on aggregate merchandise trade data make it look like this did not happen until 1985.

European Free Trade Association (EFTA)

We have seldom found EFTA to be a statistically significant bloc (Frankel, Stein, and Wei 1995; Frankel and Wei 1993b, 1995a, 1995c, 1996; Frankel, Wei, and Stein 1995; Eichengreen and Frankel 1995, table 2). The sole exception, where EFTA shows a coefficient of .2 that is statistically significant at the 95 percent level, comes in the case where data are pooled from 1970, 1980, 1990, and 1992 and where one at the same time allows for the tendency of EFTA countries to trade less with outsiders (Frankel and Wei 1997). The finding that EFTA countries are less open than predicted by the equation appears repeatedly, but in most cases the presence of the openness terms does not make the EFTA bloc effect statistically significant.

Here again, some disaggregation of trade by sector may be helpful. EFTA applied primarily to manufactured goods. When the equation is estimated on trade in manufactures, the EFTA bloc coefficient is usually positive, is of borderline significance in 1975, and is highly significant in 1980. That is only one or two years out of five, however. The same is true for trade in agricultural products and other raw materials, except that here there are clear, monotonic upward trends in the coefficients over time. By 1985, the bloc effect in farm products reaches a highly significant 1.1: the estimated effect on intra-EFTA trade in this sector is 2.9 times (Frankel and Wei 1995c, table 3; Frankel, Stein, and Wei 1994, table 2; Frankel, Wei, and Stein 1995, tables 4a and 4b).

Western Europe

Next we consider Western Europe as a whole. We find that either the European Community or Western Europe is significant when considered by itself. But the true test comes when both are included simultaneously. Here, it is clear that the European Community is the correct grouping: the Western Europe bloc is insignificant alongside it.[12]

12. Grant, Papadakis, and Richardson (1993, 53) observe that intraregional trade is greater in Western Europe than in the European Community. Based on this and similar statistics for other groups, they conclude that ''trade indeed follows the flag,'' i.e., that political

Still, if we are looking toward a potential future world in which all of Western Europe might become one trading bloc, rather than looking at the past, aggregate continental estimates such as those in table 4.3 might be of interest. Here we see that by 1990, the Western Europe bloc coefficient had reached a highly significant .4, indicating that two Western European countries trade 49 percent more than two otherwise-similar countries. Unfortunately, this coefficient bounces around more than seems reasonable. In table 5.2, we pool the four observation years during 1970-92 together and impose the constraint that the Western European bloc effect is constant throughout; the estimated coefficient is .2. We allow for a time trend in the coefficient, but the coefficient in the table shows little trend.

When we introduce the openness term for Western Europe (table 4.3), it shows up significant and positive in 1980 and 1985, though mostly insignificant in the other years. In the pooled estimates for 1970-92, the openness is significant and positive. Evidently the openness of the EC-12 dominates the closedness of the EFTA-5 (Frankel and Wei 1995a, tables 1 and 2; Frankel and Wei 1995d). Taking into account the general openness of Western European countries reduces the estimate of the tendency for these countries to concentrate their trade with each other.

European Bloc Effects Estimated by Others

Perhaps the most common use of the gravity model by other authors in the 1970s and 1980s was precisely to evaluate the effects on trade of the establishment of the European Economic Community and its subsequent expansion. Their results often show significant evidence of the hypothesized effects of the EEC and EFTA, such as the study of 1967 trade by Aitken (1973). In Bergstrand's (1985) results, the European Community and EFTA were estimated to raise intragroup trade during 1965-76, but only the EEC effect was consistently significant in the preferred general form of the equation.[13]

Those studies used data on trade among European or industrialized countries only, excluding trade among most non-European countries. Even when one is interested only in the question of European trading arrangements, it helps to have data on other trade as a standard of comparison. Trade among 20 European countries gives only 190 data points ($20 \times 19/2$). If one expands the number of countries even by a factor of 2, the number of observations goes up with the square, to 780 ($40 \times 39/2$).

affinities may be more important than formal regional trading arrangements. Our findings suggest that this is an example of how one can be misled by relying on intraregional trade shares, unadjusted for country size (also, e.g., from Frankel and Wei 1995a).

13. Hewett (1976) estimated the EFTA effect at 6, and the EC effect at 4. Bayoumi and Eichengreen (1995) found significant effects of the expansions of the European Community in 1972, 1981, and 1986.

Brada and Mendez (1983) extend the sample to include some developing countries, for a total number of 46 countries, during 1954-77. They find that the European Community raised internal trade by a factor of 5 and EFTA by a factor of 4. Smeets (1994) found for 1978 a significant EC effect in most sectors, when considering Germany's trade with the original EC-6 alone, but did not when the three newcomers were included in the definition of the European Community. Hamilton and Winters (1992), as we do, find the EC-12 significant for the mid-1980s (1984-86).

These studies did not hold constant for common languages or, in some cases, for common borders, so it is possible that a bit of these effects were picked up by the FTA variables.

Some readers have found surprising our result that intra-European trade can be mostly explained by the various natural factors, with little role for the European Community until the 1980s (with the exception of agricultural trade, where we find the EC effect to be highly significant throughout). As noted, the most likely explanation is that the membership of the EC-12 was not complete until the mid-1980s. But it is worth noting that some others have gotten negative results even with the narrower definitions of membership. Bergstrand (1985), as we do, finds the EC effect insignificant in 1976. Bikker (1987, 330) gets the surprising result that intra-EEC trade in 1974 was less than would be predicted by the gravity equation, though the intrabloc term had increased relative to 1959.[14] Similarly, Boisso and Ferrantino (1996) find that trade among EEC members was actually significantly less than would be predicted in the 1950s, 1960s, and 1970s. The negative term steadily erodes, so that by 1986 the EEC has attained neutrality. They attribute to the formation and expansion of the EEC the European countries' progressive relinquishment of their apparent initial reluctance to trade with each other. To the extent that one's impression of a large effect before the 1980s is based on calculations of simple intraregional shares that do not adjust for these other factors,[15] the answers from the gravity approach are probably more reliable.

Regarding EFTA, Boisso and Ferrantino (1996) find a moderate bloc effect but only for 1966-72. They, like us, show no significant effect on aggregate merchandise trade in the 1980s. (Where our tests look only every five years during 1965-90, theirs are year by year.) Hamilton and Winters (1992) also find EFTA insignificant for the one period that they estimate (1984-86).

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14. Nitsch (1993) obtains a negative EC bloc effect as recently as 1990.

15. For example, Wonnacott and Lutz (1989, 76) show increases in intraregional trade that they attribute to the expansion of the European Community and EFTA.

EC Preferences

We have not studied patterns in trade between Western European countries and developing-country beneficiaries of EC preferences or Eastern European countries. But we can report here some findings by others. In a study of 1976 data, Oguledo and MacPhee (1994) find a significant positive effect of the Lome preferences on LDC trade with the European Community and 10 other industrialized countries.[16] Hamilton and Winters (1992) also find significant effects for the Lome preferences.

Eastern Europe

Needless to say, trade among Eastern European countries was until recently artificially diverted away from Western partners and toward trade among themselves and the Soviet Union (e.g., Holzman 1985). In a gravity equation, Hewett (1976) estimated a coefficient on intra-CMEA trade of 2.6. Biessen (1991) found in a study of bilateral trade among seven Eastern European countries and 15 Western European countries that trade between the CMEA and the West had been depressed far below what would be normal. Once this factor was taken into account, the independent effects of trade undertaken by centrally planned economies, trade within the CMEA, and even trade within the European Community or EFTA were not statistically significant.

One of the most important uses of the gravity model is to project the natural pattern of trade that would hold if artificial political barriers were removed. Havrylyshyn and Pritchett (1991), Wang and Winters (1991), Hamilton and Winters (1992), Winters and Wang (1994), and Baldwin (1994) all have used the gravity model to predict the normal pattern of trade to which the Eastern European countries could be expected to return after the end of the Cold War.[17]

We have used the gravity equation to estimate significant 1980 coefficients of −.97 for Hungary, −.98 for Poland, and −.41 for Yugoslavia. These coefficients can be interpreted as the trade-inhibiting effects of Soviet-style economics, which should disappear with the breakup of the Soviet system.

Apparently, such predictions are indeed rapidly coming true. Even by 1990, Hungary, Poland, and Yugoslavia show improved openness coefficients in our estimates. Schumacher (1996) finds in 1992 data that

16. They also find a negative effect that is apparently very highly significant for the Generalized System of Preferences. These results are probably tainted by failure to allow for the fact that poor countries trade less, even after allowing for tariff levels, which they do.

17. Collins and Rodrik (1991) and Brown et al. (1996) also forecast trade between these countries and the West.

Germany's trade with the Central and Eastern European countries and the former Soviet Union has already reached the levels implied by the gravity model. In other words, the negative openness terms have disappeared. Vittas and Mauro (1996) find that, unlike Germany, five other Western European countries still have a ways to go (a 64 percent gap, on average) before experiencing the full predicted share of trade with Central and Eastern European countries.

TAFTA

Even less in operation during the sample period than the European Union is the Trans-Atlantic Free Trade Agreement (TAFTA), which was only a gleam in the eye of some Western leaders as of 1995. There was, however, sufficient interest in the TAFTA proposal in 1995 to call for a test of the effect of this grouping. We defined a potential TAFTA bloc as including all 15 EU members plus all three members of the North American Free Trade Agreement (NAFTA; see estimates in table 4.3). The coefficient is always negative. It even appears to be statistically significant in many years. In 1992, the coefficient is a significant $-.3$, indicating that any two North Atlantic countries trade 35 percent less than one would expect given their GNPs and other gravity variables.

For boosters of TAFTA, of which the author does not count himself one, this finding need not be interpreted pessimistically. The negative trans-Atlantic effect means that trade among these countries is less than its true potential. Perhaps the United States has been overly distracted by its relations in the Asia Pacific Economic Cooperation forum (APEC) or the Western Hemisphere, and the European Union by its own regional trading arrangements. In any case, current trans-Atlantic trade falls significantly short of the high ''natural'' level of trade that is justified by incomes and geography. So, one could argue, a TAFTA is needed to correct the situation.

A dummy variable for general openness of TAFTA members reveals no effect. (The term is collinear with the term for openness of Western Europe.) The introduction of openness terms for all the regions, nevertheless, eliminates the statistical significance of the negative trans-Atlantic bloc effect. The bottom line is that there is no evidence of a TAFTA bloc.

Trading Blocs in the Western Hemisphere

We now turn to the Americas. As before we begin with the existing formal FTAs. There are three large ones in the Western Hemisphere, comprising, respectively, North America, South America east of the Andes, and the western part of South America. In no other part of the world has there

been such a dramatic, recent shift in the direction of successful preferential trade arrangements.

We begin by considering dummy variables for the three important subregions: NAFTA, Mercosur, and the Andean Pact. Tight standard errors and significant coefficients are not to be expected in light of the small number of observations: three ($3\times2/2$) for NAFTA, six ($4\times3/2$) for Mercosur, and ten ($5\times4/2$) for the Andean Pact. (Pooling across time should help a bit, to the extent one is willing to view the structure as constant and the observations as independent.) But the point estimates are in any case of interest, as these are the groups with explicit trade preferences.

We have also tried dropping the individual regional free trade areas (FTAs) in Latin America, instead adding one dummy variable to indicate whenever a pair of countries belongs to the same PTA or FTA, regardless of which one it is, and another to indicate whenever the pair belongs to the same customs union or common market (Frankel, Stein, and Wei 1994, tables 4 and 4a).[18] This constrains all PTA/FTAs to have the same effect on bilateral trade, and analogously for all customs unions. The PTA/FTA variable is often statistically significant, particularly when the tests are run on manufacturing products alone. The customs union/common market variable is not. It is probably better not to constrain such disparate agreements to have the same effects, and so we do not explore this specification any further here.

NAFTA and the Canada-US FTA

In table 4.2, the coefficient for a North American bloc is almost never significant, not even in 1992, when NAFTA was actually negotiated. The lack of significance could be due in part to the small number of observations: there are only three pairs of countries in NAFTA. The only exception is when data are pooled over 1970-92 (and one allows for a significant negative openness term, which we may call a trade-diversion effect). Then the estimated coefficient on the NAFTA bloc is a significant .36, implying a 43 percent effect on intra-NAFTA trade ([1.43 = exp(.36)]; see Frankel and Wei 1997, table 1).[19]

A test for a specific Canadian-US effect yields an insignificant result (Frankel and Wei 1996). The outcome is the same when the test is run on the change in trade between 1985 and 1990. (Recall that the Canada-US FTA was signed in 1988.)

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18. Recall the distinction that under customs unions, external tariffs are made uniform, while under FTAs countries retain their individual external tariffs.

19. In Frankel, Wei, and Stein (1995, table 4), however, a negative openness effect for North America (often significant) does not produce a positive NAFTA bloc effect.

We found in the previous section that estimates could in some cases be sharpened by disaggregating merchandise trade into manufactures, agricultural products, and other raw materials. In the case of North America, this disaggregation does not make much difference.[20] The small number of observations is probably the greatest problem with the estimates. A bilateral relationship, after all, offers only one observation per year. This does not reflect adversely on the efficacy of the Canada-US Free Trade Agreement or NAFTA. The problem may simply be that we do not have enough data to address the question. This is certainly true in the case of NAFTA, where the time elapsed since the 1994 implementation is insufficient to allow the drawing of reliable conclusions, regardless of the statistical methodology (Hinojosa-Ojeda et al. 1996 offer an early assessment).

Clausing (1995), however, does have enough data in the case of the Canada-US FTA. Like us, she finds no statistically significant impact on trade between the two neighbors after 1988 when using a gravity model on aggregate merchandise trade, despite the fact that all her tests use data that go up to 1993. But then she focuses on a data set of thousands of goods, disaggregated into a six-digit level of classification. At this level of disaggregation, one can use direct information on how high tariffs were before the agreement and how quickly they are being phased out under the agreement. (The use of this disaggregated data to study international trade is made possible by a Harmonized Classification system adopted by the US and Canadian authorities. This would not be possible for other pairs of countries, as different countries have different classification schemes.)

The tariff reductions had highly significant effects on Canada-US trade during the first five years of the agreement. The boost to trade was significantly greater in commodities that were subject to high tariffs before 1988 than those subject to low tariffs. The effects are about twice as great in the long run as in the short run. Clausing estimates that each 1 percent cumulative reduction in Canadian tariffs is associated with imports from the United States in 1993 that are 6 percent higher than they would otherwise be. Each 1 percent cumulative reduction in US tariffs is associated with imports from Canada in 1993 that are 12 percent higher than they would otherwise be. Using five-year elasticities and multiplying by the actual (trade-weighted) reduction in tariffs in the two countries under the agreement, she obtains estimates for the overall impact of the FTA on trade. The implied boost to northbound trade was 18 percent, as

20. In the case of agricultural trade, there is an upward trend in the point estimates of the NAFTA bloc effects, but only in 1980 is it statistically significant. Given that the important formal agreements took place in 1988 and 1992, one should perhaps in any case not expect anything out of a data set that ends in the mid-1980s. The results are reported in Frankel, Wei, and Stein (1995, tables 4a and b).

of 1993, and to southbound trade, 16 percent. In both cases, this was substantially less than the actual increase in trade over this period. Overall, the estimated increase in trade that can be attributed directly to the FTA was a little more than half of the actual increase in trade. Much of the rest is presumably due to the increases in incomes in the two countries over the period (and to other elements of the gradual worldwide increase in trade).

One moral of this exercise is that one cannot simply look at the actual increase in trade over the period and attribute it to an agreement. This is another illustration of the importance of adjusting for other determinants, such as income, and supports our methodological approach. Another moral, however, is that some effects of regional trading arrangements are lost in tests like ours on highly aggregated data. The problem is particularly severe in a context, such as the Canada-US FTA, where the small number of observations in the case of aggregated data is a constraint. But Clausing's finding that the effects differ widely, depending in particular on the initial level of tariffs and the speed of the phase-out, also illustrates the deeper perils of aggregation.

Mercosur

There is a clear upward trend in the bloc effect for Mercosur. The coefficient is not significant during 1965-75. It becomes higher and statistically significant thereafter, particularly in 1990. In that year it reaches a highly significant 1.9. This is the strongest bloc effect estimated anywhere. It implies that the member countries—Argentina, Brazil, Paraguay, and Uruguay—trade among themselves almost seven times as much as otherwise-similar countries. (Chile is excluded from the membership, as is appropriate for this period.) This is another good example of how the gravity equation can give very different answers than the simple intraregional trade shares in table 2.1. Intraregional trade among the Mercosur countries looked low and slow-growing, by that measure. But when one takes into account the fact that the countries constitute a small fraction of gross world product and that they did not grow very rapidly in the 1980s, their intraregional trade looks far more impressive.

A variable for trade between Mercosur and nonmember countries shows a monotonically increasing coefficient. It starts out with a highly significant coefficient in 1965 of $-.2$ or $-.3$ and rises to a highly significant coefficient of $+.8$ or $+.9$ in 1990.[21] This clearly reflects the shift in thinking over time—from import-substitution philosophy to the gospel of the marketplace—in the geographical epicenter of that shift. The recognition of

21. In addition to table 4.2 here, see Frankel, Wei, and Stein (1995, table 4).

a greater propensity to trade in 1985 and 1990 knocks down the estimated Mercosur bloc effect a little, but it remains statistically significant.

When the 1970-92 data are pooled, the Mercosur coefficient is a highly significant .93 (or .71, if one allows for the significant openness effect). This is an effect on trade of 2.5 times (2.5 = exp(.93); Frankel and Wei 1997, table 1).[22] Mercosur is another case where a bit of disaggregation seems to help. The bloc effects are even stronger in 1980 and 1985 when the equation is estimated on manufactures alone, and stronger still when estimated on agricultural products alone, than when estimated on all merchandise trade in the aggregate (Frankel, Wei, and Stein 1995, tables 4, 4a, and 4b).

Our results for Mercosur are consistent with those of Abreu and Bevilaqua (1995, 26), who find a very highly significant increase in intra-Mercosur trade in 1991-94.[23]

The Andean Group

Perhaps the most dramatic turnaround occurs in the countries of the Andes. (The membership of this group excludes Chile and includes Venezuela). Despite the establishment of the Andean Pact in the 1960s, our estimated coefficient for 1965 is a highly significant −1.3, meaning that these countries actually traded with each other only one-quarter as much as they should have [exp(−1.3) = .27]. The coefficient becomes insignificant, then turns positive, and in 1992—after the reinvigoration of the Andean Pact—it suddenly attains a highly significant 1.0: the Andean countries trade 2.7 times as much as otherwise-similar countries.

An Andean openness term shows a fluctuating and insignificant coefficient (table 4.2). In other estimates it has exhibited an upward tendency suggestive of the aforementioned spread of the liberalization gospel in South America toward the end of the 1980s (Frankel and Wei 1996, 1997; Frankel, Wei, and Stein 1995, table 4). The openness terms have little effect on the Andean bloc effect, which remains large, significant, and negative at the beginning of the sample period, 1965, and large, significant, and positive at the end of the sample period, 1992. Disaggregation helps a little. The bloc coefficient in 1985, for example, becomes statistically significant when tested on manufactures alone (Frankel, Wei, and Stein 1995, table 4a).

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22. Given the evolution in South American attitudes toward trade over this period, however, one should probably not take this pooling too seriously, as it imposes an unchanging structure of trade.

23. They estimate a doubling attributable to Mercosur after 1990 [2 = exp(.72)]. Amjadi, Winters, and Yeats (1995, 17) also find, using intensity coefficients, a very rapid 1991-93 increase in Argentina and Brazil's trade within Mercosur.

When the 1970-92 data are pooled, the bloc effect is insignificant. Clearly, one does not want to mix the 1960s and 1970s, when the effect was if anything negative, with the later years. A test for the effect of the reinvigoration of the Andean Pact in 1990 on the change in trade among the members produces a point estimate of .1.

Other authors tend to find results weaker than ours. Brada and Mendez (1985) find that the Andean Pact misses being significant, with a point estimate implying a bloc effect of 1.3. Boisso and Ferrantino (1996) find neutrality for the Andean Pact overall; the coefficient is insignificantly positive, except for a significant bloc effect in 1971-76. Hamilton and Winters (1992) also find the Andean Pact insignificant for the period tested (1985-86).

Central American Common Market and Caribbean FTA

We do not have Central American or Caribbean countries in our sample. Some relevant gravity equation results are available from others, however. Brada and Mendez (1985) find a significant effect of the Central American Common Market (CACM)—a factor of 4. Primo Braga, Safadi, and Yeats (1994) also find that CACM is statistically significant and positive. Boisso and Ferrantino (1996) find a strong positive bloc effect for Central America going as far back as 1961, the first year tested. The bloc effect began a steady decline in 1969, however, until it abruptly lost all significance in 1988. The authors attribute this negative trend to the political conflicts of the 1970s and 1980s in Central America and to an ineffective CACM agreement.

Boisso and Ferrantino find a strong positive bloc effect for the Caribbean FTA, going as far back as 1973, the first year tested. It has no tendency to increase thereafter, however, from which they infer that the Caribbean FTA agreement itself has had no effects at all.

The Free Trade Area of the Americas

Next we consider a potential bloc at the level of the entire Western Hemisphere. There does exist a protoregional trading arrangement, the Free Trade Area of the Americas (FTAA), which the region's leaders agreed to form in Miami in December 1994. Thus we could call this bloc an FTAA effect. But even in 1997, a hemispheric FTA is a long way from fruition. (The target date is 2005.) It certainly would be stretching things to argue that the businesspeople of the Americas could have foreseen the FTAA in the 1970s and 1980s and acted in anticipation of it during our sample period (except, conceivably in 1992, our last year of data; President Bush had proposed the Enterprise for the Americas Initiative two years earlier, and NAFTA had been negotiated by then.)

Thus we consider the Western Hemisphere effect on a par with the Western Europe and East Asia effects. They are of interest when we consider the question of whether there is a trend toward a world of three major continental trading blocs, centered on the United States, Germany, and Japan, respectively. For this question, one need not have in mind only formal preferential trade arrangements. Such institutions as the Monroe Doctrine, the Organization of American States, and the Alliance for Progress are tangible evidence, if any is needed, that the United States has long exercised a degree of hegemony over its part of the world. More abstractly, one of the questions we will consider in chapters 8 and 9 is the hypothetical welfare effects if the world broke up into three symmetric blocs. We will need statistical estimates to help pin down some parameter values. Clearly, we want the Americas to be one of those three blocs.

There is an upward trend in the Western Hemisphere bloc coefficient (table 4.3). It actually starts out at a statistically significant -0.3 in 1965. This reflects the general lack of openness on the part of the Latin American countries during the heyday of import substitution. (The negative bloc effect loses its statistical significance when one allows a dummy variable to reflect the lack of openness of the countries in the region.[24]) But the bloc coefficient turns positive in 1975, and significantly so in 1980. By 1990 the coefficient becomes a highly significant .8, indicating a boost to intraregional trade by a factor of 2.2. The pattern here—intraregional biases that are small or even negative in the 1960s, becoming positive and significant in the 1980s—mirrors the results that we got for Mercosur and the Andean Group.[25] When one allows for the low level of openness, the bloc coefficient registers .7 in 1991 (appendix table B5.4a) and .8 in 1992.

When the data from 1970 to 1992 are pooled (table 5.2), the Americas bloc coefficient is a highly significant .4, an effect of 49 percent. When we allow for a below-average level of openness in the region, the bloc coefficient rises to .6. When we allow for a linear trend in the bloc coefficient,

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24. Surprisingly, the lack of openness appears to continue right up to 1992 in the table. The finding of a negative openness effect in the Western Hemisphere, or even one that worsens over time, is repeated in Frankel and Wei (1997) and Frankel, Wei, and Stein (1995, table 2). Evidently, the North American countries, which exhibit less openness than predicted by the gravity variables, dominate the South American countries, which toward the end of the sample period exhibit more openness than would be predicted. In Frankel and Wei (1995c, table 2), on the other hand, one gets a result that is more consistent with what one expects: the Western Hemisphere term has a strong upward trend, from a highly significant -.3 in 1965 to a significant $+.2$ in 1990. In those estimates, the Americas bloc effect remains significant in four out of six observations.

25. Other estimates show significant coefficients as high as 1.2 in 1990—for example, Frankel and Wei (1995c, table 2), which also shows a strong effect for the English language and a Western Hemisphere openness term that becomes significantly positive in 1985 and 1990.

it comes out positive and highly significant, as we would expect from looking at the year-by-year results.[26]

Disaggregation of trade by sector reveals that the bloc effect is stronger and more consistent in manufactures trade than in farm products or other raw materials. The effect in manufactures looks particularly strong when one allows for the fact that Western Hemisphere countries have been in general less open than the average, but does not allow for common languages (Frankel, Stein, and Wei 1994, tables 2 and 5; Frankel and Wei 1995c, table 3).[27]

Other authors' gravity results that are most relevant here pertain to the two historical attempts at comprehensive trading arrangements in the Latin American region. Brada and Mendez (1985) find that pairs of Latin American Free Trade Area (LAFTA) countries in fact had significantly less trade than other pairs of countries. Hamilton and Winters (1992) find the Latin American Integration Association (LAIA) significant (1985-86), while Primo Braga, Safadi, and Yeats (1994) find LAFTA is not statistically significant. Boisso and Ferrantino (1996) find a negative bloc effect for LAFTA that has turned positive over time. Thus earlier results tend to match our finding that the Western Hemisphere bloc effect was zero or negative in the 1960s and 1970s and turned positive in the 1980s.

Trading Blocs in East Asia and the Pacific

As we have noted before, formal regional trading arrangements are less developed in the Asia-Pacific region than in Europe or the Americas. Only the FTA between Australia and New Zealand is truly well-advanced, though the Association of Southeast Asian Nations (ASEAN) is beginning to get serious about trade arrangements as well.

Australia-New Zealand Closer Economic Relationship

Table 4.2 shows the bilateral Closer Economic Relationship (CER) as being highly significant statistically in every year tested. It has a slight upward trend, reaching 1.7 in 1990 and 1992. This estimate says that the antipodean pair trade 5.5 times as much as an otherwise-similar pair of countries. The openness term shows that trade by Australia and New Zealand with other partners is consistently low, and significantly so in 1980 and 1990.

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26. Similar levels and trends in the Western Hemisphere bloc coefficient are evident in Frankel (1993, 1994), Frankel and Wei (1994b, 1995b), and Frankel, Stein, and Wei (1994, 1996).

27. Allowing for linguistic links reduces the Americas bloc effect a bit in manufactures, although the effect for Spanish is no higher than for other languages.

The openness term has no discernible impact on the bloc coefficient, however.

When 1970, 1980, 1990, and 1992 data are pooled, the coefficient is 1.6 (Frankel and Wei 1997, table 1). We have dated the cementing of the CER as having taken place in 1983. The test of the effect on the change in Australia-New Zealand trade between 1980 and 1985 shows a point estimate that is close to zero. As with the other FTAs tested, it appears that too much information is lost when distance and the other unchanging variables are dropped out. As we have noted, the significance problem is especially compounded in the case of a bilateral agreement, where there is only one data point available.

ASEAN

Many studies of ASEAN have reported that trade creation is small, but these conclusions generally seem not to take into account the incomes of the ASEAN countries.[28] ASEAN, alone among the six contemporary FTAs considered, has a statistically significant apparent intraregional bias in every year tested between 1965 and 1992 (table 4.2). The coefficient estimate in 1992 is 1.8, which also happens to be close to the mean, median, and mode of the yearly estimates. Two ASEAN countries trade six times more than two otherwise-similar countries.

We know that Singapore plays an entrepot role: its imports and exports are each more than 100 percent of GNP, reflecting in part transshipments. It is possible that the apparent intra-ASEAN bias is partly or wholly a reflection of the extreme openness of Singapore. To examine this, we have tried adding a Singapore dummy to the regression, representing any bilateral trade involving the city-state. The Singapore dummy does indeed have a positive and very significant coefficient (1.51). The coefficient on the ASEAN dummy is reduced to 1.40 but remains quantitatively large and statistically significant. This suggests that Singapore's extreme openness does not explain all of the apparent inward bias among the ASEAN countries (Frankel and Wei 1995d).

The effect in each year is reduced a little more if one allows for the fact that the entire group of ASEAN countries, not just Singapore, is more open than are typical countries at their stage of development. But the coefficient is still in every year highly significant statistically, equaling 1.1 in 1992. These findings—that ASEAN countries are significantly more open than predicted by the gravity determinants, but that allowing for this openness only reduces the strong estimated bloc effect by a little—are confirmed in other tests as well (Frankel and Wei 1996, 1997).

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28. DeRosa (1995, 25-28, 34) is one example. Frankel and Wei (1996) give other references and extend the gravity analysis to focus on Southeast Asian trade patterns.

When the data from 1970 to 1992 are pooled, the ASEAN coefficient is 2.0, or 1.3 when allowing for ASEAN openness (Frankel and Wei 1997, table 1). Allowing for a trend in the coefficient shows no evidence of one (appendix table B5.3).

To test the effect of ASEAN on the change in trade, there is no one clear date on which to focus. ASEAN negotiated a preferential trade arrangement within its membership in 1977, but serious progress in removal of barriers did not even get under way until 1987. As recently as 1989, the fraction of goods eligible for regional preferences was only on the order of 3 percent. It was not until January 1992 that the members proclaimed plans for an ASEAN Free Trade Area (AFTA) to be implemented by reduction of tariffs and nontariff barriers in phases from 1993 to 2008 (DeRosa 1993, 1995; Jackson 1991; Panagariya 1994; Jaggi 1995; Frankel and Wei 1996). Thus we choose 1992 as the key date. A test of the change in intra-ASEAN trade between 1990 and 1992 shows an insignificant point estimate of .2 (Wei and Frankel 1995b, table 1).

A question such as ''what is the effect of ASEAN on trade among its members'' can change radically, depending on what other bloc effects are being tested at the same time. When we test for an East Asian bloc effect simultaneously with an ASEAN effect, the latter disappears completely. We will explore further layers of potential blocs below. If one is interested solely in formal regional arrangements, then one can accept at face value the strong bloc effects for ASEAN reported here. If one considers the larger, less formal blocs to be on equal footing *a priori*, then one will want to accept the verdict of the data that ASEAN has no independent effect: Southeast Asian countries trade a lot with each other simply as an example of the phenomenon that Asian countries trade a lot with each other, not out of any special ASEAN effect.

Wang (1992), Wang and Winters (1991), and Winters and Wang (1994) in gravity tests found the ASEAN dummy to reflect one of the most significant trading areas in the world. They did not include a broader dummy variable for intra-Asian trade.

East Asia Economic Caucus

We define East Asia to be the membership of the East Asian Economic Caucus (EAEC), which also coincides generally with the boundaries of the hypothesized yen bloc. The East Asia bloc effect follows a very different pattern from that of other regional groupings (table 4.3). In the first place, it starts out at a high level, by far the highest of any in the 1960s. The estimate in 1965 is 1.6, implying a fivefold effect on intra-Asian trade. In the second place, the coefficient gradually diminishes, though remaining statistically significant throughout the period. By 1992, it had fallen to .5, for an effect of 65 percent.

As with the other groupings, we want to allow for the possibility that most East Asian countries are open to trade of all sorts. The coefficient on East Asian openness is positive and significant. It appears to rule out any trade-diversion effects arising from the existence of the East Asian bloc: these countries trade an estimated 22 percent more with all parts of the world, other things equal, than do average countries [exp(.20) = 1.22]. The addition of the openness dummy often reduces the level and significance of the East Asian bloc dummy a bit. The coefficient is usually still significant statistically. The exceptions are 1991 and 1992, when making allowance for the high level of openness in East Asia deprives the bloc coefficient of its statistical significance. For the other years, 1965-90, the finding appears to be robust: allowing for a high level of openness among East Asian countries does not eliminate the significance of the extra tendency for them to trade among themselves (Frankel and Wei 1995c, 1995d, 1997; Frankel, Wei, and Stein 1995).

Disaggregation reveals that the bloc effect occurs largely in manufactures trade and (to a lesser extent) nonagricultural raw materials, rather than agricultural products (Frankel, Wei, and Stein 1995, tables 4a and b; Frankel, Stein, and Wei 1994, table 2). The East Asia bloc effect in manufactures remains almost as strong when one adds a term for linguistic links, of which the Chinese language is the strongest, as when one does not (compare with Frankel, Stein, and Wei 1994, tables 3b and 5).

When the four 1970-92 years are pooled (table 5.2), the East Asia bloc coefficient is estimated at .9 (.8 with the allowance for openness). When one allows for a trend, it is negative and statistically significant, as one would expect from the yearly results.[29]

This downward trend is not only a departure from the pattern in Western Europe and the Americas. It is, more importantly, a departure from the popular impression that Tokyo is rapidly turning East Asia into a Japan-centered yen bloc. Recall that this impression is supported by an appeal to the simple statistics on intraregional trade, which show a rapid increase in East Asia. But we have now learned that all of the increase in intra-Asian trade can be explained by the rapid growth of those economies. (GNP and GNP per capita are the only variables on the gravity list that change over time.) There is nothing left over to be attributed to an intensifying bloc. A typical East Asian country *i* trades far more with another East Asian country *j* than it did 20 years ago for much the same reason that countries everywhere in the world trade more with East Asian country *j* than they did 20 years ago: as a result of rapid growth, it now looms much larger in the world economy.

What about bilateral trade between Pacific Asian countries and Japan in particular? Like intraregional trade overall, trade with Japan increased

29. There are similar results in Frankel (1993, 1994), Frankel, Stein, and Wei (1996), Frankel and Wei (1993a, 1993b, 1994a, 1995a, 1995b, 1995c, 1997), Petri (1993), and Saxonhouse (1993)

rapidly in the second half of the 1980s. Most of this increase merely reversed a decline in the first half of the 1980s, however (Petri 1991, 1993). More importantly, the recent trend in bilateral trade between Japan and its neighbors can be readily explained as the natural outcome of the growth in Japanese trade overall and the growth in trade levels attained by other Asian countries overall. Lawrence (1991b) has calculated that, out of the 29 percentage point increase in the market share of Pacific Asian developing countries in Japanese imports from 1985 to 1988, 11 percentage points were attributable to improved competitiveness (as reflected in increased exports from Pacific Asia to worldwide markets), and 18 percentage points were attributable to the commodity mix of these countries' exports. There is no residual to be attributed to Japan's development of special trading relations with other countries in its region.[30]

We confirmed this finding by adding to our gravity model a separate dummy variable for bilateral Asian trade with Japan in particular. It was not even remotely statistically significant in any year, and indeed the point estimate was a small negative number (Frankel 1993, 1994). Thus there was no evidence that Japan has established or come to dominate a trading bloc in Asia.

It is perhaps surprising that the estimated level of the intraregional trade bias was higher in East Asia at the beginning of our sample period than in the other two parts of the world that we have examined. 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. But there are other possible regional effects that may be showing up spuriously as an East Asian bloc, to be considered below.

Before we anoint East Asia a trading bloc, we must consider the entrepôt effect. We have allowed for the level of openness of East Asian countries in general. But we should also allow for the extraordinarily high level of openness in two East Asian countries: Hong Kong and Singapore. Hong Kong, like Singapore, has levels of imports and exports well in excess of its GNP. The two have both long functioned as entrepots, transhipping goods on the way to other destinations, and they also import and export a lot of intermediate products. We have tried two kinds of dummy variables to test the hypothesis that these two island city-states are the true hubs of the East Asian bloc: one to represent their trade with other East

30. There is empirical literature on whether Japan is an outlier in its trading patterns, particularly with respect to imports of manufactures (e.g., Saxonhouse 1989; Noland 1991; Lawrence 1991a). Eaton and Tamura (1996) find that Japan, along with other East Asian countries, is more open to US exports than would be predicted by the gravity model (but less open to direct investment).

Asian countries and another to represent the general openness of Hong Kong and Singapore—that is, their trade with all partners regardless of location. The latter variable turns out clearly to be the appropriate one: when the two dummy variables are included simultaneously, it is only the openness variable that is significant. Its highly significant coefficient is about 1, indicating that Hong Kong and Singapore are each more open than other countries by a factor of about 2.7. When the Hong Kong and Singapore variable is used at the same time as the dummy variable for openness of all East Asian countries, the latter remains significant. Its point estimate is .25, which for 1980 and 1990 is lower than the East Asian openness coefficient when estimated without the presence of the Hong Kong-Singapore dummy. The introduction of the dummy does, however, knock down the strength of the East Asia bloc effect in the three years tested: 1980, 1985, and 1990 (Frankel 1993, table 2.5, and 1994). It is now in the range of .3 to .5 and at best of borderline statistical significance.

Continuing the process that began with ASEAN, we consider a sequence of nested candidates for trading blocs in the Pacific.[31] The significance of a given bloc effect turns out to depend very much on what other blocs are tested at the same time. One way to draw the boundaries is to include all the countries with eastern coasts on the Pacific, which includes Australia and New Zealand along with East Asia. We call this group ''Asian Pacific.'' Its coefficient and significance level are both higher than the East Asia dummy. When we broaden the bloc search and test for an effect of 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. The East Asia dummy remains significant, though at a lower level than the initial results that did not consider any wider Pacific groupings.

APEC

APEC appears to be the correct place to draw the boundary. When we test for an even broader definition of a Pacific Rim bloc, including Mexico and the South American countries that border the Pacific (Colombia, Ecuador, Peru, and Chile), it is not at all significant, and the other coefficients do not change.[32] It remains true that the intraregional biases in the EC and Western Hemisphere blocs each roughly doubled from 1980 to 1990, while intraregional biases in the Asia and Pacific areas did not increase at all.

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31. These results are reported in Frankel (1993, table 2.2 through 2.4, and 1994).

32. We count only the core 15 in APEC, excluding Mexico, Chile, and Papua New Guinea, which were not added until 1993.

The surprising finding is the magnitude of the APEC effect. Table 4.3 shows APEC to be highly statistically significant in most years (when estimated along with the East Asia bloc, which still seems to belong in the equation, but without the other nested groupings, which do not). There is a slight upward trend in the coefficient, reaching 1.2 in 1992: two APEC countries trade 3.3 times as much as two otherwise-similar countries. Introducing a term for openness of members (which, surprisingly, is negative), does little to change the APEC bloc estimate. The strong APEC bloc effect shows up under various permutations of the specification.[33]

When the years 1970, 1980, 1990, and 1992 are pooled (table 5.2), the coefficient on the APEC bloc effect is again a highly significant 1.1. When we allow for a trend, it turns out to be positive and significant.[34] The introduction of dummy variables for openness of the various groups reduces the estimated APEC bloc effect only slightly, though it eliminates the significant upward trend in that coefficient over 1970-92. The introduction of a dummy variable to represent the extra openness of Hong Kong and Singapore does not reduce the strength of the APEC bloc effect (Frankel 1993, 1994).

Others have emphasized the high volume of trans-Pacific trade. But it has been difficult to evaluate such statistics when no account is taken of these countries' collective size. As noted in chapter 3, a higher percentage of economic activity will consist of intraregional trade in a larger region 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 ''intraregional.'' Our gravity results show that the APEC effect is genuine.

Thus the United States and Canada appear to be full partners in the strongest group in the world, the Pacific bloc, even while simultaneously belonging to the significant but distinct Western Hemisphere bloc.

As with previous groups, we have estimated the APEC effect on disaggregated trade data as well. The bloc effect is always highly significant in agriculture and other raw materials. Trade in manufactured goods shows an APEC bloc effect that is statistically insignificant in 1965, borderline-significant in 1970, and only highly significant from 1975 on. Thus the upward trend that one would have expected from the APEC effect is

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33. See Frankel and Wei (1997), Frankel, Wei, and Stein (1995), and Frankel and Wei (1995c). In the first two studies, APEC members are again estimated to be significantly less open than predicted by gravity determinants. The third study shows the more expected result, where APEC members go from low openness to high openness during the course of the sample period. In all cases, the APEC bloc effect is high and significant.

34. We found similar results in Frankel and Wei (1993a, 1993b) and Frankel, Wei, and Stein (1995).

concentrated in manufactures (Frankel, Wei, and Stein 1995, table 4a; Frankel, Stein, and Wei 1994, table 2).[35] The APEC bloc effect in manufactures is attenuated slightly throughout the period if one allows both for the fact that APEC countries have a significantly lower-than-average level of openness in manufactures and one allows for the effect of linguistic links. Of the linguistic links, Chinese is the strongest, and English is the second strongest; both languages are relevant for the Pacific. The bloc effect does not turn positive until 1970, does not turn significant until 1975, and does not turn significant at the 99 percent confidence level until 1980 (Frankel and Wei 1995c, table 3).[36] Even so, the bloc effect in manufactures toward the end of the sample period is as strong for APEC as for any group. In agriculture and other raw materials, it is the strongest.

A number of readers (e.g., Polak 1996) have found the bloc effect that we estimate for APEC surprisingly high. We must admit to a bit of the same reaction ourselves, though this does not necessarily mean the result is wrong. One will never learn anything from statistics if one always throws out any results that differ from one's preconceptions. But it is worth trying to think of alternative explanations of the result.

One explanation that appears plausible is that the costs of transporting across and around the Pacific Ocean might be overstated by our distance measure. If this were true, then the estimate of the APEC coefficient would be biased upward: the amount of trans-Pacific trade would look surprisingly high because we would have exaggerated the cost of shipping across the ocean. Recall that our variable, the log of distance, already captures the declining marginal cost of transportation with respect to kilometers of distance. One possibility is that the log specification does not allow the marginal cost to fall off quickly enough. But the other functional forms we tried made little difference.

A more likely possibility is that the cost of ocean transport is less than the cost of land transport. Pacific trade consists disproportionately of ocean transport, while shipping among European or Western Hemisphere countries is more often over land, whether by rail or road. As already noted, we obtained data that allowed a distinction for land versus sea travel, from Winters and Wang. The APEC coefficient did indeed decline some when we estimated the equation with the Winters-Wang measure. The strong effect that had been estimated for 1980 fell only modestly,

35. If one neglects to correct for a lower-than-average level of openness with respect to manufactures among Pacific countries, the bloc effect in APEC manufactures is highly significant in 1965 and 1970 as well (Frankel, Stein, and Wei 1994, table 3b). This is also without the common language dummy.

36. If one allows for the languages but not for the low level of openness, then the APEC bloc effect in manufactures again does not take hold in a significant way until the 1970s (Frankel, Stein, and Wei 1994, table 5).

from 1.3 to .9.[37] A weaker bloc effect that had been estimated for 1990 in that study (possibly due somehow to the allowance for trade-diversion effects) loses its significance altogether with the Winters-Wang measure. The APEC point estimate drops from .55 to .32. The coefficient estimates on the East Asia, EC, and Western Hemisphere blocs are undiminished by the use of the Winters-Wang distance measure for 1990. In any case, the issue of water versus land transport should not affect results regarding changes in intraregional trade bias in the 1980s, given that the nature of shipping costs does not appear to have changed over as short a time span as five or ten years.

If one believes that distance has a smaller effect for Pacific countries' trade than for others' (e.g., shipping costs are lower per kilometer, even after holding constant for per capita GNP and the other variables), one might want to allow them to have different distance coefficients. Dhar and Panagariya (1995, table 1A) allow each exporting country to have its own distance coefficient. The average coefficient for the 13 APEC members is -1.53 (-1.74 for 10 East Asian members, including Australia, and $-.82$ for the three North American members). By comparison, the other nine countries that are estimated show an average distance coefficient of $-.92$ ($-.67$ for six European countries and -1.43 for three other LDCs). This piece of evidence tends to contradict the hypothesis that distance carries lower costs for APEC members than for other countries.

The finding that intra-APEC trade is high relative to the natural benchmark appears to be a correct conclusion. It supports the APEC enthusiasts, who describe trade within the group as an outstanding example of rapid market integration, ''where the initiative has remained primarily with enterprises acting separately from state decisions, and where official encouragement of regional integration does not include major elements of trade discrimination'' (Garnaut 1994). This is by contrast with institutional integration, which we have referred to as formal or explicit regional policies.[38]

Trading Blocs Among Other Less Developed Countries

In all the excitement about a possible system of three trading blocs—Europe, Americas, and East Asia—it is easy to forget that a large fraction of the planet's population lies outside these three groups. Here we consider the rest of Asia, and then Africa.

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37. Frankel, Wei, and Stein (1995, tables 2 and 3). For the 1980 results, the EC bloc effect loses its previous borderline significance when the Winters-Wang distance measure is introduced.

38. Drysdale and Garnaut (1993) borrow the terms institutional and market integration from Cooper (1974).

South Asia

Seven countries of the Indian subcontinent formed the South Asian Association for Regional Cooperation (SAARC) in 1985. The members are India, Pakistan, Bangladesh, Sri Lanka, Nepal, Bhutan, and the Maldives. Their first 10 years of talks had been even more fruitless than ASEAN's. In May 1995, however, the members agreed to put a preferential trade arrangement into place that December. How much substance there will be in this PTA remains to be seen.

In our sample, the term ''South Asia'' refers to only two members: India and Pakistan. One conjectures that historical animosity hurts trade between these two countries. Estimates show that this is indeed the case: their trade is 70 percent lower than two otherwise-identical economies (Frankel and Wei 1995d).[39]

Unfortunately, Bangladesh, Sri Lanka, and Nepal are not in our sample of available bilateral trade data. But Srinivasan and Canonero (1995, 29) do have data on trade among these countries and other major trading partners. They note that Bangladesh and Sri Lanka trade very little within the South Asia region. (Much of Nepal's trade is with India, but then Nepal has few alternative routes to the outside world.) The no-bloc finding that we obtained for South Asia might well generalize, even if all the members were represented.

Pan-Asian Groups

South Asians wonder if they should not be included in Asia. The habit of speaking of Asia east of Burma as a separate region called East Asia—that is, almost as a separate continent—has not always prevailed. It has become standard only in the last few decades, largely in response to the superior growth performance of most of these countries.[40] We have tried treating South and East Asia collectively as one candidate trading group. The coefficient for the East and South Asia group is 0.65 and significant, indicating that two countries in this group trade 90 percent more $[=\exp(0.65)-1]$ than a random pair of otherwise-identical countries. Given the aforementioned India-Pakistan finding, the positive coefficient on the East and South Asia bloc must reflect higher-than-average trade

39. Srinivasan and Canonero (1995, 29) also find a negative effect for India-Pakistan trade, as do Dhar and Panagariya (1995, 12-13). India-Pakistan trade is probably undercounted, however, by some $2 billion, according to *The Economist* (27 January 1996, 36). It is estimated that roughly half this amount is smuggled across the border and half goes by third-country ports.

40. Easterly (1995) and Easterly et al. (1993) see the drawing of the line that separates East Asia from the rest of Asia as endogenous.

between East and South Asian economies.[41] If we add the Hong Kong and Singapore dummies to the regression, the coefficients on the East Asia and East and South Asia dummies remain quantitatively large (1.36 and 0.37, respectively) and statistically significant (Frankel and Wei 1995d).

The next question to arise is whether the right place to draw the line dividing up Asia, if not between Burma and Thailand, is between Pakistan and Iran, or whether the proper Pan-Asian group instead goes all the way west to Turkey. We include in the regression the whole of the continent of Asia (i.e., adding Asian countries in the Middle East to the above list) as a potential bloc. Two results are noteworthy. First, East Asian economies continue to show certain inward bias among themselves. Second, even after controlling for a special East Asia effect, Asian economies as a group appear to trade more among themselves than one would expect based on their economic and geographic characteristics. There is no reason to draw a line between South Asia and the Middle East. Part of the pan-Asian trade concentration undoubtedly has to do with the fact that many Asian economies have to import a substantial amount of oil from the Middle East.[42]

Africa

There are fewer applications of the gravity model to Africa than to other continents. One is Foroutan and Pritchett (1993). They find, contrary to conventional wisdom that trade among sub-Saharan African countries is artificially low, that intra-African trade is somewhat higher than one would expect, given the poverty of the countries and other standard determinants. Poor countries tend not to trade much with anybody; thus the low level of trade within a group of all-poor countries, such as Africa, is not abnormal. This is consistent with what we found in chapter 2, in the intensity coefficients. Wang and Winters (1991) and Winters and Wang (1994) find the effects of two regional arrangements, ECOWAS and the South African Developing Coordination group, to be statistically insignificant.

Are Regional Trading Arrangements Trade-Diverting?

The gravity equation is useful for estimating magnitudes of trade creation and trade diversion. When a PTA is created or expanded, one cannot

41. Dhar and Panagariya (1995), however, find a negative effect for India-China trade, where there has been political and military animosity in the past.

42. Adding the Hong Kong and Singapore dummies does not change the qualitative features of the picture (Frankel and Wei 1995d).

base conclusions on simple observed changes in trade flows, without holding constant for changes in the countries' incomes over the same period. The bloc effects that we have already discussed can be interpreted as trade creation. In this section, we focus on trade diversion: the apparent effects of the regional arrangements on trade with nonmembers.

Diversion by European Groups

There has long been a fear among non-Europeans that regional integration on the continent would create a Fortress Europe, which raised barriers against imports from nonmembers. We begin by considering some results from studies by others.

Typical of studies of the earlier stages of regional integration in Europe is research by Kreinin (1972, 1981) on the formation of the European Community and on its enlargement, which found relatively little trade diversion, with trade creation larger by a multiple of five to seven times.

Gundlach et al. (1993, 212-19) summarize some recent studies, such as Davenport (1991) and Page (1992), of the effect of the 1992 Single Market on less developed countries. Within the category of primary commodities, very little trade diversion is expected because EU countries do not produce primary commodities or close substitutes. Even in the case of manufactured products, the authors themselves (Gundlach et al. 1993, 218) are relatively optimistic. They argue that the Single Market is likely to open up substantial new export opportunities that outweigh trade diversion.

The 1995 enlargement of the European Union—to take in Austria, Finland, and Sweden, formerly members of EFTA—could affect skill-intensive Japan, the United States, and Canada, while another future enlargement to include the poorer Czech and Slovak Republics, Poland, and Hungary should be felt more by the labor-intensive developing countries. This would be a repeat of the earlier assimilation of Spain, Portugal, and Greece into what was then the nine-member European Economic Community.

The studies of the external effects of EC 1992, cited above, emulate some earlier studies of the effects on income within Europe, in the respect that they allow dynamic effects on European growth. This approach tends to yield a rosier outlook for everyone. The dynamic effects, in contrast to earlier static (and generally small) estimates, are maximized under the assumption that the investment rate will be stimulated. The classic references, the Cecchini Report (1988) and Baldwin (1989), estimated that EC GNP by the end of the century would go up on the order of 2.5 to 6.5 percent as the result of the 1992 Single Market. This higher European income would raise imports from all trading partners. If the elasticity of import demand is about 2, then exports from nonmembers would go up at least 5 percent. This effect is to be netted against the negative effects of trade diversion.

The grounds for the dynamic estimates are unusually uncertain, however. We take GNPs as given in our analysis. To the extent that incomes are in fact endogenously determined by trade, our estimates understate the benefits of PTAs on outsiders.

The results for Europe from our gravity estimation are mixed. On the one hand, as we noted above, when the EC-12 are considered as a group, they generally appear open to trade with nonmembers (table B5.1; also see Frankel and Wei 1996, 1997), and that openness appears to increase over time (Frankel and Wei 1995c; Frankel, Wei, and Stein 1995).[43] On the other hand, specific tests of the effect of the expansion of the EC-6 to 9 in 1973 and the expansion of the 9 to 12 in the early 1980s find negative effects in the change in trade between existing members and the rest of the world (Wei and Frankel 1995b).[44] At the end of chapter 10, our goal will be to evaluate the long-term tendency for regionalizing groups to liberalize with respect to others, rather than to quantify the immediate static trade-diversion effects of a specific regional initiative that holds tariffs toward nonmembers constant. Thus we may want to take encouragement from the positive evidence on the long-run tendency toward openness among EU countries rather than focus on the negative evidence of short-term trade diversion.

In the case of EFTA, the dummy variable for trade with nonmembers always shows a negative effect. This is the tendency under all three approaches to the test: the coefficient on average, the trend in the coefficient, and the estimated effect of the expansion of the EFTA from four to five in 1970 (Frankel and Wei 1995c, 1996; Wei and Frankel 1997; Frankel, Wei, and Stein 1995; Wei and Frankel 1995b).[45]

If the question is the effect of formal PTAs, then the results from the broader groups that were not operative during the sample period are less relevant. For the record, however, tests for the EU-15 or for all of Western Europe tend more often toward a low degree of openness than a high degree (tables 4.2 and 4.3). Even though Western European countries engage in more trade than the average countries in our sample, this can be explained by the high levels of income, geographical proximity to other high-income countries, and so forth. The residual shows a lower level of openness than one would expect. The same is true of the EU-15. Evidently, it is the three new members of the European Union—Austria, Finland, and Sweden—that gave the 15 their negative openness coefficient.

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43. Table B5.3, however, does not reflect this.

44. The effects are estimated at -0.1 (borderline significant) and -0.3 (highly significant), respectively.

45. Trade with nonmembers showed an estimated coefficient on the expansion to include Iceland of -0.2.

Diversion by Western Hemisphere Groups

Studies of the Canada-US FTA expressed fears of a decline in trade with third countries. However, Clausing's (1995) careful analysis of the Canadian and US data, disaggregated by sector, finds no evidence of a negative effect on imports from other countries.

It is too soon to tell the actual effects of NAFTA, but some authors have predicted likely effects. Studies such as Hufbauer and Schott (1993) predict a quite small amount of trade diversion. In part, this is because US tariffs were already very low and were already slightly lower against some Mexican goods than against imports from other industrialized countries, due to various US tariff preference programs such as the Generalized System of Preferences and the maquilladora program.

The major barriers remaining in the United States, as in other industrialized countries, are not tariffs, however. Rather they are nontariff barriers (NTBs) and administrative protection (such as antidumping duties). Canada and Mexico are to a greater extent buffered from US NTBs by dispute settlement provisions under the NAFTA. Indeed, from their viewpoint this was the major objective in pursuing the FTA. Thus other countries' concerns about diversion of trade are still quite relevant (Krueger 1993).

Mexico ran a large and growing trade deficit in 1993 and 1994, which was initially perceived as beneficial for its trading partners. Following the peso crisis that broke in December 1994, the Mexican deficit suddenly disappeared. The private capital flows to support it had begun to dry up after February 1994, and the central bank's reserves virtually ran out in December. The unexpectedly large fall in the value of the peso that took place at that time, together with the subsequent sharp recession in Mexico in 1995, were the principal instruments of this adjustment. The United States and Canada experienced a decline in 1995 in Mexican demand for their imports.

Americans should not, however, view NAFTA as having been a mistake in light of the Mexican crisis—to the contrary. US exports to Mexico were still higher in 1995, the year after the crisis, than they were in 1993, before NAFTA (by 11 percent). Exports continued to rise strongly in 1996 (another 23 percent).

It is true that US imports from Mexico rose even more. But it has never been a good idea for the United States to judge the advantages of regional trading arrangements by the impact on the trade balance. The standard legitimate argument in favor of NAFTA, that it helped to lock in the recent beneficial Mexican economic reforms, including trade liberalization, has already shown its virtue in this crisis. In contrast to the 1982 debt crisis, when Mexico raised import barriers—tariffs and licensing requirements—in an effort to obtain the foreign exchange to service its debts, it did not raise trade barriers against the United States and Canada after the 1994 crisis. For this reason, the decline in Mexican imports from the United

States from 1994 to 1995 (9 percent) was less than the decline in Mexican imports from Japan and Europe, and much less than the decline at the time of the earlier crisis (a 50 percent fall in imports from the United States from 1981 to 1983). The United States gained market share in Mexico. From the US viewpoint, the effect is good. From the viewpoint of the rest of the world, it includes some trade diversion.

Next come the potential trade-diversion effects of an enlarged Free Trade Area of the Americas. Anticipating the Miami Summit, Hufbauer and Schott (1994, 163-64) estimated the prospective effects of a hemispherewide FTA. They calculated by commodity groups how much of the increased US imports from the rest of the hemisphere would represent diversion of trade that would otherwise come from other countries. The resulting numbers, while calculated to be somewhat biased upward, are still small. One reason already noted is that US tariff barriers are already low and will be even lower after the full implementation of the Uruguay Round: below 3 percent by 2000. (The estimates do not include the loss of exports to Latin America.) If tariffs in Latin America were as high now as they were 10 years ago, the trade diversion in these markets might be substantial. But tariffs in these countries have already dropped considerably and will probably come down even further. This fact, together with the fact that the Latin American market is not as large as that of United States, implies that trade diversion should not be that large.

For the Canada-US pair, we find a negative openness coefficient in 1970, turning to a positive one in 1992 (Frankel and Wei 1996). For NAFTA, we find a negative openness coefficient throughout, though it must be repeated that the sample period precedes the date that the agreement took effect (table 4.2). Mercosur often shows a negative openness effect early in the sample period but a positive openness effect late in the sample, particularly in 1990, when the customs union was actually being negotiated. The Andean Group shows a similar mix of estimated coefficients, looking encouragingly open in some estimates but less so in others. In the cases of these two South American groups, the most encouraging results come in the tests for the changes in trade with nonmembers. Openness effects of $+0.2$ after 1991 for Mercosur and $+0.4$ after 1990 for the Andean Group are both significant (Wei and Frankel 1995b; Yeats 1997). When examining the Americas in the aggregate, however, the fairly consistent finding (table 4.3) is a low level of openness. (See also Wei and Frankel 1997; Frankel and Wei 1996; Frankel, Wei, and Stein 1995 for results on openness effects in these regions.)

A provocative study of Mercosur by Yeats (1997), using a different methodology, claimed to find ''smoking gun'' evidence of adverse trade-diversion impacts on third countries. He found that trade within the customs union has grown most rapidly in those products in which members do not have a comparative advantage, as revealed by their failure

to export them competitively. These products—generally highly capital-intensive goods—are precisely the ones to which Mercosur's pattern of tariffs grants regional preferences.

Diversion by East Asia and Pacific Groups

East Asian groups show up as the most open of any to trade with the rest of the world. ASEAN shows little or no evidence of trade diversion. To the contrary, given their stage of development, the ASEAN countries consistently show a level of openness that is higher than for other countries in the sample (table 4.2; Frankel and Wei 1996; Wei and Frankel 1997). If 1990 is taken as the key date for ASEAN, the estimated effect on the change in trade with nonmembers is also positive (Wei and Frankel 1995b). The same openness is revealed for the broader grouping of East Asia (table 4.3; Frankel 1994; Frankel and Wei 1995c, 1995d; Frankel, Wei, and Stein 1995; Wei and Frankel 1995b, 1997).[46]

The results for the Australia-New Zealand CER are mixed. When estimated for individual years, the evidence points to trade diversion. When the data are pooled, the opposite sign emerges, suggesting a positive effect on trade with other countries. A test of the effect on the change in trade after 1983 also shows a positive coefficient (respectively, table 4.2; Wei and Frankel 1995b, 1997).

The results for APEC are also mixed. One set of estimates shows a pattern whereby the coefficient progresses from significantly negative in 1965 to significantly positive in 1990 (Frankel and Wei 1995c). Others show coefficients that are more consistently negative (table 4.3; Frankel, Wei, and Stein 1995; Wei and Frankel 1997). It is important to realize that these estimates already hold constant for the openness of East Asian (and Western Hemisphere) countries. Thus the additional APEC effect largely reflects the level of openness of Australia and New Zealand.

Summarizing the Results

The results regarding trading blocs are easily summarized. We have seen that the specifics of the relative magnitudes and trends of the bloc effects in different parts of the world are different from what one would conclude by looking at the simple statistics on intraregional trade shares. Nevertheless, the overall conclusion is the same. Even after holding constant for such natural determinants of bilateral trade as size and distance, intra-

46. These results are similar to those of Dhar and Panagariya (1995), who use the gravity model to find that East Asian countries are open with respect to outside countries, contrary to the usual view.

regional concentrations of trade are appearing in various parts of the world.

Looking at explicit preferential trade arrangements, we find the strongest effects for ASEAN and the Australia-New Zealand CER: each apparently serves to boost trade among its members an estimated fivefold or more (though the magnitude of the ASEAN effect diminishes somewhat when one makes allowance for the special role of Singapore). We also find very strong effects for the Andean Pact and Mercosur in the 1990s: each shows an estimated effect on trade in 1992 of roughly 2½ times. The EC effect becomes statistically significant from 1985. Estimates suggest an effect on intra-EC trade of about 65 percent, with the membership expansions of 1973 and 1983 each boosting trade by about half that amount. The expansion into the EU-15 is too recent to permit a test. Similarly, there is not yet enough data for us to have obtained meaningful estimates of the effects of North American regional trading arrangements, though others are beginning to do so.

If we wish to looking at broader regional groups, as opposed to formal preferential trade arrangements, we again find statistically significant effects. Western Europe is generally statistically significant throughout the period. The Western Hemisphere effect becomes significant and large in 1990. The Asia effect appears even more significant and is equally large from the beginning of the sample (1965). Unlike the European and Americas groups, there is no evidence of an upward trend in Asia. When allowance is made for the special role of Hong Kong and Singapore, or for the openness of the entire East Asian region, the magnitude of the Asian bloc effect is reduced. APEC appears to have a very strong bloc effect as well, which so far has proved relatively robust in the face of attempts to dislodge it.

We should not expect always to be able to tell from the data whether true concentration effects are coming from the formal regional trade arrangements or from the broader geographic groups, given the overlap in membership. Some readers will prefer to make the choice on *a priori* grounds. But in the case of Europe, the true effect appears to be coming from the leading trade arrangement on the continent, the European Union, while in the case of Pacific Asia it appears to be coming from the larger informal groups (East Asia and APEC) rather than from ASEAN.

None of these results is claimed to be definitive. We will want to see how they stand up to additional possible perturbations and extensions of the analysis.