Currency Blocs and Cross-Border Investment

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Abstract A currency board or dollarization implies a much stronger commitment to exchange rate stabilization and a much smaller likelihood of a reversal than merely pegging the domestic currency to a foreign currency or intervening in the foreign exchange market. The effect of these arrangements on cross-border trade in goods has been examined extensively in the recent literature. In contrast, there is no paper that we are aware of that has studied whether such a stronger commitment translate into a stronger stimulus to cross-border investment. This short paper studies this question by using a data set on bilateral foreign direct investment (FDI) from 16 source countries to 57 host countries. We found that lower exchange rate volatility is associated with a higher volume of FDI. Furthermore, the effect of a currency board or dollarization on bilateral FDI is much bigger than merely reducing exchange rate volatility from the sample mean to zero. According to our benchmark estimate, a host country that is a member of a dollar bloc receives as much as 185% more FDI from the U.S. than another otherwise identical host country.

Keywords: currency bloc, foreign direct investment.
JEL Classification Code: F2

1. Motivation

A currency board or dollarization implies a much stronger commitment to exchange rate stabilization and a much smaller likelihood of a reversal than merely pegging a domestic currency to a foreign currency or intervening in the foreign exchange market. This stronger commitment may translate into a greater stimulus to cross-border economic transactions. A booming literature in the recent years has devoted to examining the effect of these monetary arrangements on international trade (for example, Rose, 2000; Frankel and Rose, 2002; Rose and Engel, 2002; Glick and Rose, 2001; Rose and van Wincoop, 2001; Persson, 2001; Parsley and Wei 2001; Klein, 2002; and Tenreyro, 2002). In contrast to this expanding literature on the effect of a currency bloc on trade, there has not been any systematic evidence available on the effect of a currency bloc on cross-border investment. The purpose of this short paper is to fill this void and to provide such evidence on this question.

We make use of a data set on bilateral foreign direct investment (FDI) from 16 major source countries to 57 host countries in the mid-1990s. The data set covers international direct investment originated from most of the major source countries, including the United States, Japan, Germany, United Kingdom, France, Italy, Canada and Australia. It accounts for roughly two-thirds of the worldwide foreign direct investment during the period. To our knowledge, this is the most comprehensive data set available on bilateral FDI. The set of country pairs in the data set includes several with special currency bloc arrangements, including common membership in the European Monetary System, a long-term dollarization arrangement (Panama), and two economies that have adopted a currency board system with the U.S. dollar as the anchor currency (Hong Kong and Argentina). We investigate the effect of these currency bloc arrangements on bilateral investment flows in a way that is analogous to the papers on bilateral trade cited above.

There are several limitations on the FDI data set that we need to point out at the onset. First, the data set on bilateral FDI started in mid-1980s and ends in 1998. Since there has been virtually no change in the currency bloc arrangements in the data set, with the exception of Argentina, we cannot implement a true panel regression framework with

country-pair fixed effects. The same problem forced Rose (2000) to concentrate on cross-sectional evidence[1]. Likewise, we focus on cross-sectional evidence in this paper. Note, however, we do have source-country fixed effects in all our regressions. In addition, we will also report regression results with host-country random effects as a robustness check. Second, there are far fewer country pairs in the FDI data set than the corresponding trade data set. As a result, fewer country pairs with special currency bloc arrangements are in our data set. So our statistical inferences are more limited in scope than the studies by Rose (2000) and others on trade. Nonetheless, we believe that it is important to provide a first-cut evidence on the effect of a currency bloc on international direct investment.

Before we proceed to the analysis, it may be useful to point out two sets of related literature (in addition to the one on the effect of currency arrangements on trade which is referred to earlier). First, there is a large literature on the effect of uncertainty on investment. The general prediction is, though not always, that an increase in uncertainty would reduce investment [see, for example, Aizenman (1992) Dixit-Pindyck (1994), Rivoli and Salorio (1996), and Darby, etc. (1999)]. The empirical findings on the effect of exchange rate volatility on FDI are mixed [see, for example, Bailey and Tavlas (1991), Cushman (1985 and 1988), Goldberg and Kolstad (1994)]. As far as we know, none of the previous papers examined bilateral FDI for a large cross-section of country pairs. Furthermore, none of the empirical papers looked into the possible difference between currency blocs versus other "softer" types of fixed exchange rate systems in terms of their effect on FDI.

Second, there is a parallel literature that studies the effect of exchange rate volatility on international trade in goods. Until recently, a typical finding was that such an effect is quantitatively small (if any). However, by collecting new data on a large number of mostly small countries that have adopted a major currency as their own, Rose (2000) and other papers cited at the beginning of this paper, have documented that the effect of a common currency - what may be labeled as "institutional stabilization" - on expanding bilateral trade is substantially larger than the effect of merely reducing

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[1] Recently, Glick and Rose (2001) implemented panel regressions with newly collected historical data on trade and currency bloc arrangements. Historical data on bilateral FDI for a matrix of source and host

exchange rate volatility through market intervention or establishing a pegged exchange rate regime – what may be labeled as "instrumental stabilization." Parsley and Wei (2001) used an alternative empirical strategy that measures goods market integration by dispersion of prices of identical goods across countries model, which also have confirmed that institutional stabilization produces a much larger effect on market integration than merely eliminating exchange rate volatility.

Our main findings can be summarized as follows. A reduction in bilateral exchange rate volatility is associated with a higher volume of cross-border direct investment. Furthermore, a currency bloc arrangement (currency board or common currency) promotes investment to a degree that goes beyond instrumental stabilization. In particular, a host country that is dollarized or has a currency board anchoring to the U.S. dollar receives as much as 185% more FDI from the U.S. than another otherwise identical host country. This suggests that a firmer commitment to exchange rate stabilization in the form of a currency union or a currency board is associated with a non-linear benefit in economic integration in terms of increased FDI relative to a softer and more reversible type of exchange rate stabilization. However, given the limitation of the data set described above, these conclusions should be taken with two grains of salt (more than for the results on the effect of currency arrangement on goods trade).

The rest of the paper is organized in the following way. Section 2 describes the key data in the paper. Section 3 presents the empirical findings. Section 4 offers some concluding remarks.

2. Data

The key variables used in the following regressions are bilateral FDI, exchange rate volatility, currency blocs, trade blocs, corruption, government policies towards FDI, distance, linguistic ties, GNP and per capita GNP, corporate tax rates, average growth rates etc.

The bilateral FDI data comes from OECD (2000). This includes the volume of bilateral direct investment from 16 source countries to 57 host countries (see Appendix A for a complete list of source and host countries). We use the end-of-the-year stock data

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countries is not yet available.

from Table 8 of the OECD International Direct Investment Database (OECD 2000). Originally this is denominated in domestic currency, but we convert it into US dollars using the end-of-year exchange rates from the IFS CD-Rom. To reduce the influence of year-to-year fluctuations, we use the average of FDI stocks over 1994-1996 as our dependent variable.

On currency arrangements, our sample allows us to investigate a loosely-defined dollar bloc and a softer currency bloc formed by the European Monetary System (EMS). The dollar bloc consists of Panama (fully dollarized), Hong Kong (on a US dollar-anchored currency board since 1983) and Argentina (on a U.S. dollar-pegged currency board from 1991 to December 2001). The EMS went into the effect in 1979 where the bilateral exchange rates among the participating member countries are characterized by a set of central rates and the associated bands around which the actual exchange rate can fluctuate. The EMS is a softer currency bloc as its central rates have been adjusted a number of times and a few countries exited along the way. Our data set does not allow us to examine the effect of Euro, a much harder currency bloc, or the experience of more recently dollarized economies. Given the relatively small number of country pairs with special currency bloc arrangements, our results are inherently less robust than studies on trade with a much larger number of country pairs with special currency arrangements can be used. So this is just the first look at the question in the literature (conducted to the best of our ability). Additional future work needs to be done to see how generalizable the conclusion is.

Exchange rate volatility is defined as the coefficient of variation (standard deviation divided by the mean) of monthly exchange rates during 1994-96. The exchange rate (month end) data come from the IMF's International Financial Statistics CD-Rom. We will use also use an alternative definition of exchange rate, which will be explained later in the text. A number of variables are also employed in the analysis. Their definitions and sources are explained in Appendix B.

3. Empirical Results

Benchmark Specification

Let FDI(i,j) be the bilateral stock of foreign direct investment from source country i to host country j. In our empirical work, we start with the following benchmark specification, which is parallel to the highly successful gravity model in the empirical trade literature, augmented by variables that are relevant for bilateral direct investment:

$$\text{LOG(FDI(i,j))} = \Sigma_k \alpha_k D_k + \beta_1 \text{EXVOL(i,j)} + \beta_2 \text{CB(i,j)} + \beta_3 \text{LOG[DIST(i,j)]} + Z(i,j)\xi +$$
$$\delta_1 \text{LOG(GNP)}_j + \delta_2 \text{LOG(PGNP)}_j + X(j)\zeta + e(i,j)$$

where D_k is a source country dummy that takes the value of one if the source country is i (i.e., if k=i), and zero otherwise; EXVOL_{ij} is the coefficient of variation of monthly exchange rates between source country i and host country j; CB(i,j) is a currency bloc dummy that takes the value of one if the source country and host country belong to the same currency bloc(Dollar bloc or EMS), and zero otherwise; DIST(i,j) is a vector of distance from country i to country j; Z(i,j) is a vector of characteristics specific to the source-host country pairs; GNP_j is GNP of host country j and PGNP_j is per capita GNP of host country j; X(j) is a vector of characteristics of host country j except GNP and per capita GNP(Corporate tax rate, corruption, government policies towards FDI and the average of GDP growth rates over 1990-95); e(i,j) is an i.i.d. error that follows a normal distribution; and α_k, β_i, ξ, δ_i, and ζ (of appropriate dimensions) are parameters to be estimated.

This is a quasi-fixed-effects regression in that source country dummies are included. They are meant to capture all characteristics of the source countries that may affect the amount of their outward FDI, including their size and level of development. In addition, possible differences in the source countries' definition of FDI are controlled for by these country dummy variables under the assumption that the FDI values for a particular country pair under these definitions are proportional to each other with the exception of an additive error term that is not correlated with other regressors in the regression.

Note that we will focus on cross-section regressions rather than panels in this paper primarily because currency bloc arrangements (especially the dollar bloc) do not have much time variation within our sample. The data on bilateral FDI goes back to 1983. But among the country pairs for which we have data, there is only one pair that has a one-time change in currency bloc arrangement, i.e., the establishment of a currency board by Argentina in 1991 that anchors to the U.S. dollar. Had the bilateral FDI data gone back to earlier decades, we would have been able to explore time-series variations in currency bloc arrangements more systematically.

In Table 2 we estimate the effect of a currency bloc with the basic gravity equation, which contains distance, linguistic ties between the source and host countries, host country's GNP and per capita GNP, and source country fixed effects. This basic model fits well with our predictions: more FDI goes into a larger (i.e., bigger GNP) or richer or closer host country. A host country that shares a common linguistic tie with a source country tends to receive more FDI from that source country.

In terms of the central focus of this paper, a more volatile exchange rate proves to be a hindrance to inward FDI. A one standard deviation increase in exchange rate volatility (e.g., an increase from the sample mean 0.11 to 0.27) would lead a reduction in FDI by 42% (= -2.646 X 0.16).

In the second equation, we add a single dummy for all the currency blocs in the sample. The coefficient (1.15) is positive and statistically significant. This implies that membership in a common currency bloc helps the host country to attract FDI to an extent that goes beyond merely reducing exchange rate volatility to zero. The point estimate on exchange rate volatility declines a bit in absolute value (from –2.65 to –2.46), suggesting that part of the effect of exchange rate volatility reflects the FDI-promoting effect of a currency bloc.

In the third column, we enter the dollar bloc and the EMS bloc separately. Both variables are positive and statistically significant, but the effect of the dollar bloc is substantially stronger than the EMS. Taken literally, the point estimate on the dollar bloc variable suggests that a host country that is in the dollar bloc receives substantially more FDI from the U.S. (about **1122%** more, or exp{2.503}-1) than another otherwise identical host country. As apparent from this estimate, this is an enormous effect.

In the last column of Table 2, we separate the dollar bloc into three constituent country pairs involving the U.S.: US-Hong Kong, US-Argentina, and US-Panama. As we can see, all three host countries receive more FDI from the U.S. than other otherwise identical countries. The effect is strongest for Panama, which has adopted the U.S. dollar as its own currency for more than a century, followed by Hong Kong, which has a relatively credible currency board pegging to the U.S. dollar since 1983, and the weakest for Argentina, which has adopted a currency board pegging to the U.S. dollar since 1992 (although it exited ignominiously in 2001)[2].

Robustness and Extensions

In the remainder of the section, we conduct a sequence of robustness tests and extensions. They include (a) adding trade blocs, (b) adding other determinants of FDI, (c) employing an alternative definition of exchange rate volatility, (d) dealing with possible endogeneity of exchange rate volatility by using a 2SLS estimation, (e) utilizing alternative estimation methods. As we will demonstrate, while the point estimates change from specification to specification, the basic qualitative result still holds: a currency bloc helps to stimulate cross-border investment to an extent far greater than merely reducing exchange rate volatility to zero.

In Table 3, we add variables describing all trade bloc memberships in the sample: EU, NAFTA, ANCERTA, EFTA, and EAEC (Appendix C: The List of Currency Blocs and Trade Blocs). All trade bloc variables except for EFTA have positive coefficients, consistent with the notion that trade blocs also promote cross-border investment. Among the trade blocs, the effects for the EU and AZCERTA are statistically significant. The inclusion of the EU and trade blocs makes the EMS dummy lose significance. But the dollar bloc dummy continues to be positive and statistically significant.

In Table 4, we add a number of other determinants of FDI that were not included in the basic specification but that were suggested to be useful in other recent work (e.g., Wei 2000a and 2000c). First, we add host-country's corporate tax rate and a measure of its

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[2] Formal tests (of three null hypotheses, conducted separately) indicate that the pairwise equalities of the these three coefficients can all be rejected at the one percent level.

degree of corruption in equations (a) and (b), respectively. Both new regressors are negative and statistically significant. Thus, a higher tax rate or a more serious corruption level tends to deter inward FDI. With these variables, the currency bloc variables continue to be positive and statistically significant. Next, in the third column, we add measures of host-country incentives for FDI as well restrictions, compiled by Wei (2000c) from the PricewaterhouseCoopers' country reports. Finally, we add a measure of the host country's growth performance. The new regressors all have sensible signs. In particular, more FDI incentives and faster economic growth tend to attract inward FDI. More restrictions on FDI tend to discourage it. The most important observations for us are the coefficients on the currency bloc variables. While the EMS variable loses significance, the dollar bloc dummy continues to be positive and significant, though the point estimate had declined substantially. According to the last column in Table 4, a host country in the dollar bloc would receive 185% more FDI (=exp{1.049}-1) from the U.S. than other otherwise identical countries. While this estimate is a lot smaller than the benchmark regressions in Table 2, it remains very large quantitatively.

To see the robustness of our result to the definition of exchange rate volatility, in Table 5, we measure the volatility by standard deviation of growth rates of the monthly exchange rates rather than the coefficient of variation of the exchange rates in the previous tables. With this new measure, exchange rate volatility is negative and significant in the basic specification, but becomes insignificant or even positive when enough of other control variables are added in. So we conclude that the effect of exchange rate volatility is not robust when using the alternative definition. It is interesting to note, however, that the effect of a dollar bloc on FDI remains the same (positive and statistically significant).

As further checks on the specification, we have experimented with alternative estimation methods. In the first two regressions in Table 6, we apply a weighted least square estimation, where the product of the two countries' size, or LOG(GNP*GNPH), is used as weights. In the last regressions in Table 6 (Columns c and d), we add host-country random effects to the specification (source-country fixed effects are preserved). This makes relatively little difference to the coefficient estimates. In particular, the dollar

bloc dummy is still positive and statistically significant, but the effect of exchange rate volatility and the effect of the EMS bloc are not robust.

So far, all country pairs that report a zero value for bilateral FDI are dropped from the regression. In Table 7, we implement a Tobit specification. This has the effect of increasing the sample size from 387 to 437 observations. Most of the results from the previous specifications remain to be true. In particular, the dollar bloc continues to show a sizable stimulating effect on FDI that goes far beyond simply removing exchange rate volatility.

Argentina's currency board experience

The bilateral FDI data begins in 1983. Panama has been dollarized throughout this sample. Hong Kong's dollar-pegged currency board started in 1983 and therefore does not exhibit any variation in the status of currency regime either. Argentina is the only country that adopted a currency board in the middle of the sample (in 1991). Therefore, the limitation of the data is such that one cannot perform meaningful panel regressions with country fixed effects.

Nonetheless, one can take a closer look at the experience of Argentina with regard to inward FDI from the U.S. before and after the currency board. This is not meant to be a solid proof of anything, but a simple reality check on whether the basic hypothesis in this paper can be said to be plausible.

In the top panel of Table 8, we report, for the five years leading up to the adoption of the currency board in Argentina, the year-to-year growth rate of US FDI to all other countries in the world and the growth rate of its FDI to Argentina. We can see clearly that for every year except 1990, the growth rate of US FDI to Argentina fell far behind that of its FDI to all other countries. In fact, the average annual growth rate of the US FDI to Argentina during 1986-1990 was –0.8%. In contrast, the average annual growth rate of the US FDI to the rest of the world was a robust 13.4%.

In the lower panel of Table 8, we report similar FDI growth rates for the five years after the adoption of a currency board in Argentina. In contrast to the pre-currency board period, the U.S. FDI to Argentina increased at a faster pace than the U.S. FDI to

other countries <u>in every single year</u>, and often by a large margin. While the average growth rate of the U.S. FDI to the rest of the world was 10.8% per annum, its FDI to Argentina grew at a breath-taking rate of 24.6% per annum.

Again, this table is not a definitive proof of anything as we are not able to control for many other factors that may be responsible for the difference in the FDI growth rates. In particular, since the FDI to Argentina already turned positive in 1990, we are not able to rule out the possibility that the robust FDI performance in Argentina during 1991-1995 was simply a continuation of the earlier trend. However, the contrast before and after the currency board adoption is numerically large. This is at least consistent with the hypothesis that a currency board (or dollarization) provides a strong stimulus to cross-border FDI.

4. Conclusion

We set out to investigate whether an institutional stabilization of exchange rate volatility, such as a currency board or dollarization, would stimulate cross-border investment by an extent much bigger than simply reducing exchange rate volatility. Our empirical results suggest that the answer is affirmative. In particular, a host country that is in a dollar bloc tends to receive substantially more FDI from the U.S. than an other otherwise identical country. Our basic point estimate suggests that the dollar bloc membership is likely to give an extra boost to FDI from the U.S. by 185%.

It is important to note that our statistical results do not rule out the possibility that there may be other aspects of being in a dollar bloc rather than the currency arrangement *per se* that have provided the extra stimulus to inward FDI that is documented in this paper. We have controlled some of the obvious candidates, including distance, linguistic tie, corruption level, etc. However, there are still many other factors that are hard to measure, which may play a part in the increase in FDI. Therefore, we cannot say conclusively that the exchange rate arrangement is the only thing that is responsible for the unusually large FDI flows. In addition, as we have a relatively small number of country pairs in the currency bloc category, we have not considered endogenizing the

decision to form a currency bloc in this paper[3]. Nonetheless, it is useful to document this strong link between the size of FDI and measures of exchange rate arrangements. Furthermore, it is interesting to observe that, among the dollar bloc countries, the extra stimulus on FDI is the strongest for Panama, which has the longest history in adopting the U.S. dollar as its own currency, and weakest for Argentina, which has the shortest currency board arrangement in the sample that pegs to the dollar and has perhaps the weakest credibility. A number of extensions and robustness checks have affirmed the basic pattern described above, which further supports our case.

      This paper should be regarded as a first, but important, step in investigating whether currency bloc arrangements provide extra stimulus to FDI beyond eliminating exchange rate volatility. It would be useful in future work to find ways to expand our FDI data both in time and in cross-country dimensions in order to control better any other unobserved country-pair characteristics.

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[3] See Alesina and Barro (2002), Tenreyro (2002) and Parsley and Wei (2001).

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Appendix A: The List of Source Countries and Host Countries

Source Country	Host Country	
1. Australia	1. Australia	40. Colombia
2. Austria	2. Austria	41. Costa Rica
3. Canada	3. Belgium–Luxembourg	42. Netherlands Antilles
4. Finland	4. Canada	43. Panama
5. France	5. Czech Republic	44. Venezuela
6. Germany	6. Denmark	45. Saudi Arabia
7. Greece	7. Finland	46. United Arab Emirates
8. Iceland	8. France	47. Iran
9. Italy	9. Germany	48. Israel
10. Korea	10. Greece	49. China
11. New Zealand	11. Hungary	50. Taiwan, China
12. Poland	12. Iceland	51. Hong Kong
13. Sweden	13. Ireland	52. India
14. Switzerland	14. Italy	53. Indonesia
15. United Kingdom	15. Japan	54. Malaysia
16. United States	16. Korea	55. Philippines
	17. Mexico	56. Singapore
	18. Netherlands	57. Thailand
	19. New Zealand	
	20. Norway	
	21. Poland	
	22. Portugal	
	23. Spain	
	24. Sweden	
	25. Switzerland	
	26. Turkey	
	27. United Kingdom	
	28. United States	
	29. Bulgaria	
	30. Romania	
	31. Slovak Republic	
	32. Slovenia	
	33. Ukraine	
	34. Egypt	
	35. Morocco	
	36. South Africa	
	37. Argentina	
	38. Brazil	
	39. Chile	

Appendix B: Source and Construction of the Variables

Bilateral Foreign Direct Investment
Source: OECD, <u>International Direct Investment Statistics Yearbook 1998</u>, Diskettes. Original data are converted into million US$ using the yearly average exchange rates from IFS CD-Rom.

Distance
Greater Circle Distance (in kilometers) between economic centers (usually capital cities) in a pair of countries based on the latitude and longitude data.
Source for latitude and longitude: Rudloff, updated from Pearce and Smith.

Linguistic Tie
Source of major languages: CIA world facts book, from
http://www.odci.gov/cia/publications/factbook/
Dummy = 1 if the two countries share a common language or have a former colonial relation.

Corruption – GCR/WDR Index
Source: Global Competitiveness Report 1997, World Development Report 1997.
Transformation: values in this paper = 8 – original values.
Data are from Wei (2000).

Gross Domestic Product (GDP) and GDP Per Capita
Source: World Bank SIMA/GDF & WDR central database.
GDP data are GDP at market prices (constant 1995 US$).
GDP per capita data are using GDP divided by population.

Exchange Rates
Source: IMF, IFS CD-Rom.

Corporate Tax rates:
Source: Wei (2000), which is from PwC (2000), updated from GCR (1997).

Appendix C: List of Currency Blocs and Trade Blocs

1) *De Facto* Dollar Bloc

Panama, Argentina, Hong Kong and United States

2) European Monetary System

- West Germany, France, Belgium, Denmark, Netherlands, Ireland, Portugal, Spain, Luxemburg; Italy(left in1992), UK(left in 1992), Greece(left in 1992); Finland(joined 10/14/1996)

3) NAFTA(3): Canada, US, Mexico

4) European Free Trade Area(EFTA, 6): Austria, Finland, Norway, Sweden, Switzerland, Iceland

5) East Asia Economic Caucus (EAEC, 10): Japan, Indonesia, Taiwan, Hong Kong, S. Korea, Malaysia, Philippines, Singapore, Thailand, China

6) ANZCERTA(2): Australia, New Zealand

7) European Union(15) Original members in 1957: Belgium, France, Germany, Italy, Luxembourg and the Netherlands. New members with four successive enlargements: 1973, Denmark, Ireland and the United Kingdom; 1981, Greece; 1986, Portugal and Spain; 1995, Austria, Finland and Sweden.

Source: Frankel (1992).

Table 1. Summary Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
Exchange Rate Volatility	1103	0.11	0.156	0	0.92
Exchange Rate Volatility(Dollar Bloc)	3	-	-	-	-
Exchange Rate Volatility(EMS)	25	0.016	0.010	0	0.033
GNP(billion US dollars)	56	469	1183	6.6	7232
Per Capita GNP(US dollars)	56	12076	11248	370	41370
Average Annual Growth Rate from 1990-1995	48	1.38	1.33	-1.14	5.05
Average FDI from 1994-1996 (Million US dollars)	406	3,985	11,318	0.03	122,260
FDI Restrictions	46	1.74	1.18	0	4
FDI Incentives	46	1.65	0.71	0	3
Corporate Tax Rate	52	32	7.1	0	42
GCR/WDR	51	3.3	1.4	1.3	5.5
Distance	1097	7088	4989	56	19857
Inflation Rate (%)	49	16.7	32.4	-0.09	197.5
M2 Growth Rate (%)	41	22.7	23.5	-4.73	111.6

Table 2. Benchmark Regressions

Dependent variable: log(FDI), averaged over 1994-96

	(a)	(b)	(c)	(d)
Constant	-8.371**	-8.625**	-8.752**	-8.978**
	(2.050)	(2.019)	(1.993)	(2.008)
Exchange Rate Volatility	-2.646**	-2.464**	-2.450**	-2.433**
	(0.720)	(0.716)	(0.718)	(0.718)
Currency Bloc		1.146**		
		(0.439)		
Dollar Bloc			2.503**	
			(0.755)	
(US-Hong Kong)				2.203**
				(0.223)
(US-Argentina)				1.134**
				(0.189)
(US-Panama)				4.193**
				(0.318)
EMS			0.731$^\#$	0.732$^\#$
			(0.472)	(0.473)
Log(distance)	-0.322**	-0.293**	-0.312**	-0.308**
	(0.084)	(0.084)	(0.084)	(0.084)
Adjacent	1.169**	1.056**	1.082**	1.087**
	(0.310)	(0.326)	(0.323)	(0.324)
Linguistic tie	1.217**	1.308**	1.314**	1.311**
	(0.450)	(0.449)	(0.449)	(0.448)
Log(GNP)	0.685**	0.686**	0.695**	0.702**
	(0.071)	(0.070)	(0.070)	(0.070)
Log(Per capita GNP)	0.128*	0.120$^\#$	0.120$^\#$	0.121$^\#$
	(0.077)	(0.077)	(0.077)	(0.077)
Source fixed effects?	Yes	Yes	Yes	Yes
Adjusted R^2	0.72	0.72	0.72	0.72
No. of obs.	406	406	406	406

Notes:
1. Fixed-effects regression: logFDI(i,j) = country dummies + b X(i,j) + e(i,j); where FDI(i,j) is FDI from source country i to host country j. All regressions include source country dummies whose coefficients are not reported to save space.
2. **, *, and # indicate significant at the 5%, 10%, and 15% levels, respectively; robust standard errors are in parentheses.
3. Log(FDI) is averages over 1994-1996. Exchange rate volatility = coefficient of variation of monthly bilateral exchange rate between source and host country over 1994:1-1996:12. GNP and per capita GNP are in 1995 US dollars.
4. The null hypotheses that b(HK)=b(Argentina), b(HK)=b(Panama) and b(Argentina)=b(Panama) can be individually rejected at the one per cent level.

Table 3. Adding Separate Trade Blocs

Dependent variable: log(FDI), averaged over 1994-96

	(a)	(b)	(c)	(d)	(e)
Exchange Rate Volatility	-2.338**	-2.297**	-2.289**	-2.078**	-2.269**
	(0.730)	(0.732)	(0.730)	(0.736)	(0.730)
Currency Bloc	1.043**				
	(0.453)				
Dollar Bloc		2.544**	2.521**	2.517**	
		(0.766)	(0.775)	(0.787)	
(US-Hong Kong)					2.173**
					(0.222)
(US-Argentina)					1.139**
					(0.192)
(US-Panama)					4.271**
					(0.324)
EMS		0.556	0.475	0.472	0.474
		(0.480)	(0.502)	(0.509)	(0.503)
Trade Bloc	0.320	0.388$^{\#}$			
	(0.262)	(0.262)			
EU			0.446$^{\#}$	0.555**	0.449$^{\#}$
			(0.275)	(0.281)	(0.275)
NAFTA			0.283	0.280	0.277
			(0.508)	(0.490)	(0.508)
AZCERTA			3.179**	3.301**	3.203**
			(0.922)	(0.930)	(0.921)
EFTA			-0.208	-0.178	-0.201
			(0.520)	(0.521)	(0.520)
(EAEC)				1.581**	
				(0.583)	
Log(distance)	-0.228**	-0.235**	-0.203*	-0.127	-0.198*
	(0.104)	(0.103)	(0.104)	(0.107)	(0.105)
Adjacent	1.086**	1.122**	1.310**	1.431**	1.316**
	(0.326)	(0.322)	(0.352)	(0.357)	(0.353)
Linguistic tie	1.279**	1.279**	1.124**	1.115**	1.119**
	(0.447)	(0.446)	(0.444)	(0.441)	(0.443)
Log(GNP)	0.681**	0.691**	0.689**	0.677**	0.696**
	(0.070)	(0.069)	(0.070)	(0.069)	(0.070)
Log(Per capita GNP)	0.105	0.102	0.115$^{\#}$	0.136*	0.116$^{\#}$
	(0.078)	(0.078)	(0.078)	(0.073)	(0.078)
Source country fixed effects?	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.72	0.72	0.73	0.73	0.73
No. of obs.	406	406	406	406	406

Table 4. Adding More Explanatory Variables

	(a)	(b)	(c)	(d)
Constant	-8.453**	-6.145**	-5.933**	-6.501**
	(2.006)	(1.939)	(1.925)	(1.976)
Exchange Rate Volatility	-2.301**	-1.708**	-1.347*	-0.755
	(0.729)	(0.776)	(0.817)	(0.892)
Dollar Bloc	1.376**	1.390**	1.139**	1.049*
	(0.345)	(0.225)	(0.552)	(0.545)
EMS	0.605	0.556	0.514	0.450
	(0.464)	(0.464)	(0.408)	(0.402)
Trade Bloc	0.365	0.406$^{\#}$	0.419*	0.375$^{\#}$
	(0.266)	(0.266)	(0.251)	(0.257)
Log(distance)	-0.310**	-0.273**	-0.246**	-0.359**
	(0.100)	(0.099)	(0.095)	(0.102)
Adjacent	0.881**	0.964**	1.008**	0.796**
	(0.304)	(0.296)	(0.276)	(0.278)
Linguistic tie	1.332**	1.196**	1.352**	1.354**
	(0.438)	(0.419)	(0.328)	(0.339)
Log(GNP)	0.757**	0.789**	0.748**	0.764**
	(0.074)	(0.072)	(0.065)	(0.065)
Log(Per capita GNP)	0.027	-0.213*	-0.174*	-0.101
	(0.081)	(0.121)	(0.106)	(0.112)
Corporate Tax	-0.033**	-0.043**	-0.043**	-0.039**
	(0.013)	(0.014)	(0.014)	(0.015)
Corruption(GCR/WDR)		-0.310**	-0.223**	-0.196**
		(0.095)	(0.088)	(0.088)
FDI Restrictions			-0.349**	-0.352**
			(0.074)	(0.082)
FDI Incentives			0.410**	0.332**
			(0.115)	(0.115)
Average GDP Growth Rate over 1990-95				19.244**
				(7.651)
Source country fixed effects?	Yes	Yes	Yes	Yes
Adjusted R^2	0.75	0.75	0.78	0.78
No. of obs.	391	389	368	349

Table 5. Alternative Measure of Exchange Rate Volatility:
Standard Deviation of the First Difference in Log Exchange Rate

	(a)	(b)	(c)	(d)
Constant	-10.305**	-10.510**	-6.918**	-5.136**
	(2.077)	(2.042)	(2.045)	(2.040)
Exchange Rate Volatility	-0.050*	-0.049*	0.048	0.079**
	(0.028)	(0.028)	(0.032)	(0.034)
Currency Bloc	1.115**			
	(0.463)			
Dollar Bloc		2.656**	1.167**	1.444**
		(0.801)	(0.481)	(0.515)
EMS		0.614	0.489	0.431
		(0.487)	(0.399)	(0.381)
Trade Bloc	0.422#	0.491*	0.506**	0.360#
	(0.260)	(0.260)	(0.256)	(0.249)
Log(distance)	-0.178*	-0.187**	-0.371**	-0.380**
	(0.105)	(0.105)	(0.104)	(0.100)
Adjacent	1.143**	1.179**	0.792**	0.110**
	(0.330)	(0.326)	(0.279)	(0.036)
Linguistic tie	1.300**	1.301**	1.416**	1.256**
	(0.443)	(0.442)	(0.332)	(0.327)
Log(GNP)	0.701**	0.710**	0.788**	0.748**
	(0.071)	(0.070)	(0.068)	(0.065)
Log(Per capita GNP)	0.136*	0.133*	-0.100	-0.201*
	(0.078)	(0.078)	(0.112)	(0.118)
Tax			-0.045**	-0.061**
			(0.015)	(0.016)
Corruption(GCR/WDR)			-0.262**	-0.224**
			(0.088)	(0.087)
FDI Restrictions			-0.370**	-0.397**
			(0.081)	(0.079)
FDI Incentives			0.338**	0.371**
			(0.115)	(0.109)
Average GDP Growth Rate Over 1990-95			25.505**	35.073**
			(7.705)	(8.293)
Log(distance)*North2				0.110**
				(0.036)
Source country fixed effects?	Yes	Yes	Yes	Yes
Adjusted R^2	0.72	0.72	0.78	0.79
No. of obs.	406	406	349	349

Table 6. Alternative Estimation Methods

	(a) WLS	(b) WLS	(c) Host Country Random Effects	(d) Host Country Random Effects
Constant	-9.336**	-9.570**	-16.895**	-9.918**
	(1.725)	(1.723)	(4.010)	(3.573)
Exchange Rate Volatility	-2.383**	-2.338**	-2.759*	0.653
	(0.632)	(0.630)	(1.658)	(1.771)
Currency Bloc	1.070**			
	(0.462)			
Dollar Bloc		2.597**	1.957**	1.221**
		(0.938)	(0.648)	(0.381)
EMS		0.575	-0.011	-0.037
		(0.531)	(0.387)	(0.348)
Trade Bloc	0.267	0.334	0.300	0.251
	(0.265)	(0.267)	(0.274)	(0.264)
Log(distance)	-0.240**	-0.247**	-0.526**	-0.540**
	(0.109)	(0.108)	(0.113)	(0.106)
Adjacent	1.000	1.041**	1.176**	0.956**
	(0.387)	(0.384)	(0.309)	(0.282)
Linguistic tie	1.285**	1.284**	0.794**	0.892**
	(0.371)	(0.370)	(0.364)	(0.317)
Log(GNP)	0.684**	0.694**	1.108**	1.085**
	(0.064)	(0.064)	(0.153)	(0.125)
Log(Per capita GNP)	0.147*	0.144*	0.028	-0.424**
	(0.080)	(0.080)	(0.175)	(0.214)
Tax				-0.061**
				(0.030)
Corruption(GCR/WDR)				-0.429**
				(0.176)
FDI Restrictions				-0.511**
				(0.167)
FDI Incentives				0.457**
				(0.213)
Average GDP Growth Rate				39.435**
				(15.816)
Log(distance)*North2				0.140**
				(0.043)
Source fixed effects?	Yes	Yes	Yes	Yes
Adjusted R^2	0.66	0.67	0.74	0.80
No. of obs.	387	387	406	349

Table 7. Tobit Estimation

	(a)	(b)	(c)	(d)	(e)	(f)
Constant	-3.197**	-0.668**	-0.647**	-3.741**	0.041**	-0.081**
	(0.128)	(0.058)	(0.059)	(0.152)	(0.055)	(0.056)
Exchange Rate Volatility	-1.992**	-0.064	-0.029	-0.009	-0.086**	0.090**
	(0.295)	(0.320)	(0.337)	(0.012)	(0.018)	(0.017)
Currency Bloc		0.610**			0.661**	
		(0.222)			(0.212)	
Dollar Bloc	2.054**		1.234**	2.247**		1.281**
	(0.612)		(0.593)	(0.602)		(0.586)
EMS	0.502**		0.390*	0.607**		0.402*
	(0.275)		(0.235)	(0.268)		(0.231)
Trade Bloc	0.328**	0.021	0.074	0.404**	-0.081	0.146$^{\#}$
	(0.118)	(0.101)	(0.094)	(0.130)	(0.093)	(0.092)
Log(distance)	-0.236**	-0.253**	-0.260**	-0.232**	-0.294**	-0.303**
	(0.013)	(0.006)	(0.006)	(0.013)	(0.006)	(0.006)
Adjacent	0.813**	0.938**	0.950**	0.797**	0.968**	0.969**
	(0.200)	(0.188)	(0.187)	(0.202)	(0.179)	(0.182)
Linguistic tie	1.290**	1.056**	1.029**	1.403**	1.116**	1.102**
	(0.171)	(0.197)	(0.206)	(0.160)	(0.188)	(0.190)
Log(GNP)	0.427**	0.455**	0.454**	0.427**	0.451**	0.448**
	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)	(0.005)
Log(Per capita GNP)	0.223**	-0.011*	-0.015**	0.257**	-0.037**	-0.044**
	(0.013)	(0.006)	(0.006)	(0.016)	(0.007)	(0.006)
Corporate Tax		-0.032**	-0.031**		-0.048**	-0.047**
		(0.002)	(0.002)		(0.002)	(0.002)
Corruption(GCR/WDR)		-0.126**	-0.130**		-0.128**	-0.131**
		(0.015)	(0.015)		(0.016)	(0.016)
FDI Restrictions		-0.340**	-0.340**		-0.393**	-0.389**
		(0.047)	(0.045)		(0.041)	(0.039)
FDI Incentives		0.281**	0.293**		0.310**	0.327**
		(0.042)	(0.041)		(0.038)	(0.037)
Average GDP Growth Rate over 1990-95		19.532**	19.554**		30.004**	30.638**
		(2.852)	(2.967)		(3.401)	(3.457)
Log(distance)*North2		0.080**	0.080**		0.124**	0.131**
		(0.009)	(0.009)		(0.011)	(0.011)
Source country fixed effects	Yes	Yes	Yes	yes	Yes	Yes
Quasi-Adjusted R^2	0.70	0.85	0.76	0.70	0.77	0.77
No. of obs.	437	372	372	437	372	372

Note: 1. Standard deviation of the growth rate of monthly exchange rates is used in equation (d) and (f) as exchange rate volatility.

Table 8. Before and After a Currency Board:

U.S. FDI into Argentina

(Unit: million US dollars)

Five years before the currency board	1986	1987	1988	1989	1990	Average (1986-1990)
US FDI to the World	259834	314336	335915	381781	430521	344477
Growth Rate	12.8	21.0	6.9	13.7	12.8	**13.4**
US FDI to Argentina	2913	2744	2597	2215	2531	2600
Growth Rate	7.7	-5.8	-5.4	-14.7	14.3	**-0.8**
Five years after the currency board	**1991**	**1992**	**1993**	**1994**	**1995**	**Average (1991-1995)**
US FDI to the World	467844	502063	564283	640320	717554	578413
Growth Rate	8.7	7.3	12.3	13.5	12.1	**10.8**
US FDI to Argentina	2831	3327	4442	5945	7498	4809
Growth Rate	11.9	17.5	33.5	33.8	26.1	**24.6**

Source: Authors' calculation from OECD (2000)