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Economic Integration and the Exchange Rate Regime: How Damaging are Currency Crises?†

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Abstract:
We use consumer price data for 205 cities/regions in 21 countries to study PPP deviations before, during and after the major currency crises of the 1990s. We combine data from industrialized nations in North America (Unites States, Canada and Mexico), Europe (Germany, Italy, Spain and Portugal), Asia (Japan and South Korea), and Oceania (Australia and New Zealand) with corresponding data from emerging market economies in South America (Argentina, Bolivia, Brazil, Columbia) and Asia (India, Indonesia, Malaysia, Philippines, Taiwan, Thailand). By doing so, we confirm previous results that both distance and border explain a significant amount of relative price variation across different locations. We also find that currency attacks had major disintegration effects by considerably increasing these border effects and by raising within-country relative price dispersion in emerging market economies. These effects are found to be quite persistent since relative price volatility across emerging markets today is still significantly larger than a decade ago.

JEL classification: F40, F41

Keywords: Relative price volatility, spatial data, real exchange rate volatility, law of one price, purchasing power parity, currency crisis, contagion, economic integration

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1 Introduction

Recent research has aimed at improving our understanding of the magnitude and determinants of deviations from purchasing power parity (PPP) and the law of one price (LOOP). One branch of the literature estimates the half-lives of real exchange rates. For most countries and time periods, real exchange rates are found to be highly persistent, with deviations from PPP amongst industrialized nations having half-lives of three to five years (see Rogoff (1996) for a reference). A second approach focuses on the comparison of movements in goods prices across national borders to price movements between different regions within a country. A seminal paper by Engel and Rogers (1996) finds that both distance and the border are significant in explaining relative price dispersion in fourteen U.S. and nine Canadian locations. They show that (i) relative price variability increases with distance within each country and (ii) U.S.-Canadian relative price variability is significantly larger than within-country variability. They provide what they call the 'width of the border', a useful measure of how important the border is relative to distance. Their estimates suggest that crossing the U.S.-Canadian border is equivalent to 75,000 miles of distance, that is, in order to generate the same degree of relative price volatility by distance within a countries, the cities would have to be 75,000 miles apart. By this 'width-of-the-border' metric, international failures of PPP/the LOOP are large.

The role of borders and geography have increasingly received more attention in economics and a number of recent papers have discovered evidence of such border effects for additional locations. Engel et al. (1997) and Parsley and Wei (2001a) use data from North America, Asia and Europe to study intra-national, intra-continental and intra-planetary deviations from the LOOP, whilst Engel and Rogers (2001) and Hufbauer et al. (2001) focus exclusively on European locations. In two additional papers, Beck and Weber (2001) and Beck (2003) employ both aggregated consumer price index (CPI) data and disaggregated data for various categories of consumer goods for thirteen German, twenty Austrian, five Finnish, twenty Italian, eighteen Spanish, seven Portuguese and four Swiss cities to study the integration effects arising from the European Monetary Union (EMU) and the German Monetary and Economic Union (GEMU). The authors find that under the EMU the elimination of nominal exchange rate volatility has largely but not completely reduced both the border and distance effects, but distance and border still matter for intra-European relative price volatility in the EMU sample period (January 1999 to December 2002).

The current paper analyzes an even larger data set. We use CPI data 205 locations in 21 countries to study deviations from the PPP before, during and after the major currency crises of the 1990s. We combine data from industrialized nations in North America (Unites States, Canada, Mexico), Europe (Germany, Italy, Spain and Portugal), Asia (Japan and South Korea) and Oceania (Australia and New Zealand) with corresponding data from emerging market economies in South America (Argentina, Bolivia, Brazil, Columbia) and Asia (India, Indonesia, Malaysia, Philippines, Taiwan, Thailand). To our knowledge this is by far the largest spatial price data set employed in the literature to date.

Our estimation equations are similar to the ones used in Engel and Rogers (1996): The dependent variable is the variance of changes in the log of real exchange rate across cities, and among the explanatory variables are distance and 'border' dummy variables. Since our global data set has city price data from several countries we are able to include, in addition to distance, both a border dummy variable and a measure of nominal exchange rate variability in a regression explaining the variability of (common-currency) prices across cities. This allows us to assess separately the role of nominal exchange rate variability and the effects of a border. Our results indicate that most of the failures of PPP are attributable to currency volatility, but other barriers are also important explanatory factors. We find that, even after taking into account nominal exchange rate variability, distance between cities and the border continue to have positive and significant effects on real exchange rate variability. We also find that currency attacks had major disintegration effects by considerably increasing these border effects, and by raising within country relative price dispersion in emerging market economies. These effects are found to be quite persistent since relative price volatility across emerging markets today is still significantly larger than a decade ago.

The rest of the paper is organized as follows. In the next section, we will describe our data set of regional CPI data. In section 3 we report some descriptive statistics and in section 4 we will shortly describe our estimation approach. Section 5 examines the relative size and potential determinants of border effects across emerging market economies in the 1990s. In section 6, we examine the disintegration effects of the major currency crises of the 1990s. In section 7, we use our so-called 'EMU'- and 'Pacific' sample to check the robustness of the results from the previous sections. Section 8 concludes.

2 Data Description

As outlined in the introduction, this study wants to examine possible disintegration effects of major currency crises of the 1990s. The empirical literature on examining the degree of integration across goods markets has basically used two types of data: bilateral trade data and price data. When bilateral trade data are used (as in McCallum (1995)) integration between markets is said to be high when the trade volume between these two markets is large. However, the trade volume is - as

Engel and Rogers (2000) point out - a problematic measure for integration: When trade is, as the traditional trade theory assumes, determined by relative factor endowments and these endowments do not differ much across two markets, then we would not expect much bilateral trade to take place between these markets even if they are perfectly integrated. For this reason the analysis in this paper relies on the second approach to measure integration, i.e., price data. As mentioned above, we are using consumer price index (CPI) data from 205 locations in 21 countries in America, Europe, Asia and Oceania. The data are monthly,[1] covering the period from January 1991 to June 2001. Table A lists the locations for which we have available data,[2] and table B lists the short names for the countries that we are using throughout the paper. As table A shows, our regional data cover both major industrialized (amongst them five of the G7 countries) and emerging market countries. The latter include the MERCOSUR countries Argentina and Brazil and the Asian 'tiger' countries. Japan is not classified as an 'Asian' country but assigned to the group of 'Pacific' countries that additionally includes Australia and New Zealand. We exclude Japan from the group of Asian countries as we consider it to be at a much more advanced stage of economic development than the other Asian - so-called emerging market - countries. As the last row of table A indicates all data are from official sources (mostly from the national statistical offices, central banks or related sources) such that we think that data integrity is not a major issue in our study. The nominal exchange rate data used in our study are monthly averages and are taken from the IMF's International Financial Statistics database.
Figures 1 and 2 display the national inflation rates and the regional inflation diversity for a selected number of countries in order to highlight the degree of regional heterogeneity in the inflation response to currency crises. From panel (c) of table 1, it is obvious that during the Mexican crisis of 1994 the sharp increase in inflation levels also resulted in a noticeable rise in inflation dispersion across Mexican locations. The same pattern can be identified for Thailand, Indonesia, Korea and the Philippines during the Asian crisis in the second half of 1997. Interestingly, the Asian crisis is also visible in the Indian and Japanese inflation series, which display a similar pattern during this period. We will consider this effect in more detail when we discuss contagion effects later in the paper. From this observation, we can, however, already draw one lesson that is important for our purpose: Currency crises are

[1] For the U.S.A., for some cities data are only available for odd months or for even months. In the 'Pacific sample', we moved to quarterly data since CPI data for Australia and New Zealand are available at that frequency only. See section A for details.

[2] In many countries we had data for more locations available than were used in this study. Our selection was then motivated by two major aspects: to obtain a relatively broad regional coverage whilst at the same time aiming at using large cities with a high population number. We view the latter as a good indicator for market size, and larger markets are typically associated with more competitive price setting.

not only characterized by sharp changes in nominal exchange rates but are - very often - also accompanied by large changes in national prices. As real exchange rate changes are the sum of nominal exchange rate changes and relative national price level changes, this observation means that the link between nominal exchange rates and real exchange rates might be looser in times of currency crises than it has been observed, e.g., by Mussa (1986) for industrialized countries during 'quiet' periods (i.e., for periods in which no currency crises occur). As studies for high-inflation periods (see, e.g., Frenkel (1978)) indicate, PPP tends to hold better during these periods than during relatively 'quiet' times.

To our knowledge, spatial CPI data for emerging market economies were not used in previous research, and even the spatial data for some of the industrialized nations included in our paper are employed for the first time in the literature. Using price indices from 205 locations would in principle allow us to construct 20,910 (=205*204/2) bilateral relative prices. Furthermore, our sample of 21 countries implies that the cross-border city pairs lie across one of 210 (=21*20/2) national borders (that are not necessarily adjacent). To keep the econometric part of our analysis computationally manageable, we split our total sample in three subsamples: a 'U.S. sample', an 'EMU sample' and a 'Pacific sample'. All samples include the emerging market economies (incl. Japan) but differ with respect to the included industrialized countries and the chosen base currency. The U.S. sample includes the U.S.A. and Canada in addition to Mexico, Japan, the Southern American and Asian countries. The EMU sample replaces the U.S.A. and Canada by our European countries. In the Pacific samples, the European countries are replaced by Australia and New Zealand. Note that there are a number of different types of exchange rate arrangements determining the nominal exchange rates of our 210 country pairs. Germany was at the heart of the Exchange Rate Mechanism (ERM) of the European Monetary System (EMS), which was a system of multilateral pegs and developed into a currency union in 1999. Argentina, for part of our sample has tied its currency to the U.S. dollar by operating a currency board system. Most Asian countries have operated unilateral pegs vis-à-vis the U.S. dollar before the Asian crisis and were forced to float their exchange rates as a result of the currency attacks. In our empirical estimates we will consider in more detail the characteristics of these exchange rate systems by introducing a number of dummy variables for currency board arrangements, unilateral pegs, free floats, managed floats, currency unions, etc. in order to examine the 'hollowing out' (Eichengreen (1999)) hypothesis empirically. A recent analysis of the role of the exchange rate system in explaining economic integration as measured by bilateral trade volumes is found in Rose (2000), Rose (2001), Persson (2001), Parsley and Wei (2001b) and the literature cited there. Our paper follows Engel and Rogers (1996) and analyzes the impact of the exchange rate system on economic integration as measured by relative price volatility across locations within and between countries.

We are aware that there are other important determinants of economic integration between countries in addition to distance, national borders and the exchange rate system. One key factor is the existence of formal free-trade arrangements. Some of the countries under study were members of free-trade areas such as the European Union (EU), the North American Free Trade Arrangement (NAFTA), the South American MERCOSUR or the ASEAN agreement. Membership in such arrangements should have a negative effect on relative price volatility since the literature has shown that a significant link exists between trade linkages, economic integration and relative price volatility. Finally, other potentially important determinants of economic integration are cultural factors, such as a common language or a common history.[3] In our empirical work we will allow for these influences in addition to controlling for distance and the existence of a border when estimating the impact of currency crises on economic integration as measured by relative price volatility.

3 Some Descriptive Statistics

To analyze how market integration has been affected by the currency crises of the 1990s, we employ three different measures of relative price volatility that all rest on the idea that larger deviations from PPP are associated with lower integration. Let q_{ij} denote the log of the CPI in location i relative to that in location j. For our base sample - the U.S. sample - all prices are denominated in U.S. dollars.[4] Our first - and basic - measure is given by the standard deviation of changes in q_{ij} across locations. We consider two-month changes in relative prices, Δq_{ij} and we measure volatility as the sample variance, $V(\Delta q_{ij})$.

As mentioned above, this measure is computed for each of the city pairs included in the sample. As described in more detail in section A, the U.S. sample consists of 149 regions from 15 different countries. Using the 149 included regions we are able to construct 11,026 ($= 149 * 148/2$) relative price series. The 11,026 measures represent either an *intra-national* region pair (when both regions are located in the

[3]The 21 countries used in this study also differ along geographic, linguistic, and cultural lines. In our sample Portugal and Brazil share a common language. The same is true for Spain, Argentina, Mexico, Columbia, and Bolivia on the one side, and the United States, Canada, Australia, New Zealand and India on the other. Many countries in our sample share a common border with at least one adjacent country, some have joint borders with two or more neighboring countries and the third group of countries have no common borders with any other countries in the sample. Note that our study takes explicit account of such geographic factors (common borders, physical distance) and cultural linkages (common language, which may contribute to explaining economic integration between countries.

[4]As indicated, we also employ a Europe-based (DM-based) and a Pacific-based (Yen-based) sample to check the sensitivity of the results with respect to the choice of the numeraire currency.

same country) or an *international* region pair (when the two regions are located in different countries). Each international observation can be assigned to one out of 105 ($= 15 * 14/2$) bilateral country pairs that can be formed out of our 15 included countries. Our regression analysis is based on the cross-section of all 11,026 volatility measures.

A key feature of our analysis is that we draw a distinction between cases where both locations are within the same country (labelled intra-national), and cases with one city in one country and the other city in a foreign country (labelled international). We also distinguish between the cases where both locations are located in the same continent (*intra-continental*) and those cases where they are located in different continents (*inter-continental*). This distinction was introduced by Engel et al. (1997). For the U.S. sample, we obtain four intra-continental (within North America, within South America, within Asia and within Pacific) and six inter-continental groups (North America - South America, North America - Asia, North America - Pacific, South America - Asia, South America - Pacific and Asia - Pacific) from this classification. Other useful ways to characterize the global linkages between the various locations is to distinguish between industrialized and emerging market economies or to follow Masson (1999), who in his study of the Asian crisis analyzed 'monsoonal effects', that is, the spill-over between Asian and Southern American emerging markets, whilst referring to the spill-over within Asia as 'contagion effects'.

Table 1 and tables C and D of the appendix present some descriptive statistics for the U.S. sample. In table 1, summary results for our international observations and the various continental groups are presented. For all periods we find that average intra-national relative price volatility is considerably lower than average cross-border volatility both within and between continental blocs. Intra-national volatility is also fairly constant and does not display a downward or upward trend; rather, it fluctuates around its total period average of 10.93 (std.dvt. 5.89) during the four subperiods. Table 1 also reveals a relatively low initial intra-continental volatility in North America (20.40, std.dvt. = 2.46) and a moderate inter-continental volatility between North America and Asia (31.82, std.dvt. = 17.57). Relative price volatility between North America and South American or the Pacific regions are somewhat higher and of similar size as the intra-Asian volatility (38.89, std.dvt. = 19.52). Finally, note that the highest intra-continental volatility is initially found for city pairs in South America (46.63, std.dvt. = 11.10). The three major currency crises drastically disturb this volatility pattern and are clearly identifiable both in the volatility within these continents and between these continents and the rest of the world.

Tables C and D provide more detailed descriptive statistics for the individual country-pairs. The reported figures give us an insight into the heterogeneity of segmentations across markets within a continent group. Due to space restrictions, we focus on the pre-Mexican crisis period (1991.01- 1994.11) here. Tables C and D confirm that the average volatility of cross-border pairs of 2-month relative price changes is noticeably larger than the average variance of within-country pairs. Consider the case of North America. Within Canada, the United States and Mexico, city pairs exhibit a low average volatility between 4.08 and 6.88, whilst the cross-border averages between Canada, Mexico and the U.S.A. range between 17.57 and 22.79, which is roughly three times as large. Within-country volatility in many Asian and Pacific countries (Japan, Korea, Malaysia, and Thailand) is of comparable size to that in North America, but in Southern America (Argentina, Bolivia, Brazil, Columbia) and in some parts of Asia (India, Indonesia) it reaches almost the size of the U.S.-Canadian cross-border relative price volatility. The largest volatility measures are found for the inter-continental cross-border city pairs between emerging market economies in South America and Asia, and in particular in relation to India. The largest volatility measure reported in tables C and D is 69.14 for the inter-continental country pair Brazil-India, which is roughly four times as large as the corresponding U.S.A.-Canada number.

Figures 3 and 4 provide an even closer look at our data for the pre-Mexican crisis period (1991.01 - 1994.11) by displaying the relative price volatility between our city pairs in twelve separate graphs for the various intra-national, intra-continental and inter-continental combinations. For completeness and with reference to our robustness analysis in section 7, we also included within-continental dispersion measures from our EMU and Pacific sample. In the individual panels, we plot our measures of integration obtained for the respective continental group versus the (log)distance between the included regions. Looking at panel (a) of figure 3, we can see that there is a positive relationship between integration and distance for intra-national relative prices. However, as the international panels show, distance alone does not explain all dispersion: Given the same distance, relative price dispersion across regions located in different countries is usually higher than that across regions located in the same country whereby the degree to which differences exist essentially depends on the considered country pairs. Comparing panels (a) and (b) of figure 3 reveals that some intra-national city pairs have a price volatility that is as high as that of the North-American intra-continental city pairs, but the latter tend to lie further apart. In all other panels of figure 3, i.e., for all other intra-continental groups, most observations lie above the intra-national values. It is also obvious from panels (c) and (d) of figure 3 that at roughly the same distance as in North America the South American and Asian intra-continental city pairs display a much larger relative price volatility. Except for the Asian-Pacific panel the inter-continental city pairs lie even further apart and also have higher volatility, but there are quite diverse patterns. To summarize, at a first glance the data appear to support the hypothesis of Engel and Rogers (1996) that a high relative price volatility between very distant city pairs is a good indicator of a low degree of economic integration.

4 Methodology

To examine the existence and dynamics of border effects across emerging market economies we follow the standard methodology in the literature that has been initiated by Engel and Rogers (1996). This approach examines the hypothesis that the degree of integration across geographically separated markets is positively related to the distance between the locations and other explanatory variables, including a dummy variable for whether the cities are located in different countries. The dependent variable, denoted as $V(\Delta q_{ij})$, is given by our measure of the size of relative price dispersion across regions. Due to a lack of better data, distance is used to capture the 'transaction costs of arbitrage' that include, e.g., transportation, information and marketing and distribution costs. Formally, we estimate regression equations of the form:

$$\begin{aligned} V(\Delta q_{ij}) &= \sum \alpha(c)D(c) + \beta \ln(d_{ij}) + \delta B_{ij} + \\ &\quad + \sum \gamma(a) X_{ij}(a) + u_{ij}. \end{aligned} \tag{1}$$

Alternatively, we replace the log-linear distance specification by a quadratic form and test equations of the form:

$$\begin{aligned} V(\Delta q_{ij}) &= \sum \alpha(c)D(c) + \beta_1 d_{ij} + \beta_2 d_{ij}^2 + \delta B_{ij} + \\ &\quad + \sum \gamma(a) X_{ij}(a) + u_{ij}. \end{aligned} \tag{2}$$

In these equations, $D(c)$ is a dummy variable for each city in our sample, d_{ij} is the distance between cities i and j, B_{ij} is a dummy variable for each national border that separates cities i and j and the term $\sum \gamma(a)X_{ij}(a)$ represents other explanatory variables.

The primary candidate to explain relative price dispersion is nominal exchange rate volatility, denoted as $V(\Delta s_{ij})$, where s_{ij} is the nominal exchange rate between cities i and j located in different countries. Beyond a measure of nominal exchange rate volatility, the term $\sum \gamma(a)X_{ij}(a)$ represents other explanatory variables, such as a dummy variable for permanently floating exchange rate systems or a dummy for the existence of formal free trade arrangements (NAFTA, EU, ASEAN, MERCOSUR). Note that all regressions are cross-sectional, and we would have been able to use a maximum of 20,910 observations. To keep the computational task manageable, we will focus much of our analysis on a U.S.-based cross-country sample with only 11,026 city pairs and check the sensitivity of our results by also employing a Europe-based sample (13,861 city pairs) and a Pacific-based sample (10,878 city pairs). Note that the inclusion of separate dummies for each individual location allows the variance of price changes to vary from city to city. That is, for city pair (i, j) the dummy variables for city i and city j take on values of 1. This takes into account the possibility of idiosyncratic measurement errors or seasonalities in some cities that may make their prices more volatile than others. Additionally, it allows us to control for differences in methodologies for recording prices that lead to greater discrepancies in prices between locations in one country compared to the other.

Following Engel and Rogers (1996) we hypothesize that there is a negative relationship between distance and goods market integration. As equations (1) and (2) show, we are using two different approaches to capture the relationship between distance and relative price dispersion. When our underlying intuition of including distance in the regressions is correct, then we would expect the coefficient β to be positive in equation (1). When using equation (2), we should find $\beta_1 > 0$ and $\beta_2 < 0$. When using distance as a proxy for transaction costs of arbitrage there is one important caveat to take into account: Distance will work as a proxy for transaction costs (that we interpret to include any factors that make it more costly to sell goods in one location compared to another) only when there is a stable relationship between the two variables. When this relationship is disturbed within the sample period for some reasons (e.g., by policy shocks like oil tax increases) then we might observe relatively volatile measure for the distance coefficient. Due to a lack of an alternative - and as it has turned out to work relatively well most of the time - we will stick to it, nevertheless.

The dummy variable B_{ij} takes the value one when cities i and j are located in different countries and the value zero otherwise. It is used to capture the effect of national borders on integration. When this variable takes a significantly positive value, then we can conclude that international markets are more segmented than national markets. There are various reasons why we expect the border dummy to be relevant. The recent literature on pricing to market, e.g., has shown that pricing to market takes place and it has emphasized that mark-ups are likely to differ across locations and may vary with exchange rate changes. Other explanations for border effects include the existence of tariffs and other trade restrictions that impose direct costs of crossing borders when trying to exploit arbitrage opportunities. In addition, there may be more homogeneity in relative productivity shocks for city pairs within the same country than for cross-border city pairs, so that cross-border pairs have more price volatility. Another - very promising - explanation is given by the existence of short-run sticky national prices in conjunction with highly volatile bilateral nominal exchange rates. Take, e.g., the case that goods sold in Japan have sticky prices in Yen terms and goods sold in the United States have sticky prices in U.S. dollar terms, whilst the nominal exchange rate is highly variable. In this case, the cross-border prices would fluctuate along with the exchange rate, but the within-country prices would be fairly stable. The included variable B_{ij} will capture all of these factors.

To gain some insights into the relative importance of some of the above listed factors that might be responsible for the existence of border effects we will include additional variables. The impact of trade barriers on integration will be examined by including dummy variables for free trade arrangements across countries. We will, e.g., add a dummy variable for NAFTA, EU, MERCOSUR and ASEAN. When trade barriers play a role, then we would expect these variables to be significantly negative. To capture the impact of nominal exchange rate volatility in the presence of rigid national prices we include a variable for the volatility of nominal exchange rates. We are expecting this variable to be highly positively significant. Additionally, we analyze the impact of nominal exchange rate arrangements by constructing dummy variables for pegs and/or independent floating. Looking at a decade of data, it will be interesting to assess the 'performance' of different exchange rate regimes in terms of average relative price dispersion.

In the following section, we turn to our evidence on the existence and relative size of border effects across emerging market economies and industrialized countries and on the role of nominal exchange rate volatility, exchange rate and trade arrangements for these border effects.

5 Examination of Border Effects in Emerging Market Economies in the 1990s

5.1 Size of Border Effects and the Role of Exchange Rate and Trade Arrangements

Our regression analysis starts by assessing the role of distance and national borders for relative price dispersion across emerging market and industrialized countries, when data for the full decade of the 1990s are used. Additionally, we are examining the role of geographic factors ('landlocked'), the nominal exchange rate regime and of trade arrangements. Table 2 presents the results from ten different specifications that were estimated to shed some light on these issues. In specification (1), we estimate equation (1) when only distance and one aggregate border dummy for all international region pairs is included. As we hypothesized, we find that distance has a significantly positive impact on relative price dispersion. This supports the idea that transaction costs represent impediments to trade that generate a band of inactivity around the equilibrium within which no arbitrage takes place. However, distance does not explain all observed relative price dispersion: National borders also significantly contribute to relative price volatility. Their relative importance is almost twenty times larger than that of distance. In the metric developed by Engel and Rogers (1996), we would say that the border across our sample countries has a width of around 210 million ($= exp(65.57/3.34)/1.6$) miles. This is almost 3,000 times the width that Engel and Rogers (1996) found for the U.S./Canadian border but it is by far much less than the value (43,000 trillion miles) that Parsley and Wei (2001a) found for the width of the U.S./Japanese border.[5]

What explains the size of this border effect? Nominal exchange rate variability - in conjunction with short-run rigid national prices - is a prime candidate. Given the large fluctuations of nominal exchange rates that accompany currency crises, this variable might play an even larger role than under normal circumstances. Regression results when a measure for nominal exchange rate volatility (the standard deviation of two-month changes in the exchange rate between two locations) is included in the regression equation are presented as specification (2) in table 2. For our overall sample, the coefficient on nominal exchange rate variability is 0.354 ($t - stat. = 13.85$). Including nominal exchange rate variability substantially weakens the effect of the border dummy, whose point estimate falls from 65.57 to 29.06. This suggests that a very large part of the border effect stems from variable nominal exchange rates under sticky prices. However, even with the variable $V(\Delta s_{ij})$ in the regression, the border dummy remains positive and significant with a t-statistic exceeding 17. The distance coefficient drops slightly in value but remains strongly significant. These results let us conclude that the significance of border effects is not exclusively the result of nominal exchange rate volatility, and that other factors appear to also matter.

To identify such factors, we have augmented our baseline regression (following the approaches taken in the estimation of the gravity model of trade or in the empirical growth literature) by including geographic factors (landlocked) as well as indicators of the exchange rate regime (permanently free float) and trade arrangements (EU, NAFTA, ASEAN, MERCOSUR). The results are reported as specifications (3) to (10). The first specification that we test examines the potential role that marketing and distribution costs play for relative price dispersion. Based on Engel and Rogers (1998) who "speculate that integrated marketing and distribution systems within regions cause LOOP to hold more nearly intra-regionally", we examine the hypoth-

[5] This large spread in the estimated values for the width of the border clearly demonstrates one shortcoming of the metric by Engel and Rogers (1996): Given the log-linear specification of the distance function, already relatively small changes in the estimated value of either the distance or the border coefficient result in large changes in the implied width of the border.

esis that neighboring countries have - on average - a lower relative price dispersion due to the reason given in the above quote. We do so by adding the variable 'landlocked' that takes the value one when two countries share a common border. The country pairs for which this variable takes the value one are us-ca, us-me, ar-bo, ar-br, bo-br, indo-th, indo-ma, indo-ph, ma-th and ma-ph.[6] The result basically supports our hypothesis: The landlocked variable has a negative sign and is highly significant. Furthermore, neither the border nor the nominal exchange rate variable are strongly influenced by the inclusion of the landlocked variable. However, distance that is supposed to capture marketing costs as well, drops considerably in value, but stays significant nevertheless.[7]

Specifications (4) to (9) of table 2 examine the impact of free trade arrangements (actual and 'hypothetical') on integration. As free trade arrangements are supposed to foster trade across member countries, we expect the added indicator variables to have a negative sign. In specification (4), we add a NAFTA dummy that takes the value one for all international region pairs where both regions are located in a NAFTA country. Contrary to our expectations, the variable for the NAFTA dummy is positive and not significant. Thus, NAFTA does not seem to have contributed to integration between Mexican, U.S. and Canadian markets. This result is in line with recent evidence by Rogers and Smith (2001) who also find no integration effect of NAFTA. As is true for all further specifications considered, the coefficients on distance, border and nominal exchange rate volatility are not much affected by the inclusion of the additional NAFTA dummy.

In specification (5) we additionally add an ASEAN dummy variable that takes the value one for all international location pairs where both regions are located in an ASEAN country (Indonesia, Malaysia, the Philippines and Thailand). As we expect, the variable is not only negative but also significant. In other words, ASEAN seems to have had a positive impact on integration across member countries. In specifications (6) to (9), we 'experiment' a little bit with the ASEAN dummy by ex-/including other Southeast-Asian countries. This is supposed to help us figure out whether we can identify - in the line of Frankel et al. (1995) and Engel and Rogers (1998) - a regional 'integration' bloc across Southeast-Asian countries. We start doing so by excluding Indonesia from the ASEAN dummy variable as this country was particularly hardly hit by the Asian currency crisis. As we supposed, the dummy variable increases in absolute value (and significance) indicating that the remaining ASEAN countries (Malaysia, the Philippines and Thailand) are more closely con-

[6] See table B for an explanation of the used country short names.

[7] We are aware, that the negative sign of the coefficient on 'landlocked' cannot necessarily be seen as fully convincing evidence for the model by Engel and Rogers (1998) since we are not able to distinguish between the integration effects of regionally integrated distribution and markets systems and free trade agreements as, e.g., between the U.S.A. and Canada or Argentina and Brazil.

nected to each other than they are to Indonesia. When we include South Korea in the ASEAN dummy, we find that the dummy takes an even larger negative value indicating that South Korea fits relatively well to the ASEAN countries. This is true to a much smaller degree for India as specification (8) shows. Overall, the ASEAN countries (including South Korea) seem to be better integrated than other emerging market economies.

In our last specification, we are trying to assess the role of the nominal exchange rate arrangement on relative price dispersion. This could be done in several ways. One way to do it is to construct a dummy variable ('float') that takes the value one for all country pairs that had independent floating throughout the 1990s. Thus, this variable will tell us whether the average relative price dispersion between countries that had independent floating throughout the 1990s has on average been lower, higher or equal to the average relative price dispersion for countries that had temporarily or permanently fixed their exchange rate in this decade. A priori, the expected sign of this variable is not clear to us: On the one hand, countries that have free floating experience higher volatility in nominal exchange rates that in turn is related (see, e.g., Mussa (1986) for prominent evidence) with higher relative price dispersion in the short-run. On the other hand, many countries that had fixed their exchange rate to another country experienced currency turbulences in the 1990s. These turbulences are in turn related to extremely large short-run swifts in relative prices. The results in table 2 show that the former effect dominates, i.e., countries that fix their exchange rates relative to the currency of another country experience, on average, lower relative price volatility although they are very likely to be subject to currency crises. This might be one of the reasons why we still observe a tendency of emerging market countries to fix their exchange rates (sometimes denoted as 'fear of floating') relative to a stable currency (mostly the U.S. dollar).

To check the sensitivity of our results we employ two alternative measures for relative price dispersion across markets. Volatility measure 2 is constructed as the spread between the 10th and the 90th percentile of the distribution of two-month changes in relative prices between two locations. Volatility measure 3 is constructed as the standard deviation of the two-month ahead in-sample forecast error of each relative price series (whereby forecasts are based on an AR(6) process). Tables 3 and 4 show that all of our results are confirmed for the two alternative measures of integration: We again find that both distance and the border significantly contribute to the dispersion of relative prices across locations. Their impact remains significant, even after we control for nominal exchange rate volatility that has a very large effect on relative price volatility. NAFTA's impact on integration is relatively small, for ASEAN countries we find a much larger impact. Countries that have permanent floating seem to have - on average - a slightly higher relative price volatility than countries that - at least temporarily - peg their exchange rates even if they are subject to currency crises.

5.2 Dispersion of Border Effects across Countries

In the last subsection, we quantified the size of the border effect across emerging market and major industrialized countries (U.S.A., Canada and Japan) and examined the role of some of its potential determinants. In section 4, we listed several factors that might induce relative prices to be significantly larger for regions that are located in different countries than for regions that are located in the same country. We saw that these factors play a very important role but cannot explain all of the existing border effects. To examine the role of other factors such as nationally varying productivity trends or nationally segmented labor markets, additional regional data (output data, wage data, rents, etc.) would be required. However, these data are not easily available, particularly not for emerging market economies. What we can do, however, is to examine the relative size of border estimates across individual country pairs.

In doing so, we replace the aggregate border dummy variable from equation (1) with individual border dummies. For the U.S. sample, this means to replace one border dummy with 105 ($= 15 * 14/2$) individual border dummies. Unfortunately, when doing so, an additional assessment of, e.g., the role of nominal exchange rate volatility is no longer possible as such a variable would be perfectly collinear with the individual border dummies. Detailed results for the individual border dummies (when the overall sample period is considered) are presented in columns two and three of table E, summary results are available in columns two and three of table 5. The results show, that there is a large dispersion in estimated border effects across countries. However, there is one commonality between all border coefficients: They are all positive and highly significant. Our results thus confirm the basic findings from the literature. Integration depends on distance, however, distance alone cannot explain all of the observed relative price dispersion. Instead, national goods markets seem to be largely segmented.

The degree of market segmentation significantly depends on which markets are considered. The smallest segmentations are found - not surprisingly - for the us-ca country pair and - more surprisingly - for the country pairs us-ar, us-bo, ca-ar, ca-bo and ar-bo. The latter results reflect the fact that both Argentina and Bolivia had pegged their currencies to the U.S. dollar in the sample period.. The largest estimated border effects are found for all bilateral combinations that include Indonesian regions (with estimated values that are as much as 15 times larger than that obtained for the U.S.-Canadian border).

Looking at country blocs (table 5), we can see that average values differ considerably across continental blocs with the lowest value being found for within-South-American location pairs (with an average value of 32.99), followed by North-American-South-American location pairs (39.62) and within-North-American location pairs (39.70). The largest value is found for within-Asian location pairs (65.30). As for the mean values, also the dispersion of estimates across country pairs differs considerably across continental blocs. There seems to be a weak relationship between the estimated mean value of the border effect and its dispersion across country pairs: The most homogeneous values are found within South America, the most heterogeneous estimates exist across Asian countries. Although our sample comprises three major currency crises (the Mexican crisis in 1994, the Asian crisis in 1997 and the Brazilian crisis in 1998), these results indicate that the most severe of them - in terms of disintegration effects - has been the Asian crisis whereas the other two crises have had relatively little negative impact on global goods market integration.

Overall, our results indicate that South American markets, North American markets and North versus South American markets are relatively well integrated (although large differences exist) and that Asian markets are least integrated. When performing sensitivity analysis by using either measure 2 or measure 3 or by substituting the log-linear distance function by a quadratic distance function or by deflating all variables by distance to account for possible heteroscedasticities in error terms (that are positively related to distance) these findings are confirmed. The results from these exercises are presented in tables 6, F, G, H and I. In the next section, we will take a closer look at the effects of the individual currency crises of the 1990s by examining the dynamics of border effects across subperiods.

6 Disintegration Effects of Currency Crises

To study potential disintegration effects of emerging market currency crises, we divide our total sample into four subsamples: the pre-Mexican crisis period (1991.01 - 1994:11), the pre-Asian crisis period (1994:12 - 1997:06), the pre-Brazilian crisis period (1997:07 - 1998:12) and the post-Brazilian crisis period (1999:01 - 2001.06). Summary estimation results for regression equation (1) and volatility measure 1 are reported in columns four to eleven of table 5, individual border estimates are presented in columns four to eleven of table E.

Let us consider the pre-Mexican crisis sample first. Due to problems with data availability for Taiwan in the early sample there are only 91 ($= 14 * 13/2$) individual border dummies included in the regression. All of them have the expected sign and are significant. The coefficient on the border dummies ranges between 2.40 for the U.S.-Indonesian border and 58.42 for the Columbian-Malaysian border, which is almost 25 times larger. Note that the smallest border estimates are found in all bilateral combinations between the United States, Indonesia, Thailand, Malaysia and South Korea. Our simple border metric indicates that these countries, which a few years later were at the core of the Asian currency crisis, had a considerably higher degree of economic integration with the United States than Canada, for which we estimate a border coefficient of 11.28.[8] Likewise, we find relatively small border effects between the U.S.A. and the South American countries Argentina and Bolivia. We attribute this to the pegging of these countries' currencies (though done in different forms) to the U.S. dollar in the early 1990s. It is remarkable that, although border effects are estimated to be relatively moderate, the values are highly significant nevertheless. That confirms our previous result that nominal exchange rate volatility plays a crucial role but cannot explain all of existing border effects. In line with these findings is the observation that the highest border values are found for country pairs whose bilateral exchange rates exhibit a large degree of volatility. Bilateral Japanese combinations, e.g., generally show relatively high border estimates reaching from 20.38 for the Japanese-Malaysian border to 56.23 for the Japanese-Indian border. Looking at the summary results in table 5, we can see that average border estimates differ considerably across continental blocs (between 14.18 for within-North-American country pairs to 35.00 for South-American-Pacific country pairs). Looking at the dispersion of border estimates across country pairs within continental blocs we observe a much smaller degree of heterogeneity than for the total period. This is particularly pronounced for NAFTA countries (with a standard deviation of 3.17) and for bilateral Japanese-North/South-American country pairs (with a standard deviation of 4.89 and 5.56, respectively). For NAFTA countries this probably reflects the pegging of the Mexican currency to the dollar during this period whereas for the Japanese-American groups it is due to the dominance of the highly nominal yen exchange rate. In total, the positive and significant estimates of the border effects confirm the results documented by Engel and Rogers (1996) and Engel and Rogers (2001) that crossing an international border adds considerable volatility to relative city prices, even after accounting for the effects of distance and city-specific characteristics.

What impact did the various exchange rate crises have on these initial conditions? The remaining columns of tables 5 and E report our estimates for the Mexican, Asian and Brazilian currency crises. The immediate impacts of the Mexican currency crises are presented in columns six and seven. As nominal exchange rate volatility considerably contributes to observed border effects, we expect bilateral Mexican border pairs to experience drastic increases. Referring to the above mentioned contagion

[8]Our results in this section, which disregard European and Pacific locations identify eighteen bilateral country pairs which were more integrated with each other than the U.S.A. and Canada were during 1991.01 - 1994.11.

and moonsoonal effects, an interesting question is whether we will be able to identify an impact of the Mexican crises on other - non-Mexican - border effects. To get a better intuition for the results, panel (a) of figure 5 visualizes the results. In this figure, we provide a scatter-plot of our measure of relative price volatility computed for the pre-Mexican and post-Mexican crisis period. Since most of the observations lie below the 45° line, our border metric indicates progress in economic integration for most included countries across these two subperiods. The major exception are the bilateral combinations with respect to Mexico and Japan. Whilst for Mexico this disintegration is clearly due to the currency crisis, the Japanese volatility pattern cannot be viewed as an outcome of this crisis. Rather, a lack of progress on liberalizing trade and a weak and volatile yen are at the core of these disintegration effects. Looking at the results in table E we find - as in the pre-Mexican crisis sample -, that both distance and most bilateral border effects are significant during the Mexican-crisis sample. Additionally, the lowest border estimates are - as for the pre-Mexican crisis sample - found for Asian and South American countries that had pegged their currencies vis-a-vis the dollar during this period. However, most border coefficients (with the exception of the U.S.-Argentinean border) are positive and highly significant. A glance at the summary statistics in table 5 reveals a pattern comparable to that of the pre-Mexican crisis period. The only exception are Mexican estimates. Thus, the Mexican crisis exhibits a clear local pattern with no indications of contagion or moonsonal effects.

A vastly different picture is revealed for the Asian crisis period (1997.07 - 1998.12). In panel (b) of figure 5, we provide a comparison of our border estimates for the Mexican-crisis and the Asian crisis periods. Whilst the Mexican crisis was clearly identified as a local crisis primarily affecting the country under attack by currency speculators, the Asian crisis was a truly global phenomenon. According to our metric it brought about major disintegration effects that were no longer contained regionally. The most drastic effects are identified for Indonesia, which experiences a major surge in inflation and a vast decline in its U.S. dollar exchange rate. Another country hit hard by the Asian crisis is Korea, followed by the Philippines and Thailand. Looking at the estimation results for this subperiod (columns eight and nine of tables 5 and E), we can make an attempt to 'quantify' the impact of the currency crises on integration. Table 5 shows that the average within-Asian border estimate 'explodes' from 13.11 to 150.45 (that is increases by a factor of eleven), the corresponding South American-Asian value increases from 13.55 to 130.74 (factor: ten), for North America-Asia we observe an increase from 29.51 to 131.56 (factor: 4.5) and for Asian-Pacific pairs we find a 'moderate' increase from 48.93 to 123.52 (factor: 2.5). Interestingly, all bilateral Asian border estimates are now relatively close together (at a value of around 130) reflecting the dominance of the 'nominal' part in estimated border effects during this period. When looking at the dispersion of border estimates for within-continent groups, we can observe a drastic increase that is particularly pronounced for the within-Asian country pairs (from 6.32 to 99.30). This shows that the crisis has induced a large degree of heterogeneity across Asian countries. Whereas estimated border effects increased for most countries in our sample in Asian crisis period, Mexico which in the later part of the 1990s stabilized and in part recovered from the 1994 crisis, experienced some integration progress during this period. However, most estimates have not reached their pre-Mexican crisis level yet. This finding raises the issue of how persistent the disintegration effects of the currency crises were. Before we turn to this question in some more detail, we shortly consider the results for the last subperiod, i.e., the Brazilian crisis period.

The pattern of the estimates for the Brazilian crisis period is very similar to that for the Mexican crisis period.[9] Looking at columns ten and eleven of tables 5 and E, we can see that the Brazilian crisis has had a local character. Bilateral Brazilian border estimates make a big jump (the U.S.-Brazilian border estimate, e.g., increases by a factor of 35 from 1.66 to 58.49) illustrating again the large importance of sticky prices in conjunction with volatile nominal exchange rates for observed border effects. Compared with the Asian crisis period, Asian border estimates reduce largely, but remain well above their pre-Asian crisis level. In other words, even almost three years after the crisis we can still observe disintegration effects. A glance at Mexican estimates supports this conclusion.

To shed more light on the question of how persistent the consequences of currency crises for integration are we compare the degree of integration across our sample countries before and after the crises. Figure 6 - that plots our pre-Mexican crisis (1991.01 - 1994.11) versus our 'post'-crisis (1999.01 - 2001.06) border estimates - addresses this question. When we compare the early subsample (x-axis) and the most recent estimates (y-axis), we see that - apart from bilateral Indian border estimates - most observations lie above the 45° line. This means that obtained border estimates have a higher value at the end of the decade than they had at its beginning. In other words, our measure of economic integration today still has not fully recovered from the successive crises in Mexico, Asian and Brazil, but at the same time considerable progress has been made to recover from the negative global impact of these crises.

So just how damaging are currency crises? Whilst the cross-country estimates of border effects are very sensitive with respect to nominal exchange rate movements, a robust indicator of the disintegration effects of currency attacks is provided by the within-country effects of the crises on relative price volatility between city pairs.

[9] Unfortunately, we do not have Argentinean data available for this subperiod. It would have been interesting to examine to which degree the Brazilian currency crisis has had an impact on the Argentinean-Brazilian border effect. As both MERCOSUR member countries have close trade relations we might have observed indications of contagion effects.

Figure 7 displays these volatility measures for the above subperiods. In panel (a), we plot the average intra-national dispersion of our sample country for the Asian crisis period (1997.07 - 1998.12, y-axis) versus the pre-Asian crisis period (1994.12 - 1997.06, x-axis). We find that the within-country disintegration effects closely resemble the cross-country effects discussed above. For example, during the Asian crisis the within-country disintegration effects are particularly pronounced for Indonesia and India, and the latter finding clearly witnesses contagion within Asia. We interpret these findings as follows: Whilst a large part of the cross-country evidence might be due to a nominal border effect working through the exchange rate, the former effect is a truly real effect that arises from an impact of the crisis on price dispersion within countries.

To check the robustness of our results we additionally performed some sensitivity analysis. More specifically, we tested how sensitive these results are with respect to changes in functional forms of the distance specification or the particular volatility measure employed. To address this issue, we conducted numerous sensitivity checks, but due to space constraints we will only briefly discuss four such modifications. For the overall period (1991.01 - 2001.06), columns two and three of table 6 (summary results grouped by continental pairs) and table F (detailed results on estimated individual borders) display the results when the distance function is quadratic, rather than logarithmic. Using a quadratic specification is interesting as it allows for a test of our assumption of a concave distance relationship. We find that distance has a significantly positive effect on price variability, whilst the square of distance has a significantly negative effect, as is postulated by a concave distance relationship. Again border dummies are generally positive and significant. Overall, the pattern of the results mirrors that for estimation specification 1 that we discussed above. This is also true when we divide all variables by distance (to control for potential heteroscedasticities in the error term that are positively related to the distance between locations). The results from this modification are presented in columns four and five of table 6 (summary results grouped by continental pairs) and table G (detailed results on estimated individual borders) and confirm our findings mentioned above.

Like Engel and Rogers (1996), we also perform further robustness checks in which we employ alternative measures of relative price volatility based on the spread between the 10th and 90th percentiles (volatility measure 2) and the standard deviation of the two-month ahead forecast error of each relative price series (whereby forecasts are based on an AR(6) process, volatility measure 3). For the overall period, the results from these estimates are presented in columns six to nine of table 6 (summary results grouped by continental pairs) and tables H and I (detailed results on estimated individual borders). The results show that these modifications also do not affect the key features of our results. In both cases, we find that the coefficients on distance and the border dummies are highly significant and of the hypothesized sign. Additionally, the observed pattern of the estimated border coefficients across countries remains unchanged.

7 Evidence for the EMU and the Pacific Sample

Thus far, our estimation analysis was based on the 'U.S. sample', i.e., we examined the dynamics of border effects across emerging market economies throughout the 1990s relative to the U.S.A. and Canada (and Japan) as representatives of industrialized countries. In a certain sense, this is the 'natural' choice as many emerging market countries have pegged (and have re-pegged) their currency to the dollar in one form or the other. In this section, we will consider two alternative samples of data: In the first sample (EMU sample), we will replace the U.S.A. and Canada by major European industrialized countries (Germany, Italy, Spain and Portugal), while in the second sample (Pacific sample), we will use data from Australia and New Zealand to replace the U.S. and Canadian data. Our particular interest in this section is, whether the patterns of border estimates between these industrialized countries and emerging market economies will mirror that found in the last section. Additionally, we will examine whether we are able to identify regional patterns of border estimates in the data, as Frankel and Wei (1994) or Engel and Rogers (1998) do.

EMU Sample

Results for the EMU sample are presented in tables 7, 8 and J. In table 7, we examine the role of distance, national borders, nominal exchange rate volatility, free trade and exchange rate arrangements for observed relative price dispersion between EMU countries and emerging market economies. All basic results from section 5.1 are confirmed: Distance and border have strongly positive impacts on observed relative price dispersion even after accounting for nominal exchange rate volatility. Border effects for countries with permanent floats are, on average, higher than for countries with permanent or temporary pegs, despite the danger of currency crises. Additionally, we can identify a strongly significant positive effect of EU (EMU) on integration.

The results from examining potential disintegration effects of currency crises are contained in tables 8 and J. As for the U.S./Canadian case, we find strong and relatively persistent disintegration effects of the currency crises on economic linkages between crises countries and EMU countries. Due to missing pegs between European countries and emerging market economies before the crisis, however, disintegration effects are relatively smaller. Another interesting observation is that the degree of heterogeneity of border effects between emerging market countries and EMU countries is much smaller than observed between emerging market countries and North American countries. This observation might also result from the non-existence of currency pegs between emerging market countries and EMU countries.

Pacific Sample

One of our goals when including data for Australia and New Zealand in the sample was to identify a potential 'Pacific' bloc. However, as the estimation results from tables 9, 10 and K show this is not the case. Table 9 indicates only a relatively weak 'Pacific' effect. The results for the estimated border effects from the total period and the subperiod are very close to that for the EMU. The results also show that there is a large degree of heterogeneity across Australia, New Zealand and Japan. In any case, none of the results (including those from the above sections) identify any form of yen or 'Pacific' bloc.

8 Summary and Policy Conclusions

The key message of this paper is that the major currency crises of the 1990s have had a sizeable disintegration effect by considerably distorting PPP between the major industrialized and emerging market economies. These effects have been quite persistent and nowadays relative price volatility between and within emerging markets economies is still considerably larger than a decade ago. This adverse effect on economic integration arising from a significant increase in cross-border relative price volatility is not just due to nominal exchange rate volatility. In trying to explain the relative sizes of the border effects we show that whilst controlling for nominal exchange rate variability somewhat weakens the effect of the border, the latter remains highly significant in all regressions. Our attempts to also control for geographic factors, the characteristics of the exchange rate regime or membership in free trade arrangements in all cases influences the estimated integration measures (the width of the border) somewhat, but their significance is unaltered by these sensitivity checks. For example, the trade bloc variable decreases the importance of the border effect whilst leaving the impact of nominal exchange rate volatility unaltered.

What are the policy implications of these findings? The literature on pricing to market has emphasized that price discrimination can occur when markets are segmented. The finding that distance is important in explaining global price differences between locations in the Americas, Europe, Asia and the Pacific lends support to this literature. The major currency crises are found to have greatly increased the importance of intra-continental and inter-continental borders, and to even have had adverse effects on within-country relative price volatility. Our width-of-the-border metric suggests that currency crises have produced a 'continental drift' phenomenon and thereby added to economic distance between global markets. Our estimates confirm that global product markets are still segmented, and that segmentation has increased under the crises of the 1990s. A policy aimed at securing a stable global financial architecture and preventing currency crises is a key ingredient in fostering trade and establishing globally integrated product markets.

9 Tables

Table 1: U.S. Sample, Descriptive Statistics, Continental Groups, Total Period and Subperiods, Volatility Measure 1

Continent Pair	Mean	Std.Dvt.	Mean	Std.Dvt.	Mean	Std.Dvt.	Mean	Std.Dvt.	Mean	Std.Dvt.
	1991.01-2001.06		1991.01-1994.11		1994.12-1997.06		1997.07-1998.12		1999.01-2001.06	
Intra-national	10.93	5.89	10.60	6.28	9.76	4.88	12.11	10.39	9.23	7.11
Within North-America	50.65	19.07	20.40	2.46	69.47	31.02	38.24	12.38	26.45	5.36
North vs. South America	58.43	23.37	37.72	11.90	51.93	34.12	37.74	18.82	50.87	15.83
North America vs. Asia	80.61	40.24	31.82	17.57	46.99	32.60	162.28	128.40	43.17	25.72
North America vs. Pacific	64.71	15.28	39.31	3.54	81.96	23.04	79.61	11.51	49.78	4.23
Within South America	50.36	16.06	46.63	11.10	27.75	8.56	38.33	20.10	69.05	13.46
South America vs. Asia	83.90	38.44	43.82	16.04	26.78	9.06	163.13	127.78	63.74	23.27
South America vs. Pacific	65.78	11.45	47.63	7.63	59.97	6.51	85.81	16.93	71.87	13.10
Within Asia	90.65	42.36	38.89	19.52	26.54	8.64	202.56	112.02	53.83	30.40
Asia vs. Pacific	79.54	32.33	45.12	15.18	58.51	9.15	152.18	110.69	60.75	25.98

Notes:

1) Table 1 reports descriptive statistics for the volatility of relative prices across regions that are included in our U.S. sample. The volatility of the real exchange rate between region i and region j, denoted as $V(q_{ij})$, is computed as the standard deviation of two-month changes in the relative price between the two regions, i.e.,

$$V(q_{ij}) = \sqrt{var(\Delta q_{ij,t})},$$

where $\Delta q_{ij,t}$ denotes the two-month change in regions' i and j relative price and $var(.)$ denotes the empirical variance of $\Delta q_{ij,t}$. There are 149 regions included in the U.S. sample out of which 11,026 relative price series are constructed. These 11,026 series belong to one of ten 'continental groups' as indicated in the first column.

2) All numbers are multiplied by 1,000.

Table 2: U.S. Sample, The Role of Distance, the Border, Exchange Rate and Trade Arrangements, Overall Period, Volatility Measure 1

Specification	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Variable	Coeff. (t-stat)	Coeff. (t-stat)	Coeff. (t-stat)	Coeff. (t-stat)	Coeff. (t-stat)	Coeff. (t-stat)	Coeff. (t-stat)	Coeff. (t-stat)	Coeff. (t-stat)	Coeff. (t-stat)
(ln)distance	3.34 (14.8)	2.63 (12.93)	0.64 (3.03)	2.63 (12.02)	2.16 (9.63)	2.47 (11.27)	1.37 (6.3)	2.18 (8.85)	2.37 (10.83)	1.17 (5.36)
Border	65.57 (34.45)	29.06 (17.16)	34.74 (19.95)	29.02 (16.75)	30.66 (17.4)	29.69 (16.95)	34.77 (18.83)	30.85 (17.69)	30.35 (17.15)	32.07 (18.66)
Nom.Exrate Volatility	-	0.354 (13.85)	0.353 (13.93)	0.354 (13.85)	0.352 (13.69)	0.352 (13.77)	0.338 (13.07)	0.352 (13.66)	0.349 (13.68)	0.317 (12.35)
Landlocked	-	-	-12.70 (-20.27)	-	-	-	-	-	-	-
NAFTA	-	-	-	0.14 (0.27)	-0.37 (-0.72)	-0.03 (-0.05)	-0.95 (-1.82)	-0.14 (-0.28)	-0.02 (-0.03)	-1.78 (-3.36)
ASEAN	-	-	-	-	-6.71 (-7.54)	-	-	-	-	-16.16 (-17.56)
ASEAN (- Indonesia)	-	-	-	-	-	-10.95 (-17.94)	-	-	-	-
ASEAN (+ Korea)	-	-	-	-	-	-	-14.65 (-15.77)	-	-	-
ASEAN (+ India)	-	-	-	-	-	-	-	-3.13 (-4.14)	-	-
ASEAN (- Indonesia, + Korea, + India)	-	-	-	-	-	-	-	-	-10.30 (-19.38)	-
Float	-	-	-	-	-	-	-	-	-	8.24 (19.16)
R^2_{adj}	0.807	0.864	0.869	0.864	0.865	0.865	0.869	0.865	0.866	0.872
$s.e.r.$	0.017	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014

Notes:

1) Table 2 reports results from estimating equation (1) in section 4 of the main text. The dependent variable is volatility measure 1. All regressions contain as explanatory variables a dummy for each of the included regions in addition to the variables listed in the table. A more detailed description of the variables included in the regression is given in the main text. All coefficients apart from those on nominal exchange rate volatility are multiplied by 1,000.

2) In brackets, t-statistics are reported. In computing these statistics, White's heteroscedastic-consistent standard errors were used. R^2_{adj} denotes the adjusted coefficient of determination and the term $s.e.r.$ denotes the standard error of regression.

3) For some countries data are not available for the overall period (see table A of section B for details). All regressions are based on 11,026 observations.

Table 3: U.S. Sample, The Role of Distance, the Border, Exchange Rate and Trade Arrangements, Overall Period, Volatility Measure 2

Specification	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Variable	Coeff. (t-stat)	Coeff. (t-stat)	Coeff. (t-stat)	Coeff. (t-stat)	Coeff. (t-stat)	Coeff. (t-stat)	Coeff. (t-stat)	Coeff. (t-stat)	Coeff. (t-stat)	Coeff. (t-stat)
(ln)distance	3.91 (11.07)	3.20 (9.43)	-2.05 (-5.25)	2.65 (7.34)	-0.06 (-0.15)	2.53 (6.9)	-0.37 (-0.97)	2.31 (5.36)	2.64 (7.2)	-0.49 (-1.28)
Border	102.21 (43.84)	65.79 (28.94)	80.80 (34.78)	67.79 (29.28)	77.23 (31.91)	68.31 (29.09)	81.54 (32.45)	69.18 (27.69)	67.84 (28.54)	79.94 (31.65)
Nom.Exrate Volatility	-	0.353 (13.6)	0.351 (13.79)	0.350 (13.52)	0.335 (12.85)	0.348 (13.44)	0.310 (12.03)	0.348 (13.37)	0.350 (13.41)	0.298 (11.6)
Landlocked	-	-	-33.55 (-30.63)	-	-	-	-	-	-	-
NAFTA	-	-	-	-8.19 (-9.68)	-11.14 (-13.2)	-8.32 (-9.8)	-10.79 (-12.72)	-8.41 (-10)	-8.19 (-9.66)	-11.28 (-13.3)
ASEAN	-	-	-	-	-38.72 (-22.33)	-	-	-	-	-35.95 (-23.52)
ASEAN (- Indonesia)	-	-	-	-	-	-8.36 (-6.21)	-	-	-	-
ASEAN (+ Korea)	-	-	-	-	-	-	-35.05 (-23.09)	-	-	-
ASEAN (+ India)	-	-	-	-	-	-	-	-2.38 (-1.67)	-	-
ASEAN (- Indonesia, + Korea, + India)	-	-	-	-	-	-	-	-	-0.35 (-0.33)	-
Float	-	-	-	-	-	-	-	-	-	4.88 (5.21)
R^2_{adj}	0.728	0.757	0.772	0.757	0.768	0.758	0.771	0.757	0.757	0.772
s.e.r.	0.029	0.027	0.026	0.027	0.026	0.027	0.026	0.027	0.027	0.026

Notes:

1) Table 3 reports results from estimating equation (1) in section 4 of the main text. The dependent variable is volatility measure 2. For further notes, see the footnotes of table 2.

Table 4: U.S. Sample, The Role of Distance, the Border, Exchange Rate and Trade Arrangements, Overall Period, Volatility Measure 3

Specification	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Variable	Coeff. (t-stat)	Coeff. (t-stat)	Coeff. (t-stat)	Coeff. (t-stat)	Coeff. (t-stat)	Coeff. (t-stat)	Coeff. (t-stat)	Coeff. (t-stat)	Coeff. (t-stat)	Coeff. (t-stat)
(ln)distance	1.66	1.23	-0.08	1.12	0.75	0.98	0.57	0.98	0.97	0.40
	(11.62)	(9.46)	(-0.57)	(8.19)	(5.41)	(7.2)	(4.3)	(6.49)	(7.12)	(3.02)
Border	41.13	18.96	22.70	19.38	20.67	19.95	21.85	19.93	20.12	19.59
	(33.82)	(16.63)	(19.39)	(16.69)	(17.57)	(17.03)	(17.68)	(17.17)	(16.99)	(17.01)
Nom.Exrate Volatility	-	0.215	0.214	0.214	0.212	0.212	0.207	0.214	0.211	0.190
		(12.65)	(12.71)	(12.61)	(12.44)	(12.52)	(12.02)	(12.51)	(12.46)	(11.16)
Landlocked	-	-	-8.35	-	-	-	-	-	-	-
			(-20.51)							
NAFTA	-	-	-	-1.70	-2.11	-1.85	-2.17	-1.79	-1.79	-2.86
				(-3.5)	(-4.33)	(-3.78)	(-4.45)	(-3.71)	(-3.67)	(-5.71)
ASEAN	-	-	-	-	-5.30	-	-	-	-	-7.56
					(-9.36)					(-12.91)
ASEAN (- Indonesia)	-	-	-	-	-	-9.35	-	-	-	-
						(-23.45)				
ASEAN (+ Korea)	-	-	-	-	-	-	-6.30	-	-	-
							(-10.72)			
ASEAN (+ India)	-	-	-	-	-	-	-	-0.95	-	-
								(-2)		
ASEAN (- Indonesia, + Korea, + India)	-	-	-	-	-	-	-	-	-5.79	-
									(-15.55)	
Float	-	-	-	-	-	-	-	-	-	6.89
										(21.57)
R^2_{adj}	0.795	0.847	0.851	0.847	0.848	0.848	0.849	0.847	0.848	0.854
$s.e.r.$	0.011	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010

Notes:

1) Table 4 reports results from estimating equation (1) in section 4 of the main text. The dependent variable is volatility measure 3. For further notes, see the footnotes of table 2.

Table 5: U.S. Sample, Regression Results for Individual Border Estimates, Overall Period and Subperiods, Volatility Measure 1, Summary Results

	Coeff.	Std.dvt.	Coeff.	Std.dvt.	Coeff.	Std.dvt.	Coeff.	Std.dvt.	Coeff.	Std.dvt.
	1991.01-2001.06		**1991.01-1994.11**		**1994.12-1997.06**		**1997.07-1998.12**		**1999.01-2001.06**	
(ln)dist	1.15	12.16	0.48	4.78	0.58	5.52	1.15	5.94	0.74	4.53
					North America - North America					
mean	39.70	24.32	14.18	3.17	56.52	40.60	29.50	15.66	18.24	5.66
min	11.61 (us-ca)		11.28 (us-ca)		9.69 (us-ca)		11.46 (us-ca)		11.71 (us-ca)	
max	53.86 (us-me)		17.57 (ca-me)		82.01 (us-me)		39.48 (us-me)		21.86 (us-me)	
					South America - South America					
mean	32.99	17.70	27.11	12.77	14.92	8.30	22.83	20.77	52.99	18.69
min	6.47 (ar-bo)		7.13 (ar-bo)		5.49 (ar-bo)		1.89 (ar-br)		32.52 (bo-co)	
max	56.53 (br-co)		36.5 (br-co)		24.26 (br-co)		42.56 (bo-co)		69.12 (br-co)	
					Asia - Asia					
mean	65.30	38.84	20.36	16.28	13.11	6.32	150.45	99.30	34.43	25.39
min	15.56 (indi-ta)		4.3 (indo-ko)		4.06 (indo-th)		24.02 (indi-ta)		4.11 (indi-ma)	
max	163.99 (indo-ta)		46.64 (indi-ko)		24.44 (indi-ko)		334.14 (indi-indo)		78.05 (indi-indo)	
					Asia - Pacific					
mean	62.91	28.38	32.13	13.84	48.93	8.99	123.52	97.73	48.46	21.51
min	33.77 (ja-ta)		20.38 (ja-ma)		33.05 (ja-ta)		39.13 (ja-ta)		29.74 (indi-ja)	
max	122.39 (ja-ko)		56.23 (ja-ta)		63.39 (ja-ph)		319.05 (indo-ja)		92.72 (indo-ja)	
					North America - South America					
mean	39.62	25.32	22.81	11.56	34.62	33.67	23.71	19.45	35.42	21.21
min	4.19 (us-bo)		4.36 (us-bo)		0.29 (us-ar)		-2.78 (us-ar)		2.82 (us-bo)	
max	78.67 (me-br)		43.06 (me-co)		80.78 (me-co)		47.95 (us-co)		60.66 (me-br)	

... to be continued

Table 5: ... continued

	Coeff.	Std.dvt.	Coeff.	Std.dvt.	Coeff.	Std.dvt.	Coeff.	Std.dvt.	Coeff.	Std.dvt.
	1991.01-2001.06		**1991.01-1994.11**		**1994.12-1997.06**		**1997.07-1998.12**		**1999.01-2001.06**	
					North America - Asia					
mean	59.50	34.90	19.01	14.52	29.51	30.47	131.56	106.06	26.90	20.95
min	18.73 (us-ta)		2.40 (us-indo)		1.47 (us-indo)		13.08 (us-indi)		-0.54 (us-ma)	
max	141.15 (me-indo)		50.41 (ca-indi)		81.25 (me-ko)		367.42 (me-indo)		74.4 (me-indo)	
					North America - Pacific					
mean	53.03	17.43	32.10	4.89	70.44	25.46	69.80	12.03	41.45	4.76
min	42.46 (us-ja)		27.05 (us-ja)		54.02 (ca-ja)		60.18 (ca-ja)		38.01 (us-ja)	
max	73.15 (me-ja)		36.81 (me-ja)		99.77 (me-ja)		83.29 (me-ja)		46.89 (me-ja)	
					South America - Asia					
mean	60.66	33.06	25.81	15.13	12.89	7.44	130.74	105.23	42.09	24.69
min	19.05 (bo-ta)		3.9 (bo-indo)		0.64 (ar-indo)		12.61 (ar-indi)		0.29 (bo-ma)	
max	134.57 (ar-indo)		58.42 (co-ma)		25.81 (bo-indi)		362.46 (co-indo)		84.28 (br-indo)	
					South America - Pacific					
mean	51.04	12.79	35.00	5.56	51.04	6.57	71.75	17.16	55.87	23.15
min	40.21 (bo-ja)		28.81 (bo-ja)		42.83 (co-ja)		62.08 (bo-ja)		29.6 (bo-ja)	
max	68.28 (br-ja)		42.22 (br-ja)		58.67 (br-ja)		97.4 (co-ja)		73.32 (br-ja)	

Notes:

1) Table 5 reports results from estimating equation (1) in section 4 of the main text. The dependent variable is volatility measure 1. For each country pair one border dummy variable is included in the regression equation. The total number of estimated border dummies is 105. The detailed estimation results for these dummies are reported in table E of section B. Table 5 reports summary results grouped by continents. For further notes, see the footnotes of table 2.

Table 6: U.S. Sample, Regression Results for Individual Border Estimates, Overall Period, Sensitivity Analysis, Summary Results

Country Pair	Coeff.	Std.dvt.	Coeff.	Std.dvt.	Coeff.	Std.dvt.	Coeff.	Std.dvt.
	Meas. 1, Spec. 2		**Meas. 1, Spec. 3**		**Meas. 2, Spec. 1**		**Meas. 3, Spec. 1**	
ln(dist.)/const.			1.12	15.12	0.78	2.56	1.16	10.42
distance	0.71	6.34						
$dist^2$	-0.04	-4.15						
North America - North America								
mean	40.06	24.49	39.69	24.32	60.81	26.26	28.08	16.99
min	11.77 (us-ca)		11.6 (us-ca)		30.72 (us-ca)		9.00 (us-ca)	
max	54.31 (us-me)		53.76 (us-me)		79.06 (ca-me)		41.58 (us-me)	
South America - South America								
mean	34.11	17.70	27.72	22.37	59.20	25.11	19.31	10.88
min	7.7 (ar-bo)		0.0 (br-co)		23.29 (ar-bo)		1.06 (ar-bo)	
max	57.41 (br-co)		56.78 (bo-co)		94.2 (br-co)		33.48 (br-co)	
Asia - Asia								
mean	66.40	38.72	65.35	38.86	102.03	57.59	40.66	24.61
min	17.09 (indi-ta)		15.66 (indi-ta)		41.16 (indi-ta)		9.34 (indi-ta)	
max	165.42 (indo-ta)		98.98 (indo-ko)		304.73 (indo-ta)		103.09 (indo-ta)	
Asia - Pacific								
mean	63.93	28.18	62.92	28.39	122.05	35.54	36.66	18.23
min	35.46 (ja-ta)		33.74 (ja-ta)		82.52 (ja-ta)		24.04 (ja-ta)	
max	123.07 (ja-ko)		69.43 (indo-ja)		188.75 (indo-ja)		77 (indo-ja)	
North America - South America								
mean	40.23	25.27	39.70	25.43	69.13	33.42	24.11	16.00
min	5.3 (us-bo)		4.03 (us-bo)		17.99 (us-ar)		1.76 (us-ar)	
max	78.91 (me-br)		78.92 (me-br)		123.14 (me-br)		43.54 (me-br)	

... to be continued

Table 6: ... continued

Country Pair	Coeff.	Std.dvt.	Coeff.	Std.dvt.	Coeff.	Std.dvt.	Coeff.	Std.dvt.
	Meas. 1, Spec. 2		Meas. 1, Spec. 3		Meas. 2, Spec. 1		Meas. 3, Spec. 1	
North America - Asia								
mean	59.80	34.76	59.57	34.92	87.80	46.04	38.99	24.23
min	19.63 (us-ta)		18.75 (us-ta)		37.04 (us-indi)		12.23 (ca-ta)	
max	141.17 (me-indo)		85.63 (me-ma)		224.05 (me-indo)		102.43 (us-indo)	
North America - Pacific								
mean	53.37	17.46	53.09	17.50	120.48	29.28	32.93	9.84
min	42.77 (us-ja)		42.5 (us-ja)		103.53 (ca-ja)		23.24 (ca-ja)	
max	73.53 (me-ja)		73.28 (me-ja)		154.29 (me-ja)		42.9 (me-ja)	
South America - Asia								
mean	61.50	32.84	60.76	33.08	90.56	35.32	33.43	19.37
min	21.21 (bo-ta)		18.92 (bo-ta)		39.15 (bo-indi)		9.89 (bo-ta)	
max	134.67 (ar-indo)		78.88 (br-ko)		193.2 (br-indo)		78.38 (bo-indo)	
South America - Pacific								
mean	51.80	12.54	51.11	12.89	117.10	22.51	27.46	8.51
min	41.5 (bo-ja)		40.09 (bo-ja)		97.17 (ar-ja)		19.53 (ar-ja)	
max	68.73 (br-ja)		68.44 (br-ja)		149.19 (br-ja)		36.72 (br-ja)	

Notes:

1) Table 6 reports results from estimating equation (1) in section 4 of the main text. The dependent variable is reported in the second row. ‘Meas.1’ denotes volatility measure 1, ‘Meas. 2’ denotes volatility measure 2 and ‘Meas. 3’ denotes volatility measure 3. In ‘Spec. 2’ the log of distance is replaced by distance and distance squared. In ‘Spec. 3’, all variables are divided by log distance. For each country pair one border dummy variable is included in the regression equation. The total number of estimated border dummies is 105. The detailed estimation results for these dummies are reported in tables F to I of section B. Table 5 reports summary results grouped by continents. For further notes, see the footnotes of table 2.

Table 7: EMU Sample, The Role of Distance, the Border, Exchange Rate and Trade Arrangements, Overall Period, Volatility Measure 1

Specification	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Variable	Coeff. (t-stat)	Coeff. (t-stat)	Coeff. (t-stat)	Coeff. (t-stat)	Coeff. (t-stat)	Coeff. (t-stat)	Coeff. (t-stat)	Coeff. (t-stat)	Coeff. (t-stat)	Coeff. (t-stat)
(ln)distance	5.37	3.82	1.66	2.05	1.49	1.87	0.58	1.51	1.72	0.41
	(23.79)	(16.18)	(7.03)	(9.41)	(6.57)	(8.52)	(2.58)	(6.3)	(7.86)	(1.79)
Border	59.39	24.67	31.25	33.23	35.31	34.03	40.04	35.45	34.87	39.38
	(32.84)	(16.67)	(20.02)	(18.23)	(18.78)	(18.45)	(20.38)	(18.88)	(18.72)	(20.31)
Nom.Exrate Volatility	-	0.370	0.367	0.337	0.333	0.334	0.317	0.334	0.331	0.306
		(14.28)	(14.31)	(13.03)	(12.82)	(12.94)	(12.15)	(12.79)	(12.83)	(11.82)
Landlocked	-	-	-14.78	-	-	-	-	-	-	-
			(-23.08)							
EMU	-	-	-	-19.15	-20.20	-19.55	-22.07	-19.94	-19.81	-27.89
				(-18.1)	(-18.4)	(-18.3)	(-19.61)	(-18.27)	(-18.53)	(-21.48)
ASEAN	-	-	-	-	-7.62	-	-	-	-	-16.83
					-8.99					(-18.83)
ASEAN (- Indonesia)	-	-	-	-	-	-11.57	-	-	-	-
						(-19.16)				
ASEAN (+ Korea)	-	-	-	-	-	-	-15.51	-	-	-
							(-17.26)			
ASEAN (+ India)	-	-	-	-	-	-	-	-3.61	-	-
								(-5.45)		
ASEAN (- Indonesia, + Korea, + India)	-	-	-	-	-	-	-	-	-11.08	-
									-20.49	
Float	-	-	-	-	-	-	-	-	-	4.61
										(14)
R^2_{adj}	0.817	0.876	0.881	0.882	0.882	0.882	0.887	0.882	0.883	0.888
$s.e.r.$	0.016	0.013	0.013	0.013	0.013	0.013	0.012	0.013	0.013	0.012

Notes:

1) Table 7 reports results from estimating equation (1) in section 4 of the main text. The dependent variable is volatility measure 1. Estimations are based on the EMU sample.

2) For some countries data are not available for the overall period (see table A of section B of the appendix for details). All regressions are based on 13,861 observations.

3) For further notes, see the footnotes of table 2.

Table 8: EMU Sample, Regression Results for Individual Border Estimates, Overall Period and Subperiods, Volatility Measure 1, Summary Results

	Coeff.	Std.dvt.	Coeff.	Std.dvt.	Coeff.	Std.dvt.	Coeff.	Std.dvt.	Coeff.	Std.dvt.
	1991.01-2001.06		**1991.01-1994.11**		**1994.12-1997.06**		**1997.07-1998.12**		**1999.01-2001.06**	
(ln)dist	1.11	2.71	0.86	7.64	0.72	6.79	0.96	5.55	1.06	6.73
EMU - EMU										
mean	16.56	5.91	21.85	6.72	22.08	10.83	1.94	1.43	0.69	0.70
min	10.35 (sp-po)		14.11 (sp-po)		9.94 (sp-po)		0.83 (ge-it)		0.24 (it-sp)	
max	24.77 (ge-it)		29.01 (it-sp)		40.78 (ge-it)		4.77 (sp-po)		1.96 (sp-po)	
South America - South America										
mean	33.07	17.71	26.46	12.73	14.69	8.24	23.15	20.85	52.37	18.79
min	6.53 (ar-bo)		6.6 (ar-bo)		5.3 (ar-bo)		2.05 (ar-br)		31.75 (bo-co)	
max	56.62 (br-co)		35.81 (br-co)		24.01 (br-co)		43.01 (bo-co)		68.54 (br-co)	
Asia - Asia										
mean	65.38	38.83	19.77	16.23	12.87	6.30	150.78	99.27	33.89	25.48
min	15.69 (indi-ta)		3.41 (indo-ko)		3.93 (indo-th)		24.5 (indi-ta)		3.67 (indi-ma)	
max	164.09 (indo-ta)		45.67 (indi-ko)		24.13 (indi-ph)		334.4 (indi-indo)		77.61 (indi-indo)	
EMU - North America										
mean	73.61	0.22	50.96	6.40	92.36	7.69	64.20	1.67	47.62	0.96
min	73.41 (po-me)		43.84 (ge-me)		83.49 (it-me)		61.98 (po-me)		46.55 (po-me)	
max	73.87 (sp-me)		57.74 (it-me)		102.24 (ge-me)		65.76 (it-me)		48.65 (it-me)	

... to be continued

Table 8: ... continued										
	Coeff.	Std.dvt.	Coeff.	Std.dvt.	Coeff.	Std.dvt.	Coeff.	Std.dvt.	Coeff.	Std.dvt.
	1991.01-2001.06		**1991.01-1994.11**		**1994.12-1997.06**		**1997.07-1998.12**		**1999.01-2001.06**	
					EMU - South America					
mean	45.24	12.00	47.42	8.35	24.86	5.59	40.15	19.11	53.95	16.60
min	27.5 (ge-bo)		25.55 (ge-bo)		16.94 (it-br)		24.62 (po-ar)		32.13 (po-bo)	
max	63.87 (it-br)		60.32 (it-br)		35.98 (ge-br)		73.67 (sp-co)		72.2 (it-br)	
					EMU - Asia					
mean	60.64	28.81	38.88	15.63	26.79	7.41	126.03	98.05	43.75	19.39
min	32.74 (ge-ta)		4.99 (ge-ma)		17.68 (po-ta)		19.33 (po-indi)		23.34 (po-indi)	
max	127.53 (it-indo)		61.11 (sp-indi)		47.03 (po-ko)		335.77 (ge-indo)		36.25 (it-ta)	
					EMU - Pacific					
mean	47.31	5.54	42.99	7.92	48.44	10.49	54.73	2.01	52.80	0.99
min	40.36 (ge-ja)		31.88 (ge-ja)		40.19 (ge-ja)		51.75 (po-ja)		52 (po-ja)	
max	53.7 (it-ja)		49.23 (sp-ja)		63.59 (it-ja)		56.18 (sp-ja)		36.25 (it-ta)	
					North America - South America					
mean	66.22	8.83	26.73	13.75	79.05	1.55	39.16	3.87	38.04	20.99
min	58.71 (me-bo)		13.74 (me-bo)		76.88 (me-ar)		35.35 (me-br)		18.22 (me-bo)	
max	78.76 (me-br)		42.39 (me-co)		80.54 (me-co)		44.54 (me-co)		60.03 (me-br)	
					North America - Asia					
mean	78.13	33.51	22.16	12.83	66.25	24.51	144.43	110.04	33.03	18.55
min	31.73 (me-ta)		11.69 (me-indo)		11.39 (me-ta)		42.8 (me-indi)		19.08 (me-indi)	
max	141.27 (me-indo)		47.14 (me-indi)		80.8 (me-ko)		367.92 (me-indo)		73.54 (me-indo)	
										... to be continued

Table 8: ... continued

	Coeff.	Std.dvt.	Coeff.	Std.dvt.	Coeff.	Std.dvt.	Coeff.	Std.dvt.	Coeff.	Std.dvt.
	1991.01-2001.06		**1991.01-1994.11**		**1994.12-1997.06**		**1997.07-1998.12**		**1999.01-2001.06**	
North America - Pacific										
mean	73.28	0.0	35.75	0.0	99.39	0.0	83.82	0.0	46.00	0.0
min	73.28 (me-ja)		35.75 (me-ja)		99.39 (me-ja)		83.82 (me-ja)		46 (me-ja)	
max	73.28 (me-ja)		35.75 (me-ja)		99.39 (me-ja)		83.82 (me-ja)		46 (me-ja)	
Asia - Pacific										
mean	63.00	28.38	31.43	13.80	48.68	8.99	123.87	97.71	47.87	21.51
min	33.86 (ja-ta)		19.68 (ja-ma)		32.77 (ja-ta)		39.51 (ja-ta)		29.05 (indi-ja)	
max	122.48 (ja-ko)		55.4 (ja-ta)		63.13 (ja-ph)		319.4 (indo-ja)		92.13 (indo-ja)	
South America - Asia										
mean	60.83	33.05	24.51	15.21	12.41	7.44	131.40	105.21	41.02	24.68
min	19.29 (bo-ta)		2.52 (bo-indo)		0.27 (ar-indo)		13.16 (ar-indi)		0.91 (bo-ma)	
max	134.7 (ar-indo)		57.14 (co-ma)		25.3 (bo-indi)		363.07 (co-indo)		83.46 (br-indo)	
South America - Pacific										
mean	51.20	12.78	33.67	5.70	50.56	6.60	72.41	17.16	54.73	23.30
min	40.41 (bo-ja)		27.25 (bo-ja)		42.36 (co-ja)		62.85 (bo-ja)		28.3 (bo-ja)	
max	68.43 (br-ja)		41.02 (br-ja)		58.24 (br-ja)		98.05 (co-ja)		72.32 (br-ja)	

Notes:

1) Table 8 reports results from estimating equation (1) in section 4 of the main text. The dependent variable is volatility measure 1. Estimations are based on the EMU sample. For each country pair one border dummy variable is included in the regression equation. The total number of estimated border dummies is 136. The detailed estimation results for these dummies are reported in table J of section B. Table 5 reports summary results grouped by continents. For further notes, see the footnotes of table 2.

Table 9: Pacific Sample, The Role of Distance, Border, Exchange Rate and Trade Arrangements, Overall Period, Volatility Measure 1

Specification	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Variable	Coeff. (t-stat)	Coeff. (t-stat)	Coeff. (t-stat)	Coeff. (t-stat)	Coeff. (t-stat)	Coeff. (t-stat)	Coeff. (t-stat)	Coeff. (t-stat)	Coeff. (t-stat)	Coeff. (t-stat)
(ln)distance	2.88 (8.3)	2.81 (9.12)	0.20 (0.69)	2.78 (9.01)	2.40 (7.74)	2.57 (8.29)	1.38 (4.51)	2.56 (8.1)	2.46 (7.94)	1.01 (3.25)
Border	87.08 (35.38)	51.29 (22.86)	58.39 (25.89)	51.55 (22.7)	52.87 (23.36)	52.41 (22.95)	57.97 (25.12)	52.47 (23.68)	53.14 (23.14)	54.26 (25.43)
Nom.Exrate Volatility	-	0.248 (12.01)	0.250 (12.27)	0.247 (11.94)	0.246 (11.86)	0.245 (11.88)	0.234 (11.37)	0.246 (11.86)	0.242 (11.81)	0.217 (10.7)
Landlocked	-	-	-21.66 (-21.15)	-	-	-	-	-	-	-
Pacific	-	-	-	-2.56 (-4.18)	-2.44 (-3.93)	-2.49 (-4.06)	-1.75 (-2.74)	-2.38 (-3.71)	-2.29 (-3.73)	-9.99 (-11.17)
ASEAN	-	-	-	-	-6.07 (-5.71)	-	-	-	-	-20.90 (-20.11)
ASEAN (- Indonesia)	-	-	-	-	-	-15.57 (-21.18)	-	-	-	-
ASEAN (+ Korea)	-	-	-	-	-	-	-18.57 (-17.29)	-	-	-
ASEAN (+ India)	-	-	-	-	-	-	-	-1.71 (-1.93)	-	-
ASEAN (- Indonesia, + Korea, + India)	-	-	-	-	-	-	-	-	-14.20 (-21.55)	-
Float	-	-	-	-	-	-	-	-	-	11.90 (16.97)
R^2_{adj}	0.799	0.839	0.846	0.840	0.840	0.840	0.845	0.840	0.841	0.849
$s.e.r.$	0.021	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.018

Notes:

1) Table 9 reports results from estimating equation (1) in section 4 of the main text. The dependent variable is volatility measure 1. Estimations are based on the Pacific sample.

2) For some countries data are not available for the overall period (see table A of section B of the appendix for details). All regressions are based on 10,878 observations.

3) For further notes, see the footnotes of table 2.

Table 10: Pacific Sample, Regression Results for Individual Border Estimates, Overall Period and Subperiods, Volatility Measure 1, Summary Results

	Coeff.	Std.dvt.	Coeff.	Std.dvt.	Coeff.	Std.dvt.	Coeff.	Std.dvt.	Coeff.	Std.dvt.
	1991.01-2001.06		**1991.01-1994.11**		**1994.12-1997.06**		**1997.07-1998.12**		**1999.01-2001.06**	
(ln)dist	1.15	9.29	1.22	7.50	0.71	5.13	1.02	4.10	1.64	7.69
Pacific - Pacific										
mean	50.73	18.86	29.47	14.82	71.11	34.32	31.84	6.73	40.42	15.20
min	29.21 (au-ne)		20.23 (ne-ja)		37.21 (au-ne)		24.36 (au-ne)		22.98 (au-ne)	
max	64.39 (au-ja)		46.57 (au-ja)		105.83 (au-ja)		37.44 (ne-ja)		50.83 (ne-ja)	
South America - South America										
mean	42.72	21.64	33.21	16.07	19.08	13.59	27.89	24.23	60.23	16.32
min	9.86 (au-bo)		9.05 (au-bo)		5.48 (au-br)		3.35 (au-br)		41.89 (bo-br)	
max	71.77 (br-co)		44.66 (au-co)		33.36 (br-co)		51.71 (bo-co)		73.15 (br-co)	
Asia - Asia										
mean	80.93	47.75	24.96	20.92	16.15	8.06	185.64	131.19	39.06	29.58
min	18.56 (indi-ta)		4.14 (indo-ko)		4.54 (indo-th)		30.5 (indi-ta)		4.49 (indi-ma)	
max	198.9 (indo-ta)		59.33 (indi-indo)		30.93 (indi-ko)		425.11 (indi-indo)		91.37 (indi-indo)	
Pacific - Asia										
mean	67.82	35.61	26.25	21.56	36.77	21.48	135.65	117.86	48.95	31.07
min	30.99 (ne-indi)		-4.2 (au-ma)		12.21 (ne-ta)		25.58 (ne-indi)		15.09 (ne-ta)	
max	149.73 (ne-indo)		75.97 (au-indi)		83.39 (ja-ph)		394.64 (indo-ja)		132.27 (ne-indo)	
North America - South America										
mean	87.51	12.12	33.31	18.54	96.77	2.04	40.25	8.10	42.27	21.32
min	77.89 (me-bo)		16.75 (me-bo)		94.89 (me-br)		32.92 (me-br)		18.54 (me-bo)	
max	104.65 (me-br)		54.13 (me-co)		99.41 (me-bo)		51.82 (me-co)		59.78 (me-br)	

... to be continued

Table 10: ... continued

	Coeff.	Std.dvt.	Coeff.	Std.dvt.	Coeff.	Std.dvt.	Coeff.	Std.dvt.	Coeff.	Std.dvt.
	1991.01-2001.06		**1991.01-1994.11**		**1994.12-1997.06**		**1997.07-1998.12**		**1999.01-2001.06**	
North America - Asia										
mean	100.07	41.84	28.34	16.43	81.14	30.77	178.17	143.39	36.26	21.36
min	40.09 (me-ta)		14.29 (me-indo)		13.18 (me-ta)		47.98 (me-indi)		20.65 (me-ma)	
max	177.64 (me-indo)		60.18 (me-indi)		102.55 (me-ko)		470.53 (me-indo)		82.79 (me-indo)	
Pacific - North America										
mean	94.46	0.0	35.90	0.0	141.99	0.0	79.02	0.0	44.69	0.0
min	82.53 (au-me)		21.01 (ne-me)		126.07 (me-ja)		64.84 (au-me)		29.92 (au-me)	
max	105.27 (ne-me)		43.71 (me-ja)		154.59 (ne-me)		102.99 (me-ja)		56.58 (me-ja)	
South America - Asia										
mean	77.54	41.07	29.87	17.86	16.18	10.16	167.14	136.37	43.25	25.56
min	23.13 (bo-indi)		3.45 (bo-indo)		1.17 (ar-indo)		14.35 (ar-indi)		-2.18 (bo-ma)	
max	170.03 (ar-indo)		62.43 (ar-indi)		36.03 (co-ph)		471.88 (co-indo)		98.8 (co-indo)	
Pacific - South America										
mean	55.42	19.69	35.14	17.45	39.73	21.96	71.98	22.81	54.28	26.34
min	33.26 (ne-bo)		7.4 (ne-ar)		17.36 (ne-ar)		47.61 (ne-ar)		18.75 (ne-co)	
max	87.81 (ja-br)		71.3 (ne-co)		73.85 (ja-br)		127.22 (ja-co)		86.09 (ja-co)	

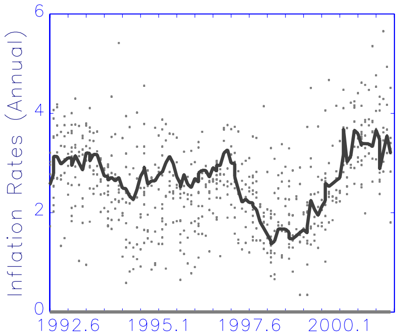
Notes:

1) Table 10 reports results from estimating equation (1) in section 4 of the main text. The dependent variable is volatility measure 1. Estimations are based on the Pacific sample. For each country pair one border dummy variable is included in the regression equation. The total number of estimated border dummies is 105. The detailed estimation results for these dummies are reported in table K of section B. Table 5 reports summary results grouped by continents. For further notes, see the footnotes of table 2.

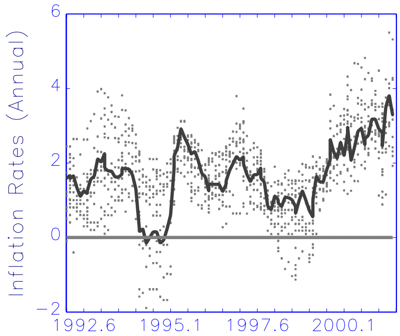
10 Figures

Figure 1: Selected National CPI Inflation Rates and Regional Inflation Diversity, North and South America, Overall Period (1991.01 - 2001.06)

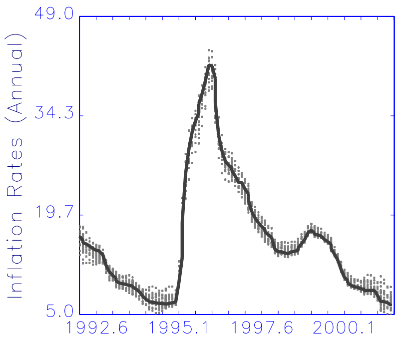
(a) United States



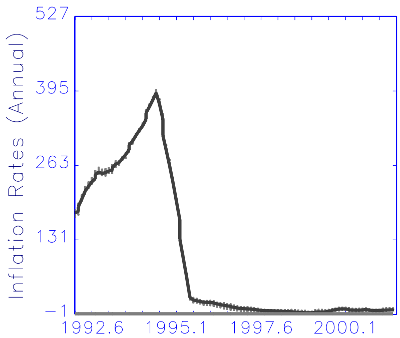
(b) Canada



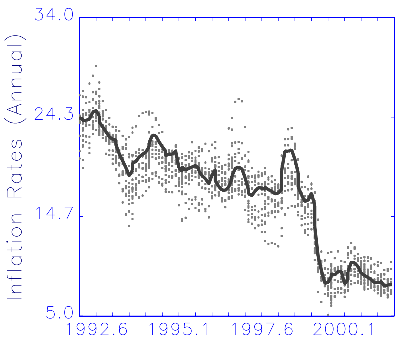
(c) Mexico



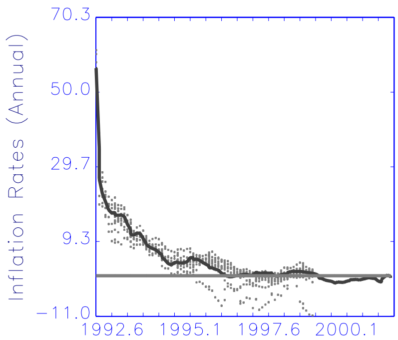
(d) Brazil



(e) Colombia



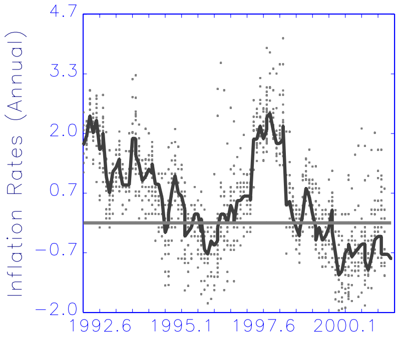
(f) Argentina



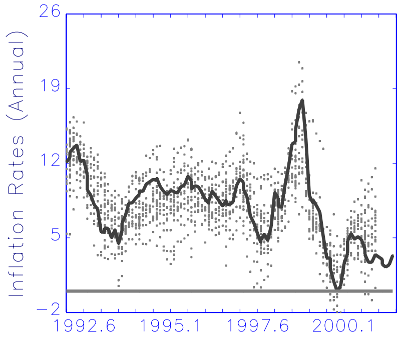
Notes: *Figure 1 plots regional inflation rates for North and South American regions. Inflation rates are computed as annual percentage changes in the underlying price index. The solid line represents the national average inflation rate.*

Figure 2: Selected National CPI Inflation Rates and Regional Inflation Diversity, 'Pacific' and Asian Countries, Overall Sample Period (1991.01 - 2001.06)

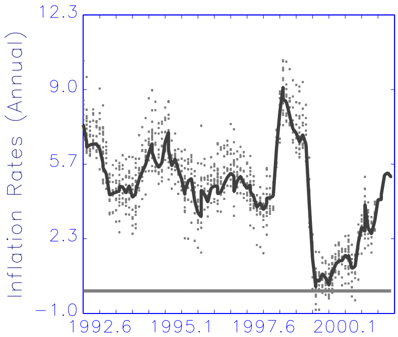
(a) Japan



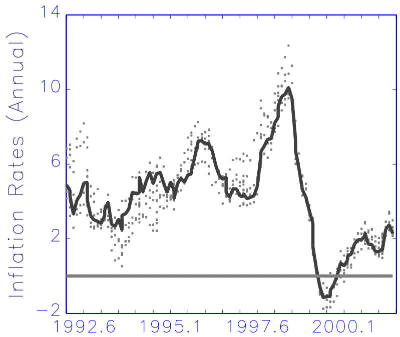
(b) India



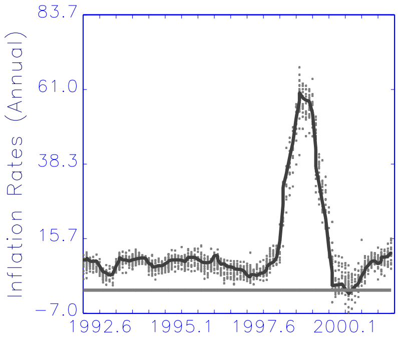
(c) Korea



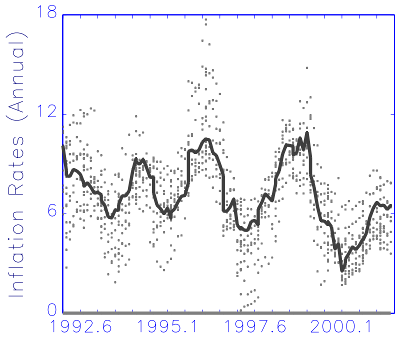
(d) Thailand



(e) Indonesia



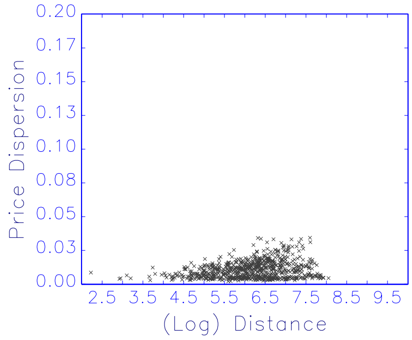
(f) Philippines



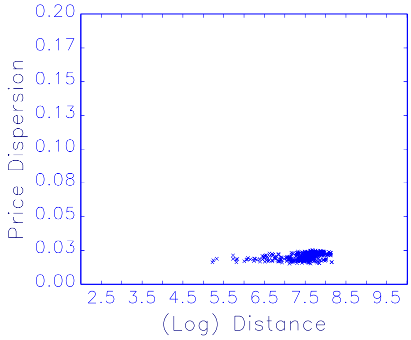
Notes: *Figure 2 plots regional inflation rates for Asian regions (inclusive Japan). Inflation rates are computed as annual percentage changes in the underlying price index. The solid line represents the national average inflation rate.*

Figure 3: Intra-National and Intra-Continental Relative Price Volatility, Pre-Mexican Crisis Period (1991.01 - 1994.11), Grouped by Continent Blocs

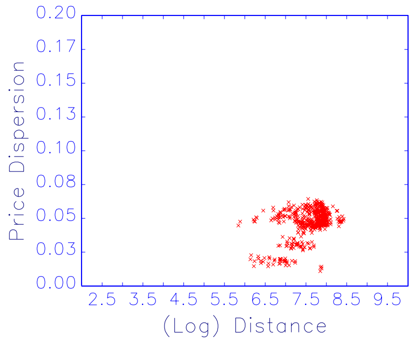
(a) Intra-National



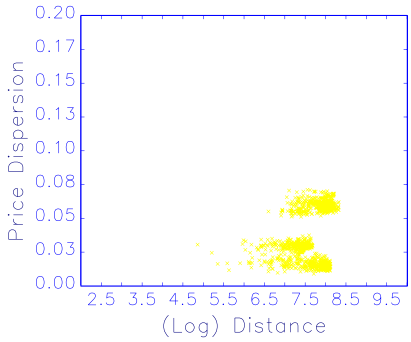
(b) North America, Intra-Continental



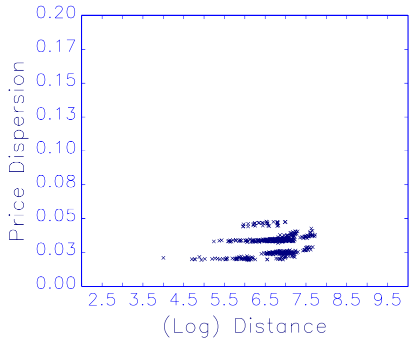
(c) South America, Intra-Continental



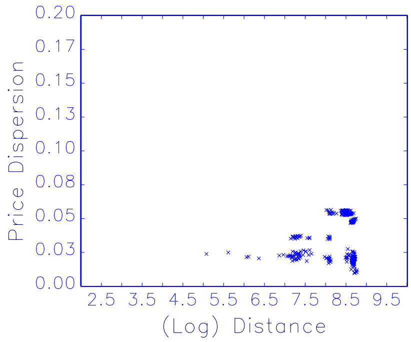
(d) Asia, Intra-Continental



(e) EMU, Intra-Continental



(f) Pacific, 'Intra-Continental'



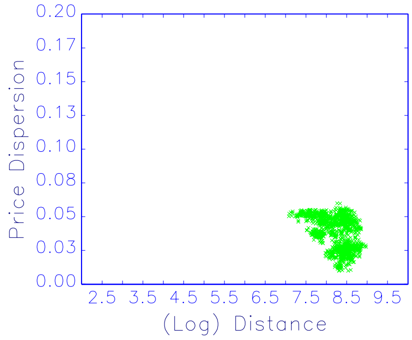
Notes: *1) Figure 3 plots our measure of relative price dispersion across two regions that are located in the same continent against the distance (in logs) between the two respective regions. Relative price dispersion between region i and region j, denoted as $V(q_{ij})$, is computed as the standard deviation of two-month changes in the relative price between the two regions, i.e.,*

$$V(q_{ij}) = \sqrt{var(\Delta q_{ij,t})},$$

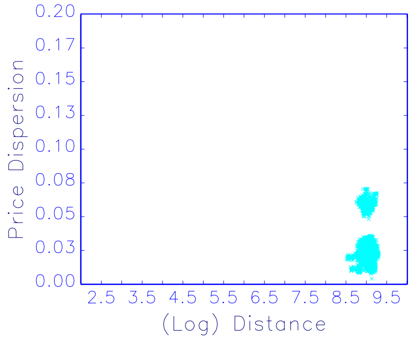
where $\Delta q_{ij,t}$ denotes the two-month change in region's i and region's j relative price and $var(.)$ denotes the empirical variance of $\Delta q_{ij,t}$. The sample period is 1991.01 - 1994.11.
2) A detailed description of which regional pairs are included in the respective plots can be derived from table A.

Figure 4: Inter-Continental Relative Price Volatility, Pre-Mexican Crisis Period (1991.01 - 1994.11), Grouped by Continent Blocs

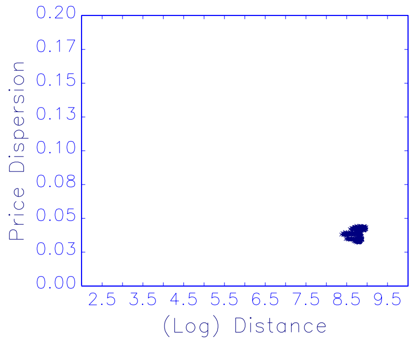
(a) North America vs. South America



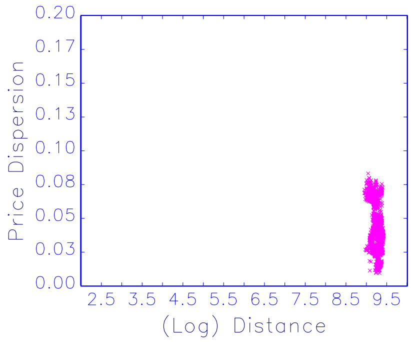
(b) North America vs. Asia



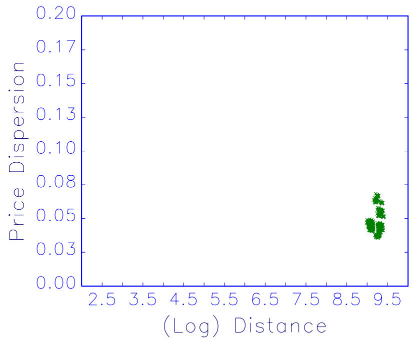
(c) North America vs. Pacific



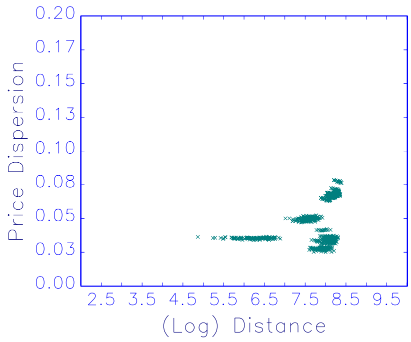
(d) South America vs. Asia



(c) South America vs. Pacific



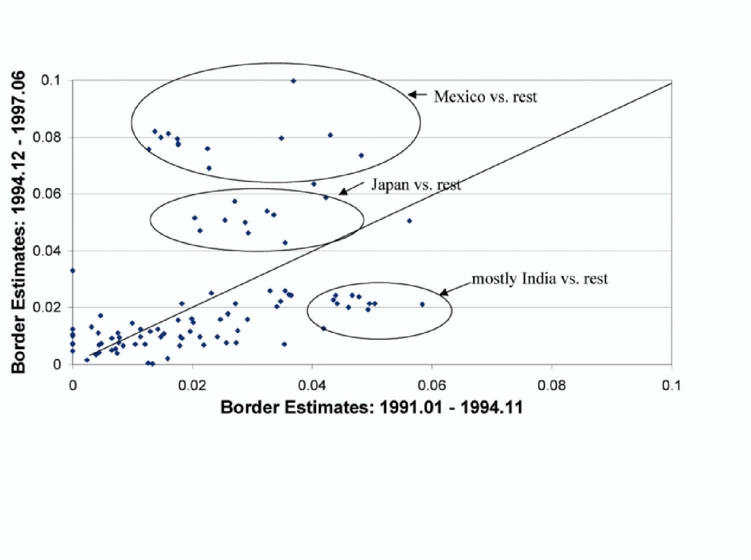
(d) Asia vs. Pacific



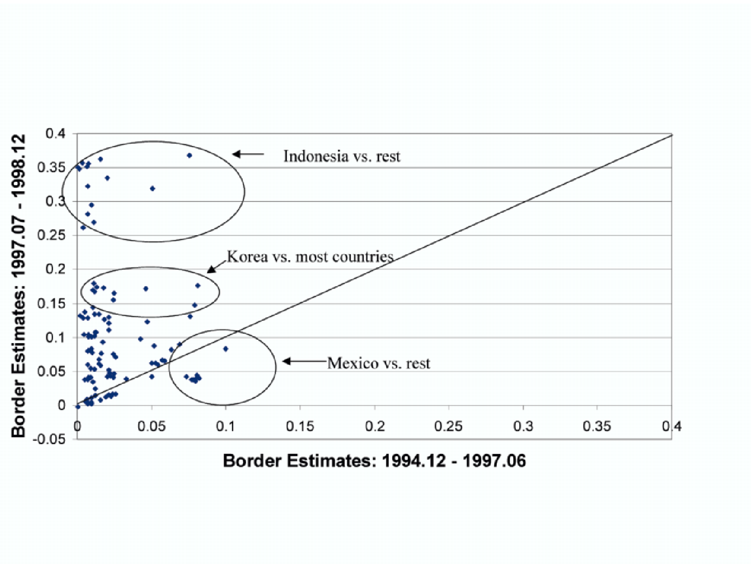
Notes: *Figure 4 plots our measure of relative price dispersion across two regions that are located in different continents against the distance (in logs) between the two respective regions. For further notes, see the footnotes of figure 3.*

Figure 5: Estimated Border Effects in Selected Subperiods

(a) Pre-Crisis Period (1991.01 - 1994.11) vs. Mexican-Crisis Period (1994.12 - 1997.06)

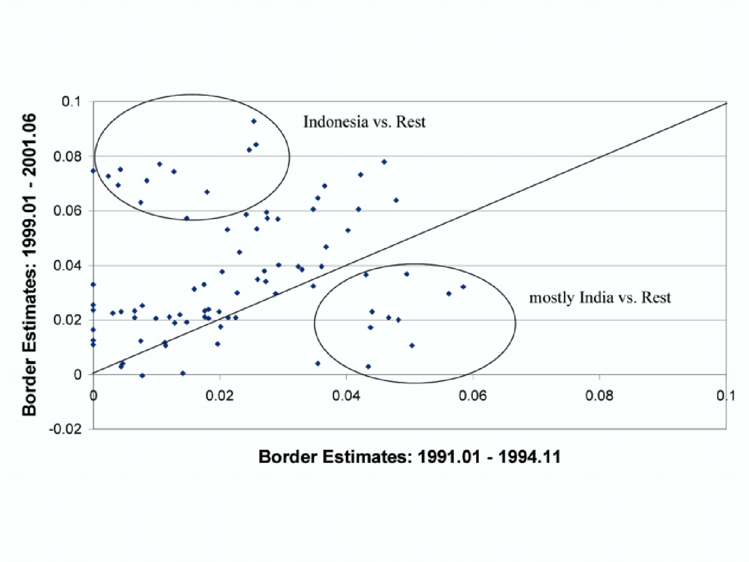


(b) Mexican-Crisis Period (1994.12 - 1997.06) vs. Asia-Crisis Period (1997.07 - 1998.12)



Notes: *1) The upper panel of figure 5 plots the estimated values of the border dummies for the post-Mexican crisis period (1994.12 - 1997.06) on the vertical axis and the corresponding values for the pre-Mexican crisis period (1991.01 - 1994.11) on the horizontal axis. Estimations are based on equation* (1) *in section 4 of the main text. The dependent variable is volatility measure 1. For each country pair one border dummy variable is included in the regression equation. The total number of estimated border dummies is 105.*
2) The upper panel of figure 5 plots the estimated values of the border dummies for the post-Asian crisis period (1997.07 - 1998.12) on the vertical axis and the corresponding values for the pre-Asian crisis period (1994.12 - 1997.06) on the horizontal axis. Estimations are based on equation (1) *in section 4 of the main text. The dependent variable is volatility measure 1. For each country pair one border dummy variable is included in the regression equation. The total number of estimated border dummies is 105.*

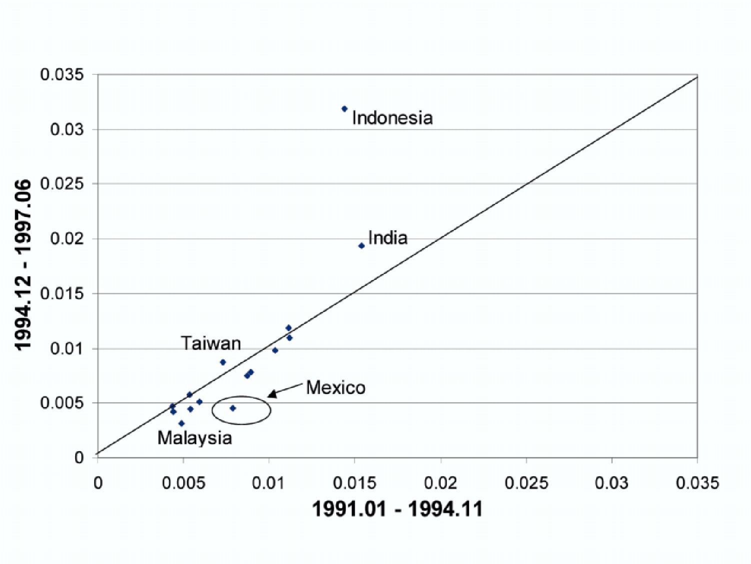
Figure 6: Estimated Border Effects: Pre-Mexican (1991.01 - 1994.11) versus Post-Asian (1999.01 - 2001.06) Crisis Period



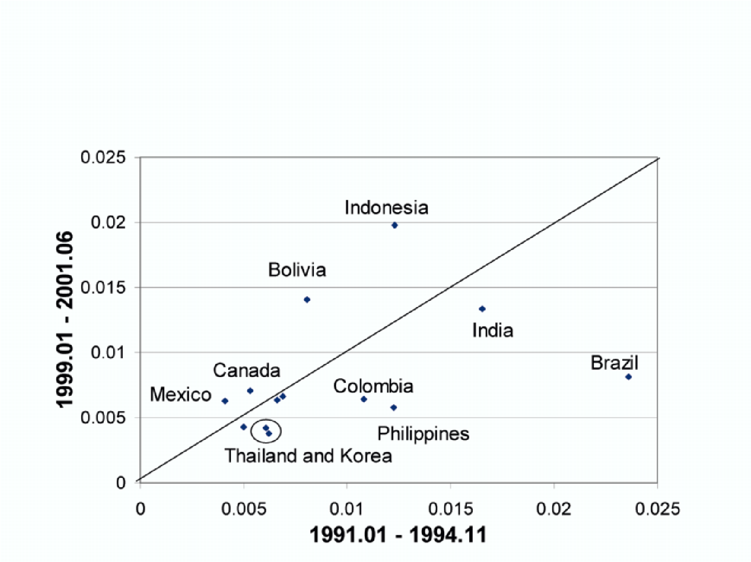
Notes: *1) Figure 6 plots the estimated values of the border dummies for the post-Asian crisis period (1999.01 - 2001.06) on the vertical axis and the corresponding values for the pre-Mexican crisis period (1991.01 - 1994.11) on the horizontal axis. Estimations are based on equation* (1) *in section 4 of the main text. The dependent variable is volatility measure 1. For each country pair one border dummy variable is included in the regression equation. The total number of estimated border dummies is 105.*

Figure 7: Within-Country Price Dispersion in Selected Subperiods

(a) Mexican-Crisis Period (1994.12 - 1997.06) vs. Asia-Crisis Period (1997.07 - 1998.12)



(b) Pre-Mexican (1991.01 - 1994.11) vs. Post-Asian (1999.01 - 2001.06) Crisis Period



Notes: *1) The upper panel of figure 7 plots mean values of relative price dispersion across country groups (e.g., the mean of relative price volatilities of all U.S. locations) for the Asian crisis period (1997.07 - 1998.12) on the vertical axis, and for the Mexican crisis period (1999.01 - 2001.06) on the horizontal axis. Only intra-national region pairs are considered. The solid line is the* 45° *line.*
2) The lower panel of figure 7 plots mean values of relative price dispersion across country groups for the pre-Mexican crisis period (1991.01 - 1994.11) on the vertical axis, and for the post-Asian crisis period (1999.01 - 2001.06) on the horizontal axis. Only intra-national region pairs are considered. The solid line is the 45° *line.*

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A Data

An overview of the countries and regions that are included in our study is given in table A. As one can see there we are using regional consumer price index (CPI) data for countries from North America, South America, Europe, Asia and Oceania (Australia and New Zealand). As table A shows, we construct a so-called 'Pacific' group of countries that consists of Australia, New Zealand and Japan. We decided not to add Japan to the Asian group (which it belongs to geographically) since the members of this group can all be classified to be emerging market economies whereas Japan clearly is an industrialized country. As table A indicates, all data were retrieved from official sources (either from the respective country's national statistical office, its central bank or from regional statistical offices). The number of regions for which we have data available differs across countries. For some countries, we have data for 20 or more locations available. To keep estimations manageable we constrain the maximum number of locations in these cases to 15 for big countries such as Mexico, India and Indonesia or to 10 for smaller countries such as Germany, Italy, Spain, Korea and the Philippines. The selection process is done based on two criteria: the degree of regional dispersion in the respective country and the size of a region. Our goal is to choose regions in such a way that they are evenly spread across the respective country whereby bigger locations (in terms of population) are preferred to smaller locations. As table A shows, our sample includes 34 North American regions, 37 European regions, 38 South American regions, 65 Asian regions and 30 'Pacific' regions. This gives us a total of 204 locations. Following the 'usual' approach of using all possible relative prices that can be computed out of a given sample of CPI data this would give us $204 * 203/2 = 20706$ relative price series at hand. For computational ease, we split the overall sample in three subsamples that we call 'U.S. sample', 'EMU sample' and 'Pacific sample'. These samples differ both with respect to the industrialized countries included and the base currency chosen.

U.S. Sample

The U.S. sample consists of the U.S.A., the Canadian and the Mexican regions in addition to all South American, Asian and Japanese regions. The total number of included locations is 149 which allows us to construct a total of $149 * 147/2 = 11,026$ relative prices. The frequency of most CPI series is monthly; for some U.S. locations (see table A for details) only bi-monthly data are available. The sample period is January 1991 to June 2001. However, as table A shows, for some countries (Argentina, Bolivia, India, Korea and Taiwan) data are not available for the full time period (although in most of these cases only few observations are missing). For the U.S. sample the dollar was chosen as the base currency.

EMU Sample
The EMU sample consists of the German, the Italian, Spanish and Italian regions in addition to all South American, Asian, Mexican and Japanese regions. The total number of included locations is 167 which allows us to construct a total of $167 * 166/2 = 13,861$ relative prices. The frequency of all CPI series is monthly. The sample period is January 1991 to June 2001. However, as table A shows, for some countries (Argentina, Bolivia, India, Korea and Taiwan) data are not available for the full time period (although in most of these cases only few observations are missing). For the EMU sample the deutschmark was chosen as the base currency.

Pacific Sample
The Pacific sample consists of the regions of Australia, New Zealand and Japan in addition to all South American, Asian and Mexican regions. The total number of included locations is 148 which allows us to construct a total of $148*147/2 = 10,878$ relative prices. The frequency of most CPI series is monthly; for locations in Australia and New Zealand (see table A for details) only quarterly data are available. The sample period is January 1991 to June 2001. However, as table A shows, for some countries (Australia, New Zealand, Argentina, Bolivia, India, Korea and Taiwan) data are not available for the full time period (although in most of these cases only few observations are missing). For the Pacific sample the yen was chosen as the base currency.

Consumer price data are closer to being monthly average data than point-in-time data. In order to compare prices internationally we use monthly average exchange rates from the IMF's International Financial Statistics. For each good, we calculated the inter-city relative prices. We also use data on the distance between cities. Our distance measure is the great-circle distance computed from the latitude and longitude data of each location included in our sample.

B Tables

Table A: Description of Sample: Included Countries and Regions

	North America			Europe			
Country	Canada	Mexico	U.S.A.	Germany	Italy	Spain	Portugal
Regions	Charlottetown (Pr. Edw. Isl.)	Acapulco	Boston	Berlin (Berlin)	Ancona	Badajoz (Extremadura)	Coimbra (Centro)
	Edmonton (Alberta)	Aguascalientes	Chicago	Dresden (Sachsen)	Bari	Barcelona (Cataluna)	Evora (Alentejo)
	Fredericton (New Brunswick)	Chihuahua	Cleveland	Düsseldorf (Nordr. Westf.)	Firenze	LaCoruna (Galicia)	Faro (Algarve)
	Halifax (Nova Scotia)	Colima	Detroit Detroit	Erfurt (Thüringen)	Milano	Madrid (Comm. Madrid)	Funchal (Madeira)
	Quebec (Quebec)	Culiacan	Houston Houston	Hannover (Niedersachsen)	Napoli	Murcia (Comm. Murcia)	Lisbon (LVT)
	Regina (Saskatchewan)	Guadalajara	Los Angeles	München (Bayern)	Palermo	Oviedo (Princ. de Asturias)	Ponta Delgada (Acores)
	St. John's (New Foundland)	Hermosillo	New York	Saarbrücken (Saarland)	Reggio Calabria	Pamplona (Navarra)	Porto (Norte)
	Toronto (Ontario)	Ciuadad Juarez	Philadelphia	Schwerin (Mecklen-Vorp.)	Roma	Saragossa (Aragon)	
	Victoria (Br. Columbia)	Merida	San Francisco	Stuttgart (B.-Württemb.)	Torino	Seville (Andalucia)	
	Winnipeg (Manitoba)	Mexicali		Wiesbaden (Hessen)	Venezia	Valencia (Comm. Valenicana)	
		Mexico					
		Monterrey					
		Puebla					
		San L. Potosi					
		Villahermosa					
Frequency:	monthly	monthly	(bi)monthly	monthly	monthly	monthly	monthly
Range:	1991.01-2001.06	1991.01-2001.06	1991.01-2001.06	1991.01-2001.06	1991.01-2001.06	1991.01-2001.06	1991.01-2001.06
Exceptions:			odd: bost, clev; even: hous, detr, phil, sanf				
Source:	Statistic Canada (CANSIM)	Banco de Mèxico	Bureau of Labor Statistics	Stat. Offices of German States	Istituto Nazionale di Stat. (ISTAT)	Instituto Nacional de Est. (INE)	Instituto Nacional de Est. (INE)

... to be continued

Table A: ... continued

Continent	South America				Oceania ('Pacific' Countries)		
Country	Argentina	Bolivia	Brazil	Columbia	Australia	NewZealand	Japan
Regions	Buenos Aires (Buenos Aires)	Cochabamba	Belm	Barranquila	Adelaide	Auckland	Akita
	Cordoba (Cordoba)	El Alto	Belo Horizonte	Bogota	Brisbane	Christchurch	Fukuoka
	Formosa (Formosa)	La Paz	Braslia	Bucaramanga	Canberra	Dunedin	Hiroshima
	Gran Mendoza (Mendoza)	Santa Cruz	Curitiba	Cali	Darwin	Hamilton	Kagoshima
	Posadas (Misiones)		Fortaleza	Cartagena	Hobart	Invercargill	Kanazawa
	Resistencia (Chaco)		Goinia	Cucuta	Melbourne	Napier-Hastings	Kobe
	Salta (Salta)		Porto Alegre	Manizales	Perth	New Plymouth	Kyoto
	San Salv. de J. (Jujuy)		Recife	Medellin	Sydney	Timaru	Nagoya
	Tucuman		Rio de Janeiro	Monteria		Wanganui	Niigata
	Ushuaia (T. del Fuego)		Salvador	Neiva		Wellington	Sapporo
			Sao Paulo	Pasto			Sendai
				Pereira			Tokyo
				Villavicencio			
Frequency:	monthly	monthly	monthly	monthly	quarterly	quarterly	monthly
Range:	1991.01-1998.12	1992.01-2001.06	1991.01-2001.06	1991.01-2001.06	1991.03-2001.06	1993.12-2000.09	1999.01-2001.04
Exceptions:		92.11 and 92.12 missing	91.08 missing			auck, chris and well start in 91.03	
Source:	Instituto Nacional de Est. y Censos (INDEC)	Instituto Nacional de Est. (INE)	Instituto Brasileiro de Geografia e Est. (IBGE)	Departamento Adm. Nacional de Est. (DANE)	Australian Bureau of Stat. (ABS)	Stat. New Zealand (SNZ)	Stat. Bureau a. Stat. Center, Min. of Publ. Management, Home Aff., Posts a. Telecomm.

... to be continued

Table A: ... continued

Continent	Asia						
Countries	India	Indonesia	Korea	Malaysia	Philippines	Taiwan	Thailand
Regions	Bangalore	Ambon	Busan	Kota Kinabalu (Sabah.)	Cagayan d. Oro (RegionX)	Chiayi	Bangkok (B. Metropolis)
	Bhopal	Banda Aceh	Daegu	Kuala Lumpur (Peninsula Mal.)	Cebu (Region VII)	Hsinchu	Chiang Mai (North Region)
	Chennai (Madras)	Bandung	Daejeon	Kuching (Sarawak)	Cotabato (Region XII)	Hwalien	Hat Yai (South Region)
	Delhi	Bengkulu	Gangneung		Davao (Region XI)	Kaohsiu	Khon Kaen (North-East R.)
	Hyderabad	Denpasar	Gwangju		Iloilo (Region VI)	Taichung	N. Ratchasima (Central-East R.)
	Jabalpur	Jakarta	Incheon		Legaspi (Region V)	Tainan	
	Jaipur	Kupang	Mokpo		Manila (Nat. Cap. R.)	Taipei	
	Kolkata	Manado	Seoul		Tacloban (Region VIII)		
	Lucknow	Medan	Suwon		Tuguegarao (Region II)		
	Madurai	Pakanbaru	Wonju		Zamboanga (Region IX)		
	Mumbai (Bombay)	Palembang					
	Nagpur	Pontianak					
	Patna	Samarinda					
	Surat	Surabaya					
	Vishakhapatnam	Ujung Pandang					
Frequency:	monthly	monthly	monthly	monthly	monthly	monthly	monthly
Range:	1991.01-2000.12	1991.01-2001.06	1991.01-2000.12	1994.01-2001.05	1991.01-2001.08	1996.01-2001.01	1991.01-2001.06
Source:	Government of India, Ministry of Stat. and Programme Impl.	Badan Pusat Statistik (Stat., Indonesia, BPS)	National Stat. Office (NSO)	Jabatan Perangkaan Malaysia (Department of Stat. Malaysia)	National Stat. Office (NSO)	Directorate-General of Budget, Accounting and Stat.	Department of Internal Trade, Ministry of Commerce

Table B: Country Short Names

Country	Short Name	Country	Short Name
Argentina	ar	Korea	ko
Australia	au	Malaysia	ma
Bolivia	bo	Mexico	me
Brazil	br	New Zealand	newz
Canada	ca	Philippines	ph
Columbia	co	Portugal	po
Germany	ge	Spain	sp
India	indi	Taiwan	ta
Indonesia	indo	Thailand	th
Italy	it	U.S.A.	us
Japan	ja		

Table C: U.S. Sample, Descriptive Statistics, Intra-Continental Relative Price Dispersion, Pre-Mexican Crisis Period (1991.01 - 1994.11), Volatility Measure 1

North Am. - North Am.			**South Am. - South Am.**			**Asia - Asia**			**Pacific - Pacific**		
Country Pair	Mean	Std.Dvt.	Country Pair	Mean	Std.Dvt.	Country Pair	Mean	Std.Dvt.	Country Pair	Mean	Std.Dvt.
us-us	6.88	1.53	ar-ar	12.00	3.55	indi-indi	16.53	4.08	ja-ja	5.01	1.30
us-ca	17.57	1.10	ar-bo	17.84	2.53	indi-indo	61.07	3.23			
us-me	19.62	1.63	ar-br	53.61	3.90	indi-ko	59.18	3.00			
ca-ca	5.31	0.98	ar-co	46.50	2.30	indi-ma	16.84	4.03			
ca-me	22.79	0.97	bo-bo	8.07	2.16	indi-ph	59.23	3.31			
me-me	4.08	0.69	bo-br	31.40	3.76	indi-ta	.	.			
			bo-co	45.31	2.70	indi-th	56.09	3.28			
			br-br	23.61	5.81	indo-indo	12.31	2.53			
			br-co	54.58	4.14	indo-ko	14.61	2.09			
			co-co	10.81	3.40	indo-ma	19.92	4.93			
						indo-ph	30.75	2.40			
						indo-ta	.	.			
						indo-th	17.17	2.41			
						ko-ko	6.09	1.33			
						ko-ma	17.34	1.97			
						ko-ph	28.48	1.72			
						ko-ta	.	.			
						ko-th	15.05	1.89			
						ma-ma	6.62	2.94			
						ma-ph	27.46	2.68			
						ma-ta	.	.			
						ma-th	13.34	2.09			
						ph-ph	12.27	2.10			
						ph-ta	.	.			
						ph-th	30.19	1.79			
						ta-ta	.	.			
						ta-th	.	.			
						th-th	6.20	1.22			

Notes:

1) Table C reports descriptive statistics for the volatility of relative price across regions that are located in the same continent. The volatility measure $V(q_{ij})$ is computed as described in the footnotes of table 1. A description of the used country short names is given in table B.

Table D: U.S. Sample, Descriptive Statistics, Inter-Continental Relative Price Dispersion, Pre-Mexican Crisis Period (1991.01 - 1994.11), Volatility Measure 1

North Am. - South Am.			**North Am. - Asia**			**South Am. - Asia**			**South Am. - Pacific**		
Country Pair	Mean	Std.Dvt.	Country Pair	Mean	Std.Dvt.	Country Pair	Mean	Std.Dvt.	Country Pair	Mean	Std.Dvt.
us-ar	23.84	3.43	us-indi	56.44	3.64	ar-indi	65.03	3.49	ar-ja	43.63	1.82
us-bo	13.20	1.81	us-indo	13.24	2.34	ar-indo	26.07	2.34	bo-ja	37.31	0.75
us-br	40.32	8.59	us-ko	11.16	1.70	ar-ko	26.13	1.60	br-ja	58.04	4.84
us-co	37.00	2.37	us-ma	15.78	4.10	ar-ma	15.53	3.50	co-ja	45.07	2.06
ca-ar	27.48	2.04	us-ph	29.19	2.38	ar-ph	35.58	2.55	**North Am. - Pacific**		
ca-bo	19.35	1.91	us-ta	.	.	ar-ta	.	.	us-ja	34.29	1.09
ca-br	44.51	3.43	us-th	12.31	2.38	ar-th	26.53	1.81	ca-ja	38.74	0.67
ca-co	45.03	2.15	ca-indi	62.44	2.80	bo-indi	49.63	3.06	me-ja	42.70	0.72
me-ar	26.63	1.74	ca-indo	18.34	2.14	bo-indo	15.84	2.60	**Asia - Pacific**		
me-bo	22.15	2.09	ca-ko	20.01	1.28	bo-ko	16.81	1.97	indi-ja	68.05	3.21
me-br	49.59	3.20	ca-ma	26.68	2.98	bo-ma	23.37	6.27	indo-ja	34.92	2.42
me-co	51.35	2.05	ca-ph	30.00	2.07	bo-ph	33.48	2.06	ja-ko	5.01	1.30
			ca-ta	.	.	bo-ta	.	.	ja-ma	35.39	0.52
			ca-th	19.04	1.17	bo-th	15.65	1.60	ja-ph	27.08	1.16
			me-indi	59.87	2.79	br-indi	69.14	4.07	ja-ta	49.79	1.34
			me-indo	22.19	1.95	br-indo	44.90	4.26	ja-th	.	.
			me-ko	22.71	1.21	br-ko	42.49	3.46		27.85	0.63
			me-ma	29.17	2.78	br-ma	58.31	6.22			
			me-ph	32.41	1.75	br-ph	46.82	3.42			
			me-ta	.	.	br-ta	.	.			
			me-th	24.15	1.41	br-th	43.85	4.39			
						co-indi	64.85	3.53			
						co-indo	37.81	2.46			
						co-ko	33.55	2.30			
						co-ma	68.77	3.91			
						co-ph	46.32	2.00			
						co-ta	.	.			
						co-th	36.23	2.10			

Notes:

1) Table D reports descriptive statistics for the volatility of relative price across regions that are located in different continents. The volatility measure $V(q_{ij})$ is computed as described in the footnotes of table 1. A description of the used country short names is given in table B.

Table E: U.S. Sample, Regression Results for Individual Border Estimates, Overall Period and Subperiods, Volatility Measure 1, Detailed Results

Country Pair	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
	1991.01-2001.06		**1991.01-1994.11**		**1994.12-1997.06**		**1997.07-1998.12**		**1999.01-2001.06**	
(ln)distance	1.15	12.16	0.48	4.78	0.58	5.52	1.15	5.94	0.74	4.53
North America - North America										
us-ca	11.61	33.12	11.28	57.07	9.69	39.06	11.46	13.05	11.71	33.87
us-me	53.86	89.35	13.68	67.32	82.01	234.42	39.48	58.80	21.86	41.91
ca-me	53.61	303.06	17.57	109.59	77.84	257.54	37.57	139.38	21.14	73.29
South America - South America										
ar-bo	6.47	15.10	7.13	13.38	5.49	10.17	5.53	8.23	.	.
ar-br	23.99	70.69	35.41	76.59	7.25	24.17	1.89	4.43	.	.
ar-co	30.94	87.85	34.12	82.99	20.41	58.85	42.30	60.25	.	.
bo-br	47.93	113.29	14.76	18.77	9.88	19.57	4.32	6.66	57.35	69.14
bo-co	32.08	75.22	34.72	72.34	22.26	42.05	42.56	56.27	32.52	39.84
br-co	56.53	173.68	36.50	76.83	24.26	80.97	40.37	69.46	69.12	189.40
Asia - Asia										
indi-indo	124.93	422.94	45.98	177.35	20.05	72.81	334.14	414.04	78.05	121.25
indi-ko	62.69	213.98	46.64	143.86	24.44	74.73	154.65	215.30	20.76	44.72
indi-ma	40.69	96.16	4.61	3.71	17.11	43.96	93.12	122.00	4.11	6.39
indi-ph	43.56	171.77	43.85	127.54	24.41	67.65	75.10	128.21	17.13	42.50
indi-ta	15.56	46.52	.	.	12.34	30.76	24.02	34.59	10.88	21.53
indi-th	56.30	222.06	44.11	140.76	21.34	78.50	121.20	180.04	23.06	61.49
indo-ko	98.94	296.29	4.30	15.08	11.03	33.19	269.07	331.28	75.11	102.26
indo-ma	123.61	309.50	10.43	8.14	7.19	18.68	281.86	406.05	77.23	102.61
indo-ph	104.69	366.94	17.95	78.94	9.80	30.85	294.93	367.44	67.01	111.07
indo-ta	163.99	428.69	.	.	7.30	17.91	322.03	386.44	74.69	100.89
indo-th	94.22	308.51	7.45	25.86	4.06	13.83	261.31	356.33	63.03	101.96
ko-ma	57.19	152.43	9.90	8.53	14.60	36.19	133.90	257.58	20.66	28.11
ko-ph	48.28	179.76	18.18	61.71	21.35	60.88	129.45	207.75	23.87	58.87
ko-ta	73.24	239.88	.	.	10.47	28.52	143.71	223.94	16.48	37.26
ko-th	42.68	141.71	7.71	21.02	7.71	23.16	100.48	177.44	25.34	55.83
ma-ph	29.68	83.53	17.59	15.23	15.66	34.48	58.45	118.76	23.45	41.75
ma-ta	38.24	86.34	.	.	10.17	20.81	77.55	104.24	12.57	19.15
ma-th	32.83	83.95	6.59	5.58	9.37	21.39	54.35	128.15	23.25	40.09
ph-ta	32.86	116.37	.	.	7.11	16.80	59.47	98.96	23.65	64.43
ph-th	30.59	119.89	20.17	65.93	14.95	45.46	67.06	126.50	17.38	47.48
ta-th	56.53	150.77	.	.	4.78	11.86	103.64	139.85	25.42	51.06

... to be continued

Table E: ... continued

Country Pair	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
	1991.01-2001.06		**1991.01-1994.11**		**1994.12-1997.06**		**1997.07-1998.12**		**1999.01-2001.06**	
North America - Asia										
us-indi	26.50	57.40	43.46	120.62	22.72	53.87	13.08	10.59	2.99	5.89
us-indo	120.23	124.75	2.40	7.33	1.47	3.99	347.99	131.96	72.75	68.37
us-ko	58.54	134.30	3.12	8.26	13.32	28.40	173.60	190.34	22.62	31.69
us-ma	41.32	41.28	7.76	6.12	9.58	19.93	100.80	33.88	-0.54	-0.58
us-ph	32.66	77.10	18.18	47.27	9.33	21.43	79.96	74.27	20.45	39.69
us-ta	18.73	38.81	.	.	7.11	14.92	37.22	37.50	13.17	18.72
us-th	46.79	65.01	4.36	9.98	4.30	10.63	127.92	42.10	23.16	35.88
ca-indi	31.36	122.26	50.41	163.41	21.39	71.49	15.66	24.95	10.52	23.37
ca-indo	123.99	383.90	8.42	29.81	6.62	22.70	350.88	452.54	70.95	94.51
ca-ko	58.02	194.24	12.90	39.70	11.62	34.93	167.00	277.36	18.82	36.19
ca-ma	42.93	113.76	19.59	17.01	11.75	28.41	101.68	196.47	11.08	16.33
ca-ph	34.14	120.01	19.91	59.54	16.09	44.15	76.89	124.04	22.98	46.05
ca-ta	19.70	51.81	.	.	10.55	25.58	34.70	48.89	16.72	27.95
ca-th	48.65	159.47	12.03	34.34	7.09	20.61	128.46	230.77	21.12	41.02
me-indi	60.89	190.57	48.21	141.73	73.47	164.01	42.27	63.38	19.98	38.02
me-indo	141.15	388.20	12.71	42.73	75.75	177.85	367.42	446.96	74.40	94.97
me-ko	84.43	238.67	16.00	44.49	81.25	178.45	176.43	258.22	31.24	54.34
me-ma	85.46	208.81	22.50	19.81	75.89	146.32	130.47	232.00	20.77	29.11
me-ph	63.59	188.93	22.76	65.64	69.13	141.25	89.21	131.38	29.96	56.43
me-ta	31.56	75.85	.	.	11.88	20.81	53.59	69.96	28.71	44.90
me-th	78.78	224.17	17.53	46.65	79.30	175.76	147.63	233.58	32.94	60.09
North America - Pacific										
us-ja	42.46	69.86	27.05	88.70	57.52	186.14	65.94	42.41	38.01	77.68
ca-ja	43.49	180.27	32.43	122.80	54.02	127.97	60.18	121.21	39.46	86.78
me-ja	73.15	247.24	36.81	125.16	99.77	232.89	83.29	149.41	46.89	97.43

... to be continued

Table E: ... continued

Country Pair	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
	1991.01-2001.06		**1991.01-1994.11**		**1994.12-1997.06**		**1997.07-1998.12**		**1999.01-2001.06**	
South America - Asia										
ar-indi	34.88	89.75	49.35	109.05	19.41	47.68	12.61	15.56	.	.
ar-indo	134.57	319.82	12.60	31.08	0.64	1.58	349.63	380.36	.	.
ar-ko	63.42	143.47	15.21	31.48	10.76	21.51	169.00	189.50	.	.
ar-ma	52.00	107.66	4.84	3.87	7.48	12.33	103.78	141.45	.	.
ar-ph	33.85	79.20	21.83	45.55	7.00	12.79	79.27	92.99	.	.
ar-ta	23.67	44.09	.	.	5.31	10.04	37.90	39.75	.	.
ar-th	53.72	129.03	15.86	32.22	2.08	3.71	131.70	162.01	.	.
bo-indi	20.23	41.93	35.52	64.32	25.81	42.00	16.61	16.57	3.89	4.00
bo-indo	133.28	260.37	3.90	7.88	3.51	5.25	356.57	338.75	69.49	61.83
bo-ko	64.65	121.99	7.50	13.59	11.22	16.48	179.10	182.16	12.17	11.03
bo-ma	43.39	79.24	14.21	7.18	12.36	14.82	107.65	109.81	0.29	0.21
bo-ph	34.27	68.52	21.28	39.84	9.82	13.17	82.66	85.13	20.73	21.37
bo-ta	19.05	32.48	.	.	9.23	12.19	41.38	37.31	7.89	7.52
bo-th	52.43	102.38	6.53	11.97	4.96	6.92	137.55	147.70	20.89	18.70
br-indi	53.95	153.09	47.80	94.54	23.68	64.44	16.54	25.35	63.92	132.69
br-indo	129.55	328.02	25.69	54.73	7.78	22.42	355.41	436.11	84.28	109.72
br-ko	78.71	189.09	25.88	48.09	17.83	41.44	172.31	230.31	53.48	85.15
br-ma	73.16	157.37	41.90	27.87	12.83	26.35	107.03	189.90	60.47	84.06
br-ph	57.86	148.34	27.34	49.75	7.72	17.21	80.45	113.71	59.54	106.69
br-ta	63.32	135.53	.	.	7.74	14.74	40.71	50.04	55.86	82.54
br-th	67.51	174.63	27.50	49.52	11.82	28.88	134.30	213.88	57.21	104.64
co-indi	40.72	102.24	49.58	110.97	21.49	49.87	51.45	62.41	36.78	59.28
co-indo	128.26	290.90	24.66	56.65	15.74	37.70	362.46	365.33	82.29	95.15
co-ko	61.72	136.94	23.15	47.04	25.08	53.60	164.66	175.40	44.74	65.08
co-ma	53.05	108.04	58.42	45.26	21.07	37.97	111.16	131.52	32.23	41.35
co-ph	36.34	84.46	32.98	67.76	25.80	53.18	71.21	77.77	38.47	60.01
co-ta	40.88	84.83	.	.	14.86	23.61	60.71	62.88	44.41	59.55
co-th	50.04	114.18	25.96	53.23	18.05	39.43	126.77	136.58	34.86	53.79

... to be continued

Table E: ... continued

Country Pair	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
	1991.01-2001.06		**1991.01-1994.11**		**1994.12-1997.06**		**1997.07-1998.12**		**1999.01-2001.06**	
North America - South America										
us-ar	8.44	13.93	13.33	27.43	0.29	0.69	-2.78	-2.66	.	.
us-bo	4.19	5.45	4.36	10.40	6.77	11.60	5.32	4.05	2.82	120.62
us-br	50.72	67.98	24.14	28.31	9.86	29.09	1.66	1.85	58.49	7.33
us-co	31.36	65.25	27.22	84.36	21.55	67.34	47.95	37.81	34.09	8.26
ca-ar	14.47	45.01	17.83	48.31	6.66	21.52	8.54	14.69	.	.
ca-bo	11.97	28.78	11.37	27.71	12.40	23.51	14.37	20.39	10.66	6.12
ca-br	53.24	196.89	29.20	70.46	15.89	62.26	7.78	19.53	57.01	47.27
ca-co	36.63	135.31	36.07	117.20	24.65	88.82	46.65	83.94	39.49	.
me-ar	61.68	187.66	17.57	51.00	77.17	162.66	37.70	63.40	.	.
me-bo	58.58	146.01	14.77	36.30	79.78	127.97	38.13	53.70	19.08	9.98
me-br	78.67	262.84	34.80	81.79	79.64	208.45	34.98	81.75	60.66	163.41
me-co	65.54	234.88	43.06	149.76	80.78	205.37	44.21	84.00	36.45	29.81
South America - Pacific										
ar-ja	42.53	107.47	33.52	76.28	52.70	110.79	62.26	80.13	.	.
bo-ja	40.21	82.10	28.81	59.20	49.94	80.11	62.08	66.80	29.60	27.38
br-ja	68.28	184.50	42.22	80.23	58.67	151.14	65.25	103.36	73.32	134.19
co-ja	53.13	134.47	35.47	80.15	42.83	97.98	97.40	122.72	64.68	107.96
Asia - Pacific										
indi-ja	47.55	187.00	56.23	187.24	50.43	136.21	41.97	70.18	29.74	62.82
indo-ja	122.39	419.36	25.36	89.88	50.72	176.56	319.05	434.43	92.72	137.21
ja-ko	69.45	474.40	29.34	192.30	46.28	225.91	171.52	609.94	40.09	192.65
ja-ma	53.93	154.41	20.38	17.80	51.64	128.86	87.85	212.41	37.75	61.62
ja-ph	54.70	250.25	40.24	160.52	63.39	198.52	81.90	162.51	52.89	158.33
ja-ta	33.77	124.81	.	.	33.05	93.78	39.13	77.72	32.95	76.46
ja-th	58.57	221.29	21.22	66.30	47.01	143.66	123.21	260.85	53.06	134.88
R^2	0.997		0.989		0.995		0.998		0.992	
R^2_{adj}	0.997		0.989		0.995		0.998		0.992	
s.e.r.	0.002		0.002		0.002		0.005		0.002	

Notes:

1) Table E reports results from estimating equation (1) in section 4 of the main text. The dependent variable is volatility measure 1. For each country pair one border dummy variable is included in the regression equation. The total number of estimated border dummies is 105. Summary results are reported in table 5. There are 11,026 observations. (Exceptions: No Taiwanese data are available for the first subperiod, no Argentinean data are available for the last subperiod). For further notes, see the footnotes of table 2.

Table F: U.S. Sample, Sensitivity Analysis: Quadratic Distance Function, Overall Period, Volatility Measure 1, Detailed Results

Variable	Coeff.	t-stat	Variable	Coeff.	t-stat	Variable	Coeff.	t-stat
distance	0.71	6.34	$dist^2$	-0.04	-4.15			
North Am.-North Am.			**North Am.-South Am.**			**South Am. - Asia**		
us-ca	11.77	33.61	us-ar	8.67	13.29	ar-indi	35.10	64.66
us-me	54.31	89.44	us-bo	5.30	6.28	ar-indo	134.67	236.37
ca-me	54.09	286.31	us-br	50.84	64.79	ar-ko	64.63	109.48
South Am.-South Am.			us-co	32.22	66.40	ar-ma	52.18	82.66
ar-bo	7.70	14.62	ca-ar	14.62	35.73	ar-ph	34.48	58.05
ar-br	24.46	68.76	ca-bo	12.98	23.68	ar-ta	25.08	37.87
ar-co	31.97	88.78	ca-br	53.29	150.10	ar-th	54.25	94.92
bo-br	49.22	94.56	ca-co	37.41	130.59	bo-indi	21.22	31.71
bo-co	33.89	67.11	me-ar	62.10	155.51	bo-indo	134.25	191.44
br-co	57.41	170.72	me-bo	59.88	114.71	bo-ko	66.50	97.99
Asia-Asia			me-br	78.91	207.54	bo-ma	44.46	59.41
indi-indo	125.39	397.25	me-co	66.53	242.02	bo-ph	35.77	51.01
indi-ko	64.03	218.59	**North Am.-Asia**			bo-ta	21.21	28.82
indi-ma	41.22	92.93	us-indi	26.47	46.77	bo-th	53.82	76.10
indi-ph	44.42	157.76	us-indo	120.12	120.19	br-indi	53.93	108.12
indi-ta	17.09	55.03	us-ko	59.35	119.69	br-indo	129.52	233.96
indi-th	57.10	240.09	us-ma	41.23	38.94	br-ko	79.67	142.90
indo-ko	100.17	311.39	us-ph	32.93	62.53	br-ma	73.18	118.29
indo-ma	123.64	304.98	us-ta	19.63	36.41	br-ph	58.40	101.51
indo-ph	105.40	386.73	us-th	46.97	59.92	br-ta	64.48	107.78
indo-ta	165.42	479.22	ca-indi	31.32	79.35	br-th	67.78	126.70
indo-th	94.82	335.07	ca-indo	123.83	266.67	co-indi	41.24	77.69
ko-ma	58.49	156.59	ca-ko	58.83	159.66	co-indo	128.92	211.70
ko-ph	49.97	233.07	ca-ma	42.78	84.48	co-ko	62.95	120.17
ko-ta	75.34	351.07	ca-ph	34.37	83.14	co-ma	53.72	82.31
ko-th	44.29	175.98	ca-ta	20.59	46.53	co-ph	37.24	66.58
ma-ph	30.30	83.49	ca-th	48.79	115.11	co-ta	42.34	76.86
ma-ta	39.67	93.75	me-indi	61.00	126.45	co-th	50.91	89.01
ma-th	33.34	91.90	me-indo	141.17	272.03	**South Am.-Pacific**		
ph-ta	34.42	154.04	me-ko	85.30	193.79	ar-ja	43.15	75.76
ph-th	31.69	142.33	me-ma	85.50	153.46	bo-ja	41.50	61.99
ta-th	58.24	182.57	me-ph	63.95	135.69	br-ja	68.73	124.87
Asia-Pacific			me-ta	32.54	65.85	co-ja	53.84	106.80
indi-ja	48.30	187.00	me-th	79.10	160.90			
indo-ja	123.07	419.36	**North Am.-Pacific**					
ja-ko	70.46	474.40	us-ja	42.77	65.02			
ja-ma	54.68	154.41	ca-ja	43.80	126.27			
ja-ph	55.87	250.25	me-ja	73.53	176.96			
ja-ta	35.46	124.81						
ja-th	59.63	221.29						
R^2	0.997	R^2_{adj}	0.997	*s.e.r.*	0.002			

Notes:

1) See the footnotes of table 6 for further details.

Table G: U.S. Sample, Sensitivity Analysis: Variables Deflated by Distance, Overall Period, Volatility Measure 1, Detailed Results

Variable	Coeff.	t-stat	Variable	Coeff.	t-stat	Variable	Coeff.	t-stat
constant	1.12	15.12						
North Am. - North Am.			**North Am. - South Am.**			**South Am. - Asia**		
us-ca	11.60	33.38	us-ar	8.49	14.71	ar-indi	35.10	101.39
us-me	53.76	90.48	us-bo	4.03	5.47	ar-indo	134.70	362.41
ca-me	53.69	316.50	us-br	50.80	69.85	ar-ko	63.54	166.50
South Am. - South Am.			us-co	31.50	69.67	ar-ma	52.13	115.07
ar-bo	6.35	16.60	ca-ar	14.52	49.35	ar-ph	33.97	89.49
ar-br	24.14	76.54	ca-bo	11.79	31.00	ar-ta	23.78	48.70
ar-co	31.14	100.32	ca-br	53.34	216.79	ar-th	53.80	142.24
bo-br	47.91	124.48	ca-co	36.74	155.03	bo-indi	20.21	45.81
bo-co	32.03	84.34	me-ar	61.91	210.11	bo-indo	133.20	283.69
br-co	56.78	199.02	me-bo	58.55	160.26	bo-ko	64.54	131.59
Asia - Asia			me-br	78.92	298.10	bo-ma	43.29	83.59
indi-indo	125.12	464.41	me-co	65.81	273.96	bo-ph	34.17	74.36
indi-ko	62.80	248.60	**North Am. - Asia**			bo-ta	18.92	34.28
indi-ma	40.80	100.24	us-indi	26.62	61.98	bo-th	52.28	109.86
indi-ph	43.69	193.73	us-indo	120.28	125.63	br-indi	54.21	176.09
indi-ta	15.66	53.23	us-ko	58.57	150.33	br-indo	129.75	379.13
indi-th	56.35	222.06	us-ma	41.38	41.37	br-ko	78.88	224.45
indo-ko	98.98	342.54	us-ph	32.71	84.99	br-ma	73.35	168.68
indo-ma	123.69	308.69	us-ta	18.75	43.03	br-ph	58.05	173.29
indo-ph	104.79	394.63	us-th	46.79	65.74	br-ta	63.47	158.17
indo-ta	164.00	474.14	ca-indi	31.46	138.16	br-th	67.64	195.91
indo-th	94.25	315.65	ca-indo	124.03	436.57	co-indi	40.99	123.73
ko-ma	57.23	162.89	ca-ko	58.02	225.73	co-indo	128.47	350.16
ko-ph	48.31	206.58	ca-ma	42.95	120.16	co-ko	61.89	166.45
ko-ta	73.21	275.26	ca-ph	34.15	137.05	co-ma	53.25	123.05
ko-th	42.65	153.67	ca-ta	19.69	57.48	co-ph	36.53	102.42
ma-ph	29.71	84.42	ca-th	48.61	171.52	co-ta	41.04	103.67
ma-ta	38.25	92.97	me-indi	61.13	224.91	co-th	50.18	133.95
ma-th	32.87	81.42	me-indo	141.33	456.88	**South Am. - Pacific**		
ph-ta	32.88	126.49	me-ko	84.58	287.35	ar-ja	42.64	124.46
ph-th	30.56	123.03	me-ma	85.63	227.97	bo-ja	40.09	88.62
ta-th	56.46	162.90	me-ph	63.75	222.68	br-ja	68.44	218.65
Asia - Pacific			me-ta	31.70	89.64	co-ja	53.29	164.76
indi-ja	47.64	213.88	me-th	78.90	254.14			
indo-ja	122.42	478.89	**North Am. - Pacific**					
ja-ko	69.43	522.02	us-ja	42.50	73.02			
ja-ma	53.96	162.02	ca-ja	43.48	207.65			
ja-ph	54.70	281.97	me-ja	73.28	297.15			
ja-ta	33.74	143.22						
ja-th	58.53	236.20						
R^2	0.997	R^2_{adj}	0.997	$s.e.r.$	0.0002			

Notes:

1) See the footnotes of table 6 for further details.

Table H: U.S. Sample, Sensitivity Analysis: Volatility Measure 2, Overall Period, Detailed Results

Variable	Coeff.	t-stat	Variable	Coeff.	t-stat	Variable	Coeff.	t-stat
distance	0.78	2.56						
North Am. - North Am.			**North Am. - South Am.**			**South Am. - Asia**		
us-ca	30.72	70.04	us-ar	17.99	19.24	ar-indi	50.59	42.01
us-me	72.66	105.61	us-bo	18.79	12.56	ar-indo	97.91	52.93
ca-me	79.06	156.75	us-br	66.19	46.70	ar-ko	65.55	44.66
South Am. - South Am.			us-co	69.36	62.92	ar-ma	92.79	43.47
ar-bo	23.29	18.16	ca-ar	41.34	50.01	ar-ph	73.61	52.73
ar-br	40.66	43.59	ca-bo	39.78	30.62	ar-ta	62.40	34.88
ar-co	67.92	65.20	ca-br	79.24	95.00	ar-th	64.63	45.53
bo-br	55.63	42.01	ca-co	91.83	114.30	bo-indi	39.15	22.94
bo-co	73.48	54.11	me-ar	96.97	98.80	bo-indo	159.60	71.95
br-co	94.20	105.53	me-bo	85.50	64.94	bo-ko	50.89	29.10
Asia - Asia			me-br	123.14	133.20	bo-ma	62.49	23.34
indi-indo	187.81	164.44	me-co	99.38	122.48	bo-ph	75.71	44.01
indi-ko	83.68	79.31	**North Am. - Asia**			bo-ta	43.83	20.47
indi-ma	67.95	36.58	us-indi	37.04	35.79	bo-th	59.41	34.68
indi-ph	92.62	102.04	us-indo	141.38	81.01	br-indi	84.70	72.93
indi-ta	41.16	37.73	us-ko	40.89	33.58	br-indo	193.20	128.71
indi-th	74.45	76.48	us-ma	59.18	24.97	br-ko	89.90	66.18
indo-ko	107.08	89.23	us-ph	73.50	65.95	br-ma	123.46	60.44
indo-ma	167.30	68.59	us-ta	45.32	33.82	br-ph	102.00	80.28
indo-ph	108.13	102.38	us-th	56.73	45.78	br-ta	103.64	69.07
indo-ta	304.73	173.71	ca-indi	53.56	62.01	br-th	112.93	83.04
indo-th	103.25	63.94	ca-indo	139.61	115.53	co-indi	83.07	63.49
ko-ma	107.09	88.34	ca-ko	59.79	61.04	co-indo	139.96	100.56
ko-ph	78.34	91.63	ca-ma	62.33	50.24	co-ko	104.99	76.00
ko-ta	95.94	103.03	ca-ph	81.93	83.78	co-ma	103.56	56.77
ko-th	63.84	63.80	ca-ta	52.51	46.42	co-ph	90.22	66.04
ma-ph	72.63	74.99	ca-th	68.45	71.23	co-ta	123.62	78.90
ma-ta	62.61	35.78	me-indi	84.57	83.11	co-th	81.81	60.60
ma-th	63.58	65.43	me-indo	224.05	183.25	**South Am. - Pacific**		
ph-ta	77.84	62.41	me-ko	108.24	96.49	ar-ja	97.17	79.23
ph-th	72.23	73.46	me-ma	145.37	109.41	bo-ja	107.86	62.38
ta-th	110.24	86.72	me-ph	101.73	96.47	br-ja	149.19	123.05
Asia - Pacific			me-ta	81.44	62.24	co-ja	114.16	91.62
indi-ja	94.34	96.53	me-th	126.16	112.94			
indo-ja	188.75	161.72	**North Am. - Pacific**					
ja-ko	113.15	206.68	us-ja	103.62	91.40			
ja-ma	122.96	114.08	ca-ja	103.53	128.43			
ja-ph	144.80	184.13	me-ja	154.29	166.76			
ja-ta	82.52	90.71						
ja-th	107.81	108.73						
R^2	0.981	R^2_{adj}	0.981	$s.e.r.$	0.008			

Notes:

1) See the footnotes of table 6 for further details.

Table I: U.S. Sample, Sensitivity Analysis: Volatility Measure 3, Overall Period, Detailed Results

Variable	Coeff.	t-stat	Variable	Coeff.	t-stat	Variable	Coeff.	t-stat
distance	1.16	10.42						
North Am. - North Am.			**North Am. - South Am.**			**South Am. - Asia**		
us-ca	9.00	8.53	us-ar	1.76	1.34	ar-indi	17.02	46.17
us-me	41.58	40.67	us-bo	2.20	1.54	ar-indo	74.27	193.36
ca-me	33.64	207.40	us-br	41.54	33.10	ar-ko	28.00	60.81
South Am. - South Am.			us-co	24.55	24.28	ar-ma	37.22	80.61
ar-bo	1.06	3.25	ca-ar	6.64	24.09	ar-ph	16.13	39.14
ar-br	14.28	61.26	ca-bo	6.04	16.52	ar-ta	13.52	25.66
ar-co	20.95	59.20	ca-br	28.85	117.50	ar-th	29.04	69.77
bo-br	24.17	71.71	ca-co	23.87	77.02	bo-indi	11.18	22.34
bo-co	21.91	48.53	me-ar	35.37	124.78	bo-indo	78.38	158.39
br-co	33.48	102.31	me-bo	34.64	93.78	bo-ko	27.85	49.97
Asia - Asia			me-br	43.54	160.78	bo-ma	27.16	51.41
indi-indo	75.10	311.63	me-co	40.35	134.37	bo-ph	16.32	31.39
indi-ko	32.96	103.67	**North Am. - Asia**			bo-ta	9.89	16.48
indi-ma	27.34	83.29	us-indi	17.95	17.76	bo-th	27.94	53.55
indi-ph	24.57	90.0	us-indo	102.43	63.64	br-indi	27.86	81.68
indi-ta	9.34	27.62	us-ko	46.95	38.47	br-indo	72.74	209.34
indi-th	34.29	146.01	us-ma	33.50	19.27	br-ko	37.04	84.31
indo-ko	65.46	216.09	us-ph	25.83	26.59	br-ma	41.83	101.17
indo-ma	80.09	269.04	us-ta	14.43	12.72	br-ph	30.94	77.66
indo-ph	65.06	295.54	us-th	38.95	32.75	br-ta	33.47	70.31
indo-ta	103.09	320.45	ca-indi	15.55	55.40	br-th	38.03	97.13
indo-th	62.28	263.01	ca-indo	75.96	257.41	co-indi	25.84	57.19
ko-ma	34.35	96.81	ca-ko	29.75	87.89	co-indo	77.37	171.43
ko-ph	28.02	99.48	ca-ma	27.62	75.92	co-ko	32.98	64.10
ko-ta	39.44	131.00	ca-ph	18.26	57.42	co-ma	31.45	61.70
ko-th	25.11	77.81	ca-ta	12.23	30.16	co-ph	20.04	40.59
ma-ph	18.82	61.73	ca-th	27.92	84.36	co-ta	24.43	44.43
ma-ta	27.10	68.56	me-indi	35.77	105.19	co-th	28.04	56.18
ma-th	22.23	60.34	me-indo	86.49	255.86	**South Am. - Pacific**		
ph-ta	25.74	87.90	me-ko	46.90	119.61	ar-ja	19.53	49.03
ph-th	16.22	58.43	me-ma	55.54	140.36	bo-ja	20.97	41.37
ta-th	37.24	102.90	me-ph	39.00	107.20	br-ja	36.72	96.96
Asia - Pacific			me-ta	20.66	47.14	co-ja	32.62	71.36
indi-ja	25.00	93.58	me-th	47.06	123.68			
indo-ja	77.00	306.12	**North Am. - Pacific**					
ja-ko	33.79	227.67	us-ja	32.65	29.70			
ja-ma	33.63	105.81	ca-ja	23.24	84.02			
ja-ph	30.24	130.23	me-ja	42.90	131.71			
ja-ta	24.04	85.90						
ja-th	32.92	117.07						
R^2	0.988	R^2_{adj}	0.988	$s.e.r.$	0.003			

Notes:

1) See the footnotes of table 6 for further details.

Table J: EMU Sample, Regression Results for Individual Border Estimates, Overall Period and Subperiods, Volatility Measure 1, Detailed Results

Country Pair	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
	1991.01-2001.06		**1991.01-1994.11**		**1994.12-1997.06**		**1997.07-1998.12**		**1999.01-2001.06**	
(ln)distance	1.11	2.71	0.86	7.64	0.72	6.79	0.96	5.55	1.06	6.73
EMU - EMU										
ge-it	24.77	46.58	26.89	32.63	40.78	297.64	0.83	4.63	0.36	2.03
ge-sp	12.62	23.16	16.83	20.43	15.78	86.39	1.44	5.37	0.26	1.04
ge-po	11.40	19.58	16.46	18.45	17.09	69.27	1.54	4.23	1.09	3.16
it-sp	20.94	159.24	29.01	155.20	27.05	175.24	1.14	4.96	0.24	1.07
it-po	19.27	94.83	27.77	85.87	21.84	99.89	1.94	5.59	0.24	0.79
sp-po	10.35	65.10	14.11	51.91	9.94	62.57	4.77	18.34	1.96	9.95
South America - South America										
ar-bo	6.53	14.76	6.60	12.58	5.30	9.84	5.79	8.30	.	.
ar-br	24.03	70.95	35.09	75.33	7.14	22.68	2.05	4.63	.	.
ar-co	31.04	86.28	33.34	77.47	20.13	56.55	42.68	61.16	.	.
bo-br	48.01	110.85	14.12	17.59	9.65	19.72	4.63	6.78	56.82	72.58
bo-co	32.19	74.68	33.82	70.80	21.93	42.68	43.01	57.08	31.75	41.28
br-co	56.62	172.82	35.81	73.64	24.01	80.03	40.71	70.04	68.54	193.22
Asia - Asia										
indi-indo	125.00	430.23	45.44	166.95	19.86	70.64	334.40	428.49	77.61	117.96
indi-ko	62.81	224.35	45.67	129.60	24.09	73.85	155.13	234.00	19.94	42.99
indi-ma	40.75	96.61	4.09	3.74	16.93	41.65	93.38	133.15	3.67	5.76
indi-ph	43.66	174.23	43.07	123.98	24.13	63.55	75.48	137.18	16.48	39.97
indi-ta	15.69	47.98	.	.	11.99	29.71	24.50	38.29	10.07	20.31
indi-th	56.36	229.23	43.62	145.63	21.17	76.61	121.44	192.89	22.65	55.93
indo-ko	99.05	305.49	3.41	10.43	10.71	32.25	269.51	343.34	74.37	100.44
indo-ma	123.61	318.47	10.41	9.02	7.18	17.74	281.87	407.58	77.21	104.78
indo-ph	104.74	371.10	17.55	71.10	9.65	28.93	295.13	371.55	66.68	108.17
indo-ta	164.09	432.16	.	.	7.02	16.45	322.42	396.65	74.02	99.88
indo-th	94.26	314.24	7.08	25.02	3.93	13.33	261.49	357.14	62.72	99.98
ko-ma	57.30	162.30	9.04	9.07	14.30	34.29	134.33	281.46	19.94	28.05
ko-ph	48.40	190.55	17.29	53.73	21.03	60.28	129.88	218.95	23.12	59.06
ko-ta	73.35	248.22	.	.	10.15	26.76	144.15	234.74	15.74	36.77
ko-th	42.80	150.83	6.77	16.90	7.37	21.73	100.94	190.30	24.55	55.71
ma-ph	29.72	85.77	17.26	17.27	15.54	30.85	58.62	124.30	23.17	44.25
ma-ta	38.33	88.70	.	.	9.90	18.22	77.91	105.83	11.96	19.14
ma-th	32.86	90.26	6.32	6.30	9.27	20.77	54.49	133.42	23.02	41.04
ph-ta	32.94	119.51	.	.	6.87	15.74	59.81	101.65	23.08	64.95
ph-th	30.67	125.51	19.56	64.13	14.73	43.89	67.37	129.82	16.86	47.48
ta-th	56.63	153.94	.	.	4.48	11.01	104.05	142.39	24.73	52.29

... to be continued

Table J: ... continued										
Country Pair	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
	1991.01-2001.06		**1991.01-1994.11**		**1994.12-1997.06**		**1997.07-1998.12**		**1999.01-2001.06**	
EMU - North America										
ge-me	73.73	126.59	43.84	50.78	102.24	248.95	63.89	125.65	48.17	101.31
it-me	73.44	265.94	57.74	173.94	83.49	206.13	65.76	133.05	48.65	104.94
sp-me	73.87	276.00	54.75	172.00	91.29	229.51	65.17	135.89	47.11	104.72
po-me	73.41	260.06	47.53	127.04	92.41	233.99	61.98	124.82	46.55	104.87
EMU - South America										
ge-ar	36.04	57.04	44.81	49.23	29.57	65.77	24.66	35.72	.	.
ge-bo	27.50	37.68	25.55	22.37	25.85	43.04	31.72	40.79	33.17	37.59
ge-br	58.79	97.59	48.07	50.97	35.98	106.38	29.51	58.67	70.92	155.31
ge-co	47.55	75.68	44.90	48.61	32.43	80.64	71.20	97.30	58.62	108.94
it-ar	42.60	122.10	55.68	130.29	20.54	43.77	26.59	40.07	.	.
it-bo	32.61	73.94	43.67	92.69	19.85	30.75	33.90	44.82	33.38	38.08
it-br	63.87	204.21	60.32	122.72	16.94	52.52	31.59	66.81	72.20	167.46
it-co	53.23	146.46	54.33	119.48	31.70	73.92	72.97	102.29	58.71	112.78
sp-ar	42.23	121.39	54.54	130.73	23.91	60.69	26.34	40.27	.	.
sp-bo	32.44	74.68	43.61	96.75	19.95	34.31	33.83	45.46	32.44	37.63
sp-br	62.82	210.00	54.73	116.16	27.33	88.35	31.69	69.32	70.77	171.96
sp-co	51.74	147.39	51.51	113.65	28.15	74.08	73.67	105.71	58.44	117.07
po-ar	36.37	101.69	47.27	102.89	20.50	52.99	24.62	36.23	.	.
po-bo	30.30	67.06	36.41	74.49	18.47	31.18	31.42	38.62	32.13	36.20
po-br	57.90	184.40	47.03	89.86	21.81	68.27	29.27	57.01	70.12	175.37
po-co	47.85	134.77	46.31	94.05	24.73	63.73	69.40	96.95	56.49	117.57
EMU - Pacific										
ge-ja	40.36	69.34	31.88	36.30	40.19	109.77	55.41	100.71	54.19	107.56
it-ja	53.70	193.85	48.05	132.07	63.59	181.71	55.60	103.76	52.81	107.76
sp-ja	48.75	171.17	49.23	131.18	42.94	118.89	56.18	100.78	52.20	102.39
po-ja	46.45	153.31	42.82	99.43	47.03	126.60	51.75	87.94	52.00	97.81

... to be continued

Table J: ... continued

Country Pair	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
	1991.01-2001.06		**1991.01-1994.11**		**1994.12-1997.06**		**1997.07-1998.12**		**1999.01-2001.06**	
					EMU - Asia					
ge-indi	39.02	67.93	49.37	56.10	39.52	126.48	20.56	38.68	25.91	54.87
ge-indo	122.70	197.57	35.73	40.53	27.10	76.56	335.77	420.84	87.77	109.52
ge-ko	67.43	111.11	39.05	43.18	24.94	62.28	168.03	258.63	44.85	77.88
ge-ma	49.64	71.21	4.99	3.24	33.89	74.70	101.09	194.62	33.67	49.73
ge-ph	46.17	77.13	37.13	41.32	40.94	94.20	85.14	130.13	40.93	75.88
ge-ta	32.74	49.81	.	.	19.88	41.14	45.31	62.73	35.94	56.01
ge-th	52.89	88.46	31.76	35.48	25.00	68.58	131.68	230.46	39.10	75.51
it-indi	41.98	161.58	59.74	170.51	31.43	101.76	22.41	44.46	25.30	56.09
it-indo	127.53	377.49	50.54	144.48	22.75	70.76	334.13	428.28	89.25	113.74
it-ko	72.74	223.02	51.80	122.07	25.22	64.76	167.48	263.88	44.99	79.94
it-ma	51.45	140.51	7.90	8.19	29.05	64.60	100.44	201.06	33.18	50.10
it-ph	49.94	163.03	49.30	118.08	20.04	45.57	85.20	134.28	41.85	80.44
it-ta	36.71	100.42	.	.	24.41	52.29	46.11	65.71	36.25	58.03
it-th	58.33	193.17	44.02	101.26	24.17	66.39	131.12	238.77	39.45	79.49
sp-indi	43.24	158.06	61.11	169.30	34.17	108.51	21.64	40.83	25.54	53.14
sp-indo	126.52	365.99	46.14	125.93	22.44	64.40	334.52	419.60	88.36	110.52
sp-ko	71.13	212.21	48.39	111.49	18.44	45.89	167.94	254.94	44.96	77.20
sp-ma	52.08	138.40	11.65	11.45	28.55	64.10	102.62	197.01	32.69	48.23
sp-ph	49.74	156.19	43.75	102.42	32.67	74.50	87.37	133.34	41.34	76.54
sp-ta	36.14	95.90	.	.	19.67	39.85	46.56	64.12	35.24	54.70
sp-th	57.76	184.38	42.74	102.12	20.12	55.41	133.11	231.24	39.48	75.92
po-indi	39.24	131.98	54.53	127.34	29.49	87.83	19.33	32.99	23.34	46.10
po-indo	123.27	335.84	39.51	93.43	19.54	51.82	330.76	389.39	87.00	108.47
po-ko	68.19	194.54	41.37	85.74	47.03	126.60	164.59	236.36	44.02	74.90
po-ma	49.61	124.12	11.02	10.13	25.69	56.24	97.31	166.95	31.73	45.32
po-ph	44.19	131.16	36.25	74.31	28.43	63.45	79.65	116.69	39.71	72.82
po-ta	34.59	87.67	.	.	17.68	32.98	41.98	56.04	35.01	53.88
po-th	52.86	159.63	35.23	72.25	17.84	46.75	127.11	202.73	38.01	70.84

... to be continued

Table J: ... continued

Country Pair	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
	1991.01-2001.06		**1991.01-1994.11**		**1994.12-1997.06**		**1997.07-1998.12**		**1999.01-2001.06**	
North America - South America										
me-ar	61.78	190.38	16.77	46.38	76.88	161.46	38.10	65.82	.	.
me-bo	58.71	149.55	13.74	33.02	79.41	133.12	38.64	55.26	18.22	22.90
me-br	78.76	269.97	34.05	77.13	79.37	206.48	35.35	87.04	60.03	157.84
me-co	65.63	233.06	42.39	135.29	80.54	207.52	44.54	85.15	35.89	104.11
North America - Asia										
me-indi	61.02	201.49	47.14	127.68	73.09	164.42	42.80	67.67	19.08	36.98
me-indo	141.27	402.48	11.69	35.02	75.38	174.60	367.92	469.06	73.54	93.01
me-ko	84.60	254.92	14.72	36.62	80.80	176.70	177.06	286.47	30.17	53.89
me-ma	85.59	222.23	21.46	21.55	75.52	143.76	130.98	258.20	19.90	29.40
me-ph	63.73	198.74	21.59	56.55	68.71	139.25	89.78	142.42	28.99	56.23
me-ta	31.73	80.69	.	.	11.39	19.52	54.27	77.70	27.56	44.41
me-th	78.93	239.85	16.37	41.07	78.88	174.59	148.20	256.24	31.96	60.21
North America - Pacific										
me-ja	73.28	264.66	35.75	109.90	99.39	232.54	83.82	166.66	46.00	98.12
South America - Pacific										
ar-ja	42.69	111.72	32.26	68.58	52.25	109.78	62.88	85.61	.	.
bo-ja	40.41	85.98	27.25	53.56	49.38	82.14	62.85	73.35	28.30	27.17
br-ja	68.43	195.17	41.02	74.81	58.24	149.48	65.83	114.80	72.32	136.50
co-ja	53.29	139.96	34.13	71.14	42.36	96.95	98.05	130.68	63.56	110.20
Asia - Pacific										
indi-ja	47.65	199.88	55.40	175.18	50.13	138.75	42.38	75.82	29.05	66.14
indo-ja	122.48	430.43	24.65	89.17	50.46	178.13	319.40	449.66	92.13	134.28
ja-ko	69.50	487.28	28.94	172.91	46.14	224.41	171.72	648.95	39.76	192.99
ja-ma	54.01	164.55	19.68	20.44	51.39	125.30	88.19	235.78	37.17	64.44
ja-ph	54.79	260.98	39.52	151.15	63.13	196.86	82.26	172.44	52.28	161.44
ja-ta	33.86	130.25	.	.	32.77	95.59	39.51	83.94	32.29	76.45
ja-th	58.67	235.67	20.42	66.75	46.72	142.44	123.61	282.11	52.39	137.98

... to be continued

Table J: ... continued

Country Pair	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
	1991.01-2001.06		**1991.01-1994.11**		**1994.12-1997.06**		**1997.07-1998.12**		**1999.01-2001.06**	
					South America - Asia					
ar-indi	35.02	92.38	48.24	102.14	19.01	45.92	13.16	16.65	.	.
ar-indo	134.70	324.97	11.56	26.24	0.27	0.64	350.14	393.50	.	.
ar-ko	63.60	150.04	13.74	26.08	10.23	20.16	169.73	204.03	.	.
ar-ma	52.13	111.44	3.75	3.34	7.09	11.30	104.32	150.46	.	.
ar-ph	34.01	81.30	20.55	39.73	6.54	11.68	79.89	98.12	.	.
ar-ta	23.86	45.86	.	.	4.76	8.76	38.66	43.28	.	.
ar-th	53.88	134.43	14.63	29.38	1.64	2.89	132.31	171.65	.	.
bo-indi	20.41	42.94	34.08	60.03	25.30	42.09	17.32	17.63	2.69	2.86
bo-indo	133.45	266.77	2.52	4.69	3.01	4.62	357.26	358.61	68.33	61.88
bo-ko	64.88	128.10	5.73	9.41	10.59	15.74	179.97	198.68	10.69	9.95
bo-ma	43.57	82.84	12.78	6.72	11.85	13.59	108.36	121.65	-0.91	-0.68
bo-ph	34.47	71.34	19.67	33.84	9.25	13.23	83.45	92.16	19.38	20.72
bo-ta	19.29	34.49	.	.	8.57	11.40	42.29	41.51	6.34	6.24
bo-th	52.62	107.00	4.96	8.65	4.40	6.18	138.33	160.82	19.57	18.03
br-indi	54.07	159.66	46.80	89.46	23.32	63.35	17.04	27.13	63.08	133.47
br-indo	129.67	336.29	24.71	50.27	7.43	20.96	355.89	457.03	83.46	107.31
br-ko	78.89	199.63	24.49	42.32	17.33	39.83	172.99	254.82	52.32	85.98
br-ma	73.29	161.14	40.88	28.61	12.46	25.11	107.53	209.88	59.62	86.91
br-ph	58.02	154.92	26.11	45.42	7.29	16.12	81.05	123.18	58.52	108.58
br-ta	63.51	140.82	.	.	7.22	13.63	41.43	55.83	54.64	83.61
br-th	67.65	183.40	26.36	47.18	11.41	27.65	134.86	233.23	56.26	106.75
co-indi	40.88	104.19	48.31	100.01	21.04	48.41	52.07	65.83	35.72	58.08
co-indo	128.42	297.04	23.41	49.65	15.29	36.15	363.07	378.24	81.24	92.94
co-ko	61.91	142.95	21.60	39.61	24.52	51.95	165.42	186.13	43.44	65.64
co-ma	53.21	110.86	57.14	49.71	20.61	35.12	111.79	135.41	31.16	42.11
co-ph	36.52	86.77	31.56	60.52	25.30	51.38	71.91	81.58	37.28	60.31
co-ta	41.09	88.77	.	.	14.28	22.16	61.51	67.92	43.04	59.89
co-th	50.22	118.09	24.56	47.43	17.55	37.57	127.46	140.93	33.69	54.12
R^2	0.999		0.991		0.995		0.999		0.996	
R^2_{adj}	0.999		0.990		0.995		0.999		0.996	
$s.e.r.$	0.001		0.002		0.002		0.003		0.002	

Notes:

1) Table J reports results from estimating equation (1) in section 4 of the main text. The dependent variable is volatility measure 1. For each country pair one border dummy variable is included in the regression equation. The total number of estimated border dummies is 136. Summary results are reported in table 8. There are 13,861 observations. (Exceptions: No Taiwanese data are available for the first subperiod, no Argentinean data are available for the last subperiod). For further notes, see the footnotes of table 2.

Table K: Pacific Sample, Regression Results for Individual Border Estimates, Overall Period and Subperiods, Volatility Measure 1, Detailed Results

Country Pair	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
	1991.01-2001.06		**1991.01-1994.11**		**1994.12-1997.06**		**1997.07-1998.12**		**1999.01-2001.06**	
(ln)distance	1.15	9.29	1.22	7.50	0.71	5.13	1.02	4.10	1.64	7.69
Pacific - Pacific										
au-ne	29.21	58.06	21.60	29.08	37.21	185.02	24.36	69.37	22.98	70.75
au-ja	64.39	224.19	46.57	121.00	105.83	279.09	33.70	59.11	47.45	92.46
ne-ja	58.59	124.09	20.23	20.06	70.28	158.87	37.44	51.22	50.83	79.51
South America - South America										
au-bo	9.86	16.69	9.05	0.01	7.04	10.70	7.62	7.88	.	.
au-br	30.32	70.15	43.16	0.04	5.48	14.30	3.35	5.61	.	.
au-co	41.57	85.94	44.66	0.04	29.01	60.71	50.93	55.24	.	.
bo-br	58.86	106.17	16.34	0.02	7.74	12.30	6.60	6.78	41.89	74.27
bo-co	43.93	72.31	43.29	0.04	31.83	49.54	51.71	48.96	65.66	52.84
br-co	71.77	166.82	42.75	0.04	33.36	84.31	47.14	62.78	73.15	127.95
Asia - Asia										
indi-indo	155.56	401.70	59.33	160.74	25.14	66.08	425.11	386.86	91.37	108.72
indi-ko	81.04	210.84	57.57	117.71	30.93	68.22	202.52	209.69	22.08	36.30
indi-ma	49.98	97.56	4.84	2.85	19.19	41.23	108.64	95.31	4.49	5.49
indi-ph	55.53	164.64	52.81	104.25	28.62	53.16	80.98	103.94	19.72	37.29
indi-ta	18.56	44.30	.	.	8.60	15.49	30.50	34.12	10.09	14.92
indi-th	72.00	216.07	56.19	124.89	24.83	56.31	148.59	159.93	28.23	51.27
indo-ko	118.62	270.04	4.14	9.18	15.22	35.48	333.06	297.58	82.82	85.85
indo-ma	151.54	300.75	12.24	7.46	10.05	21.95	358.96	370.16	90.05	101.27
indo-ph	130.96	344.23	24.89	74.87	13.29	30.47	381.11	341.43	78.73	99.66
indo-ta	198.90	403.60	.	.	7.63	15.26	403.23	356.70	82.98	86.49
indo-th	120.95	304.58	8.78	20.78	4.54	9.85	346.67	346.59	74.76	91.32
ko-ma	70.53	149.59	9.00	5.79	20.00	45.36	161.77	243.03	23.46	31.47
ko-ph	61.58	174.75	23.43	52.67	28.32	56.27	160.43	194.68	23.38	43.43
ko-ta	91.51	242.05	.	.	12.64	26.69	182.39	229.05	15.76	26.80
ko-th	56.65	143.45	8.19	14.58	10.91	23.33	122.39	162.13	23.63	38.29
ma-ph	35.91	80.42	21.16	13.47	20.87	36.64	61.85	103.29	28.50	45.35
ma-ta	42.62	73.86	.	.	14.03	25.07	78.00	74.39	15.60	19.88
ma-th	39.80	82.91	7.19	4.50	11.51	22.31	59.89	110.57	29.20	42.74
ph-ta	38.97	110.57	.	.	7.14	11.78	52.98	73.97	27.42	55.96
ph-th	38.84	110.41	24.69	54.93	19.75	39.62	81.14	114.85	19.54	39.01
ta-th	69.56	155.44	.	.	5.91	10.89	118.16	131.49	28.38	43.50

... to be continued

Table K: ... continued

Country Pair	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
	1991.01-2001.06		**1991.01-1994.11**		**1994.12-1997.06**		**1997.07-1998.12**		**1999.01-2001.06**	
North America - South America										
me-ar	80.17	177.82	18.64	39.18	95.47	165.22	38.03	44.94	.	.
me-bo	77.89	140.59	16.75	24.11	99.41	135.45	38.24	37.12	18.54	22.29
me-br	104.65	266.46	43.70	80.02	94.89	193.26	32.92	59.04	59.78	120.32
me-co	87.35	231.46	54.13	126.51	97.29	200.98	51.82	79.47	48.50	102.33
North America - Asia										
me-indi	78.44	182.90	60.18	115.32	83.22	137.49	47.98	53.87	20.83	31.12
me-indo	177.64	367.19	14.29	30.02	94.23	171.47	470.53	420.00	82.79	80.03
me-ko	110.02	236.12	19.79	34.57	102.55	174.53	230.15	261.74	31.24	41.64
me-ma	108.24	208.36	24.89	15.80	92.20	153.94	150.02	212.53	20.65	24.88
me-ph	84.25	186.96	29.74	54.24	84.28	129.11	99.83	112.22	31.50	45.07
me-ta	40.09	74.96	.	.	13.18	17.88	71.86	74.85	29.77	35.73
me-th	101.81	219.90	21.14	36.39	98.31	162.87	176.81	217.49	37.07	49.81
Pacific - South America										
au-ar	35.96	76.63	34.61	62.30	24.94	35.00	58.59	65.09	.	.
au-bo	33.77	58.34	32.67	48.06	33.18	47.28	60.25	54.61	25.34	24.79
au-br	74.94	183.81	38.10	56.51	27.92	58.41	61.49	90.46	65.27	109.25
au-co	50.37	107.94	35.84	59.55	52.31	96.72	68.54	68.50	68.28	98.05
ne-ar	34.08	51.80	7.40	5.61	17.36	35.43	47.61	51.01	.	.
ne-bo	33.26	45.71	9.97	5.75	18.00	24.14	48.69	43.42	31.45	28.27
ne-br	82.53	133.35	19.90	12.87	19.02	42.15	54.02	71.82	75.65	99.97
ne-co	49.75	85.37	71.30	25.15	20.40	39.04	73.84	75.00	18.75	26.20
ja-ar	56.73	105.20	41.40	64.98	69.07	103.05	85.71	83.49	.	.
ja-bo	54.76	83.15	34.32	43.38	67.19	85.69	86.59	69.46	35.39	26.95
ja-br	87.81	181.02	50.76	70.85	73.85	143.71	91.21	112.62	82.32	116.14
ja-co	71.05	135.89	45.44	67.03	53.52	90.27	127.22	129.05	86.09	109.46

... to be continued

Table K: ... continued

Country Pair	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
	1991.01-2001.06		**1991.01-1994.11**		**1994.12-1997.06**		**1997.07-1998.12**		**1999.01-2001.06**	
Pacific - Asia										
au-indi	49.54	143.05	75.97	170.06	34.02	56.74	34.14	35.81	17.65	27.65
au-indo	128.60	330.35	20.71	64.40	25.20	81.35	378.55	303.19	102.22	103.30
au-ko	69.86	192.32	22.24	45.87	40.75	96.53	201.49	268.81	44.66	71.30
au-ma	45.39	101.96	-4.20	-2.67	36.90	80.75	73.15	156.25	27.14	36.07
au-ph	40.65	132.52	30.09	61.42	19.80	39.46	59.41	84.11	49.17	107.65
au-ta	32.74	82.52	.	.	26.15	54.58	28.91	36.51	40.96	61.51
au-th	57.40	167.59	27.58	63.00	34.30	71.19	86.71	126.10	42.60	78.11
ne-indi	30.99	29.70	20.52	10.59	14.20	27.50	25.58	23.41	18.75	26.20
ne-indo	149.73	158.21	11.17	13.50	12.30	26.98	369.59	296.34	132.27	102.10
ne-ko	85.21	128.69	12.42	11.87	22.36	44.39	217.65	243.64	36.27	47.80
ne-ma	44.52	60.55	1.12	0.56	17.75	38.04	84.24	137.74	27.54	36.46
ne-ph	37.38	64.68	15.01	15.29	23.78	41.67	72.37	84.39	19.68	32.12
ne-ta	32.65	49.97	.	.	12.21	19.47	44.14	47.43	15.09	18.55
ne-th	62.80	112.88	4.79	4.36	14.01	27.45	106.96	133.27	37.89	55.54
indi-ja	61.65	181.09	70.48	157.70	62.66	113.67	58.54	78.93	34.56	52.44
indo-ja	147.96	382.05	31.23	72.33	65.99	166.67	394.64	388.64	105.45	117.82
ja-ko	89.22	473.02	37.05	155.93	60.68	219.48	220.43	594.95	52.97	184.46
ja-ma	68.53	156.02	19.33	12.46	65.20	142.27	103.27	206.08	48.14	68.96
ja-ph	71.01	242.70	51.22	136.27	83.39	183.55	88.74	128.96	68.77	156.12
ja-ta	42.41	126.09	.	.	38.99	82.59	48.72	78.34	38.07	67.60
ja-th	76.07	221.32	25.82	55.83	61.51	134.05	151.44	249.25	68.03	126.17
Pacific - North America										
au-me	82.53	229.35	42.97	103.79	145.31	261.71	64.84	101.69	29.92	49.19
ne-me	105.27	163.52	21.01	23.78	154.59	277.22	69.22	99.21	47.56	74.26
me-ja	95.58	243.73	43.71	92.89	126.07	226.16	102.99	144.19	56.58	89.41

... to be continued

Table K: ... continued

Country Pair	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
	1991.01-2001.06		**1991.01-1994.11**		**1994.12-1997.06**		**1997.07-1998.12**		**1999.01-2001.06**	
					South America - Asia					
ar-indi	46.09	85.56	62.43	97.52	23.76	42.25	14.35	13.11	.	.
ar-indo	170.03	306.97	15.13	26.45	1.17	2.11	449.97	356.87	.	.
ar-ko	81.91	137.55	17.85	24.91	14.89	22.72	220.21	184.03	.	.
ar-ma	67.54	111.41	4.80	2.82	10.74	14.01	129.11	136.53	.	.
ar-ph	43.58	76.74	25.56	36.66	9.19	12.15	93.48	84.25	.	.
ar-ta	33.12	47.03	.	.	4.71	6.76	54.10	43.65	.	.
ar-th	69.23	125.21	17.47	24.36	2.53	3.21	164.75	155.29	.	.
bo-indi	23.13	34.56	32.98	40.76	33.66	43.09	21.27	15.19	1.46	1.34
bo-indo	167.45	240.17	3.45	4.45	4.57	5.49	459.36	312.31	78.33	58.50
bo-ko	84.71	118.98	7.59	8.50	15.08	17.88	233.66	175.19	12.28	10.28
bo-ma	56.90	79.99	16.84	6.35	17.31	17.03	134.50	106.22	-2.18	-1.44
bo-ph	46.81	68.70	27.20	30.76	12.79	13.09	99.05	74.67	23.46	20.75
bo-th	27.09	34.96	.	.	8.37	8.79	59.22	39.73	6.21	5.06
bo-ta	68.14	98.49	6.36	7.52	7.51	8.04	173.00	139.57	23.64	17.89
br-indi	66.82	145.17	59.55	87.85	28.45	56.94	21.66	24.88	56.72	88.76
br-indo	161.34	311.08	28.81	46.34	7.40	15.83	458.04	409.05	76.51	74.99
br-ko	101.54	187.27	28.82	38.62	20.27	36.19	225.10	231.45	42.62	52.42
br-ma	92.24	162.52	57.88	29.32	14.88	26.33	133.66	187.43	54.97	66.09
br-ph	75.04	145.97	32.04	42.07	7.37	12.10	95.38	102.63	53.51	73.10
br-th	77.84	131.02	.	.	8.41	12.67	58.89	57.30	50.13	57.12
br-ta	84.81	168.89	32.42	44.09	11.10	19.07	168.15	203.84	46.35	62.48
co-indi	54.00	101.32	60.75	89.78	25.95	43.81	63.90	60.50	48.67	58.77
co-indo	162.36	277.11	30.86	47.18	22.40	40.17	471.88	360.87	98.80	84.20
co-ko	80.59	135.89	26.69	34.99	35.48	56.89	215.40	183.27	51.86	57.43
co-ma	63.73	100.46	50.85	28.96	27.17	40.86	135.16	132.02	41.57	44.39
co-ph	47.82	82.54	39.55	52.81	36.03	53.40	90.00	76.58	47.97	56.91
co-th	54.24	86.59	.	.	16.44	18.78	79.10	66.10	53.92	55.32
co-ta	62.97	109.14	30.95	41.85	25.29	39.43	157.65	139.10	41.35	47.64
R^2	0.997		0.945		0.994		0.999		0.991	
R^2_{adj}	0.997		0.944		0.994		0.999		0.991	
s.e.e.	0.003		0.005		0.003		0.005		0.003	

Notes:

1) Table K reports results from estimating equation (1) in section 4 of the main text. The dependent variable is volatility measure 1. For each country pair one border dummy variable is included in the regression equation. The total number of estimated border dummies is 105. Summary results are reported in table 10. There are 10,878 observations. (Exceptions: No Taiwanese data are available for the first subperiod, no Argentinean data are available for the last subperiod). For further notes, see the footnotes of table 2.

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