Public Disclosure Authorized

Public Disclosure Authorized

WPS 1370

POLICY RESEARCH WORKING PAPER

1370

Is East Asia Less Open than North America and the European Economic Community? No

There is more bias toward intra-regional trade in North America and the founding members of the European Union (EEC) than in East Asia. East Asian markets are not closed to trade with outside countries.

Sumana Dhar
Arvind Panagariya

The World Bank
International Economics Department
International Trade Division
October 1994

POLICY RESEARCH WORKING PAPER 1370

Summary findings

To shed light on regional integration schemes in North America and Europe (and on the alleged trading bloc in East Asia), Dhar and Panagariya explore the nature of bilateral trade relationships.

Using the gravity model, they conduct an econometric analysis of trade flows between major trading countries. They estimate bilateral trade flow equations using a data set for 45 countries over 12 years and then use those equations to study the contribution of trading blocs to intra-regional trade.

Past investigators have estimated the gravity equation using data for total trade, pooling data across countries. Dhar and Panagariya estimate separate equations for the exports and imports of 22 countries (nine in East Asia, six in Europe, three in North America, two in South America, and one in Oceania).

Using 27 countries outside of North America, East Asia, and the founding members of the European Union (EEC) as the control countries, Dhar and Panagariya test for each region's openness to trade with outside countries.

They conclude that:

- Results based on individual-country equations differ greatly from those obtained from pooled, cross-country equations. In some cases, this difference is qualitative. Not surprisingly, in virtually all cases the cross-country equation masks large differences among countries. The coefficient associated with distance, for example, varies between –4.4 and –0.4 across the authors' equations. In almost every case the coefficient is statistically significant at a confidence level of 99 percent or more.
- If there is an intra-regional bias in trade, it is more in North America and among the founding members of the European Union than in East Asia. Canada, the United States, and all countries of the EEC show an intra-regional bias in both exports and imports. In East Asia, on the other hand, exports in six out of nine countries have a statistically significant bias *away from* intra-regional markets.
- There is little support for the hypothesis that East Asian markets are closed to trade with outside countries.
- Contrary to conventional wisdom, controlling for other variables, many countries export less to North America than to countries outside the three regions. Similarly, countries outside the EEC export more to the EEC than to countries in the control group.

This paper — a product of the International Trade Division, International Economics Department — is part of a study funded by the Bank's Research Support Budget under the research project "Understanding Bilateral Flows: An Application to East Asia" (RPO 677-86). Copies of this paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Jennifer Ngaine, room R2-054, extension 37959 (39 pages). October 1994.

The Policy Research Working Paper Series disseminates the findings of work in progress to encourage the exchange of ideas about development issues. An objective of the series is to get the findings out quickly, even if the presentations are less than fully polished. The papers carry the names of the authors and should be used and cited accordingly. The findings, interpretations, and conclusions are the authors' own and should not be attributed to the World Bank, its Executive Board of Directors, or any of its member countries.

Produced by the Policy Research Dissemination Center

Is East Asia Less Open than North America and the European Economic Community? No

Sumana Dhar
*Arvind Panagariya**

* Dhar is with the International Trade Division, World Bank, and the Department of Economics, University of North Carolina, Chapel Hill. Panagariya is with the Center for International Economics, Department of Economics, University of Maryland, College Park. The authors thank Paul Armington, Ann Harrison, Lant Pritchett, Maurice Schiff, and Sethaput Suthiwart-Narueput for many helpful suggestions on an earlier draft.

Table of Contents

1. Introduction

Paradoxically, both the revival of regional integration around the world and disintegration of the CMEA and the Soviet Union have led to a renewal of interest in the gravity equation. On the one hand, Krugman (1991), Frankel (1993) and Saxonhouse (1993) have applied the model to study regional biases in international trade while, on the other, Collins and Rodrik (1991), Havrylyshyn and Pritchett (1991), and Wang and Winters (1991) have used it to predict post-reform trade flows of the countries in Eastern Europe and ex-Soviet Union.

Traditional theories of international trade focus almost exclusively on the determinants of a country's exports and imports and do not address the issue of the direction of trade. As such, theories which provide guidance on the determinants of direction of trade are virtually nonexistent.[1] Yet, in the context of regional integration schemes such as the European Economic Community (EEC), European Free Trade Area (EFTA), North American Free Trade Agreement (NAFTA) and the alleged East Asian trading bloc, an understanding of bilateral trade relationships is critical.[2] Not surprisingly, because it forms the basis of econometric analysis of bilateral trade flows, interest in the gravity equation has risen with the interest in regionalism. The equation has yielded consistently better fits than any other empirical relationship in

---

[1] Perhaps the only paper which focuses on this question is the relatively recent paper by Markusen (1986). Markusen constructs a model with three regions - two in the North and one in the South - and neatly combines scale economies, product differentiation, non-homothetic preferences and factor-endowment differences to generate a realistic pattern of trade. For plausible configurations of factor-endowment differences, he shows that the regions in the North must trade in differentiated products with each other and each of them must also export these products to the South in return for homogeneous products. The model also predicts a larger volume of trade between the two capital-abundant Northern regions than between each of them and the South.

[2] Countries of East Asia studied in this paper are listed in Appendix 1.

international trade literature.[3]

The gravity model was pioneered independently by Tinbergen (1962) and Poyhonen (1963) and extended by Linneman (1966). The first two authors postulated that bilateral trade flows are related positively to the GDPs of the trading countries and negatively to the distance between them; the last included populations of the two countries as explanatory variables in the model. Though the broad objective of the original authors was to identify the determinants of bilateral trade flows, subsequent investigators have gone on to employ the model for at least three additional purposes. First, the equation has been employed to test whether preferential trading arrangements including free trade areas (FTAs) and customs unions (CUs) have a statistically significant effect on bilateral trade flows. Second, the equation has been employed to test the Linder hypothesis that trade in manufactures is more intense among rich countries with similar per-capita incomes. Finally, the equation has been used to predict equilibrium trade flows of formerly socialist countries in the post-reform era.

Aitken (1973) was the first one to test for the effects of regional arrangements on trade flows. Introducing dummy variables for trading partners belonging to the same regional grouping (EEC or EFTA), he found statistically significant effects of these arrangements. Later, Thursby and Thursby (1987) and Bergstrand (1985, 1989) also included dummy variables for the EEC and EFTA in their equations but obtained mixed results. More recently, as noted above, Frankel (1992) and Saxonhouse (1993) have used the gravity equation to test whether there is a *de facto* trading bloc in East Asia. The former uses Aitken's equation in a slightly modified form and estimates it for total bilateral trade flows, while the latter introduces factor

[3] For a summary of the empirical literature, see Deardorff (1984).

endowments into the equation and estimates it for several 3-digit SITC commodity groups. Both reject the hypothesis of a trading bloc in East Asia.

The Linder hypothesis has been the main focus of the contributions by, inter alia, Thursby an Thursby (1987), Balassa and Bauwens (1988), and Hanink (1990). All these studies find strong support for the hypothesis that similar rich countries trade more intensively with each other in manufactures than dissimilar ones. The use of the gravity equation for predicting trade flows is of a more recent origin. Demise of the CMEA and the Soviet Union and a move towards more liberal and outward oriented policies has meant that trade flows of these economies will be drastically reoriented. Collins and Rodrik (1991), Havrylyshyn and Pritchett (1991) and Wang and Winters (1991) have all applied gravity equations estimated for market economies to predict trade flows of the countries in Eastern Europe and the ex-Soviet Union in the post-reform equilibrium.

In this paper, we subject the gravity equation to a far more careful and detailed econometric analysis than has been done to-date. We then re-examine the issues of regional trading blocs using the estimated equations.[4] In a companion paper, Dhar and Panagariya (1994), we also examine the issue of prediction of trade flows using the gravity model.[5]

Purely in terms of the quality of estimation, we contribute to the literature in three important ways. First, we work with a much larger data set than done by anyone so far. Second, with the sole exception of Thursby and Thursby (1987), authors have pooled the data

---

[4] For a discussion of various *policy* issues relating to the regional option for East Asia, see Panagariya (1993).

[5] Srinivasan and Canonero (1993) simulate the effects of preferential trading in the context of South Asian countries.

for different countries and gone on to fit the same equation to trade flows of all countries in the sample.[6] Our statistical tests lead to an unequivocal rejection of the hypothesis that the coefficients across countries are identical. Therefore, we estimate the equation separately for each country and present 22 such cases in this paper. Finally, most investigators (e.g., Aitken, Frankel, and Bergsrand) have estimated the equation using total trade rather than exports and imports separately. We test the hypothesis of equality of coefficients for exports and imports for all countries and overwhelmingly reject it. We then estimate separate equations for exports and imports.

These methodological changes lead to a richer set of results than obtained so far. The conclusions drawn from individual country equations are very different from those obtained from traditional pooled, cross-country equations. In virtually all cases, not surprisingly, the cross-country equation masks large differences across countries, even after inclusion of summary measures for variation in policy and size. For example, the coefficient associated with distance varies between -4.4 and -0.44 across equations.

Intra-regional bias in trade is to be found more in North America and the EEC than East Asia. Canada, the U.S.A. and all countries in the EEC show intra-regional bias in exports as well as imports. In East Asia, exports of 6 out of 9 countries have a statistically significant bias *away from* intra-regional markets. We also compare the openness of each of the three regions with a control group of 27 countries outside North America, EEC and East Asia. Our results

---

[6] Thursby and Thursby include several short-run variables such as the exchange-rate variability and prices in the equations. This mixing-up of short run and long run variables inevitably influences their results. In this paper, we follow closely the pure gravity equation as, for example, in Aitken (1973) and Frankel (1992) and include only the long-run variables.

do not support the hypothesis that East Asian markets are closed to outside countries. *Ceteris paribus*, for countries outside the EEC, exports to the EEC are larger than to countries in the control group. Most surprisingly and contrary to the conventional wisdom, controlling for other variables, exports to North America are less than to countries outside the three regions for all EEC countries and Australia!

The paper is organized as follows. In Section 2, we discuss the basic gravity equation and its rationale and report diagnostic tests performed to arrive at particular form(s) in which we estimate it. In Section 3, we estimate the equation for a group of 22 countries and discuss its implications. In Section 4, we make concluding remarks.

2. Rationale and Diagnostic Tests

Gravitational force between two bodies is directly proportional to the mass of those bodies and inversely proportional to the distance between them. By analogy, the gravity equation postulates that bilateral trade flows are directly proportional to the mass of the two nations (represented by their GDPs) and inversely proportional to the distance between them. This basic relationship is often augmented by inclusion of other variables such as per-capita GDPs of the two countries, a dummy variable for a common border and other dummy variables to represent memberships in different regional arrangements.[7] Because a key issue we wish to address concerns the presence of regional trading blocs in Europe, North America, and East

[7] Rationale for the inclusion of price and exchange rate variables by Thursby and Thursby (1987) and Bergstrand (1985, 1989) is derived from essentially partial equilibrium models. Bergstrand lays out a general equilibrium model but then chooses not to solve for equilibrium prices. As illustrated in Anderson (1979) and Markusen (1986), once we solve for prices, only income or endowments variables should appear in the equation. This is particularly true if we are interested in the determinants of long-run trade flows.

Asia, we can represent this relationship by

$$\ln T_j^i = \beta_0 + \beta_1 \ln(DISTANCE_j^i) + \beta_2 (BORDER_j^i) + \beta_3 \ln(GDP^i)$$
$$+ \beta_4 \ln (GDP_j) + \beta_5 \ln(PCGDP^i) + \beta_6 \ln(PCGDP_j) + \beta_7(EC6_j^i)$$
(1)
$$+ \beta_8(NA_j^i) + \beta_9(EA_j^i) + u_j^i$$
$$i = 1,...n_I,\ j = 1,...n_J;\ \ i \neq j;\ \ n_I \leq n_J.$$

where superscript i denotes the reporter country, j the partner country, n_I the total number of reporter countries in the sample and n_J the total number of partner countries. Traditionally, this equation is estimated in natural logarithms of the variables. T_j^i stands for either the value of exports from country i to country j or the value of imports into country i from country j or the sum of the two (i.e., total value of trade between i and j). In the discussion below, we frequently refer to i as the reporter country and to j as the partner country.

$DISTANCE_j^i$ denotes the distance between countries i and j and GDP^i and $PCGDP^i$ the total and per-capita gross domestic product of country i, respectively. $BORDER_j^i$ and the last three variables are dummy variables. The former equals 1 if i and j have a common border but 0 otherwise. $EC6_j^i$ takes a value of 1 if i and j are both in the EEC but 0 otherwise. NA_j^i and EA_j^i have a similar interpretation where the former stands for North America and the latter for East Asia.[8]

Equation (1) does not have a strong theoretical foundation and the reasoning behind the

[8] Unless otherwise noted, EEC (EC6) includes the original six members, NA comprises Canada, USA and Mexico, and EA is defined to cover the ten countries in East Asia listed in Appendix 1.

explanatory variables is largely intuitive.[9] Distance is expected to have a negative coefficient because transport costs rise and access to information may decline as distance rises. Controlling for distance, adjacency (BORDER) is expected to contribute positively to trade because of possibilities of border trade and cultural and linguistic ties which may not be picked up by distance. This effect is not entirely unambiguous, however; if there is hostility between neighboring nations, the effect may be the opposite. Controlling for per-capita GDP, GDPs are thought to have a positive effect on the absolute level of trade and this can be shown with the help of a multi-country, multi-good Ricardian model (Anderson 1979). It is possible (though not plausible), however, for the reporter country's GDP to have a negative effect on the **value** of its trade. For example, in the Heckscher-Ohlin model, if all factors expand proportionately in the reporter country, the latter's per-capita GDP remains unaffected while the GDP rises. If the elasticity of foreign demand for the country's exports is sufficiently low, even though the **quantities** of exports and imports rise, their **value** may decline.[10] Per-capita incomes are generally hypothesized to have a positive effect on trade because, controlling for the GDP, the higher the per-capita income the greater the demand for differentiated products and the greater the degree of specialization in production. Here again, the argument is not watertight. According to the Linder hypothesis, trade expands with a reduction in differences in per-capita incomes. This suggests opposite signs for per-capita incomes of the two countries.[11] The last

---

[9] *Ex post* rationalizations of the gravity equation include Anderson (1979) and Bergstrand (1985, 1989).

[10] For more on this, see Thursby and Thursby (1987) and Bergstrand (1985, 1989).

[11] Thursby and Thursby (1987) postulate it by the absolute difference in per-capita incomes of reporter and partner countries.

three dummy variables test for possible regional bias and are expected to have positive signs.

Frankel (1993) is the main author who uses the traditional gravity equation to address the issue of an East Asian trading bloc. The equation he employs is slightly different from ours. To wit, he estimates the equation in the form

$$\ln T_j^i = \alpha_0 + \alpha_1 \ln(\text{DISTANCE}_j^i) + \alpha_2(\text{BORDER}_j^i) + \alpha_3 \ln(\text{GDP}^i.\text{GDP}_j) + \alpha_4 \ln(\text{PCGDP}^i.\text{PCGDP}_j) + \alpha_5(\text{EC6}_j^i) + \alpha_6(\text{NA}_j^i) + \alpha_7(\text{EA}_j^i) + u_j^i \quad (1')$$

In effect, Frankel restricts equation (1) such that coefficients associated with the reporter- and partner-country GDPs and those associated with the two per-capita GDPs are identical. Since theory does not give a clear guidance on the signs of the reporter-country GDP and per-capita GDP and our tests do not support the hypothesis of equality of coefficients between the two GDPs and per-capita GDPs, we have chosen to report the results using the more flexible form in (1).

Our data set includes annual data on 45 countries listed in Appendix 1 for years 1980-92. The sample includes all the OECD countries, and all the countries with significant amount of trade in East Asia, South Asia, and Latin America. We excluded the countries in Africa primarily because the quality of data in that region is significantly poorer than elsewhere and because the distance variable in that region does not capture the same factors as elsewhere due to poor accessibility in general. We also excluded the countries in Eastern Europe and the Soviet Union. Because the observed data for 1992 was incomplete at the time of writing, we used it only to compare against the predictions from our estimated equations for that year (Dhar and Panagariya, 1994).

We subject the data to three diagnostic tests. First, we tested for heteroskedasticity. We rejected the hypothesis of no heteroskedasticity with the probability of 99.99% in all our tests. Therefore, we applied the Huber-White correction to all our coefficients and test statistics.

Second, we formally tested the hypothesis of equality of coefficients across countries. Equation (1) is traditionally estimated by pooling the data for all reporter countries for one or more years. This amounts to the restriction that exports of, say, Venezuela, follow the same relationship as exports of U.S.A. Because this seemed unlikely to us, we chose to test formally the hypothesis that the coefficients in equation (1) are identical across countries.[12]

Because the test is slightly tricky, it is useful to spell it out explicitly. The country equation equivalent to (1) takes the form

$$\begin{aligned} \ln T_{jt}^{i} = {} & \beta_0^i + \beta_1^i \ln(\text{DISTANCE}_j^i) + \beta_2^i (\text{BORDER}_j^i) + \beta_3^i \ln(\text{GDP}_t^i) \\ & + \beta_4^i \ln(\text{GDP}_{jt}) + \beta_5^i \ln(\text{PCGDP}_{jt}) + \beta_6^i (\text{EC6}_{jt}^i) \\ & + \beta_7^i (\text{NA}_j^i) + \beta_8^i (\text{EA}_{jt}^i) + u_{jt}^i \end{aligned} \tag{2}$$

$$j = 1,..n_j,\ t = 1980,...1991;\ \ i \neq j.$$

The coefficients, distinguished by superscript i, are now country specific. The time subscript is denoted by t.[13] In a country equation, there being only one reporter, the cross-country

---

[12] At the minimum, one must control for country-specific fixed effects. If this is not done, the regional dummies in (1) and (1') are likely to pick up country-specific effects rather than the pure "regional" effect.

[13] We can fix t to any particular year and still estimate (2) using 44 observations for a given i. Allowing t to vary increases the degrees of freedom.

source of variation is absent.[14] Because the correlation coefficient between the reporter GDP and per-capita income for most of the 22 countries for which we estimated the equations exceeded 0.9, we have dropped $PCGDP^i$ as an explanatory variable in (2).

Returning to the test for pooling, recall that as defined, regional dummies take a value of 1 if both the reporter and partner belong to the same region and 0 otherwise. Therefore, for a given estimated equation, if the reporter (country i) does not belong to any of the three regions, the last three variables are equal to zero. If i belongs to one of the regions, two of the three dummy variables still take a value of zero.

These observations imply that in testing the hypothesis of equality of coefficients across reporting countries, we must include the coefficient associated with a regional dummy only when comparing two countries in the same region. In all other cases, the regional dummy should be excluded because either the dummy does not enter the equation (as in the case of countries not belonging to any region) or the regional dummies in the two equations are different (as when they belong to different regions).

To limit the number of cases, we chose to apply the test to exports from a total of 22 countries to 44 partner countries.[15] The reporter countries include 9 countries from East Asia (minus China), 3 from North America, 5 from the EEC (Belgium and Luxembourg appear as one in the data) and 5 outside these regions.[16] Even then, limiting the test to exports alone,

---

[14] In pooled cross-country data there is sufficient variation in population across countries to rule out multicollinearity between the GDP and per-capita GDP.

[15] Countries listed in Appendix 1 are the 45 partners in trade.

[16] Focus on the issue of regional bias in trade made us include the major players in the three regions. If regional effects prevail, they must exist in the original members of the EEC and the major countries in East Asia and North America. Unfortunately, China was dropped from the

we have 231 pairs of countries to compare. We rejected the null hypothesis of the equality of coefficients across countries in every one of these cases with 99.99% probability. Indeed, in the majority of the cases, the much stronger hypothesis of equality of individual coefficients was rejected with a 90% or higher probability.

Our final diagnostic test was with respect to the equality of coefficients across exports and imports of a given country. We carried out this test for the 22 countries mentioned earlier and rejected the null hypothesis that coefficients in the export and import equations are equal with a probability of 99.99% in each case.

3. Estimation

Based on our diagnostic tests, we estimate separate export and import equations, without $PCGDP^i$, for each of the 22 countries using the Huber-White correction. For purposes of comparison, we also estimate the gravity equation by pooling data from these same 22 reporter countries. The latter is presented at the bottom of Tables 1, 2 and 3. For brevity, we discuss only the equations for exports in detail. Import equations are discussed only when the results are different from those of export equations. Both export and import equations are presented at the end of the paper.

3.1 The Basic Equation

We begin by estimating (2) in the simplest form, dropping all regional dummy variables (Table 1A). Measured by both the adjusted R^2 and root mean square error (MSE), on the average, country-specific equations give better fits than the pooled equation. For exports, in 16

---

list due to unavailability of data over the entire sample period. For comparison purposes, we also included two countries in Latin America, one in South Asia, one in Europe and Australia in our sample.

out of 22 cases, the country-specific equation does better on the basis of both the adjusted R^2 or root MSE. In two additional cases, it does better on the basis of one of the two criteria. Countries for which the adjusted R^2 is lower and/or root MSE is higher than in the pooled equation are Argentina, Mexico, Indonesia, Korea, Taiwan (China) and Singapore. Fits for fast-growing countries of East Asia, particularly Korea and Singapore, and for Argentina and Mexico are consistently poor. A large proportion of the variation in exports and imports of these countries is not explained by the limited number of explanatory variables used in our regressions. Remarkably, fits for India are very good suggesting perhaps that though the controls may have influenced the level of trade, the direction of trade was determined by conventional variables.

Perhaps the most striking point is that for countries in the EEC and Japan, the adjusted R^2 lies between 0.83 and 0.91. Thus, for these countries, both imports and exports are largely explained by the small number of variables included in our equation. Room for any regional variables to add to the explanatory power is limited. One is almost tempted to reject the hypothesis of major regional effects in these countries and terminate investigation at this point. But this is perhaps hasty and unscientific.

Turning to individual coefficients, **DISTANCE** has a negative and statistically significant coefficient (at 99% level) in 37 out of 44 cases.[17] This is not surprising in view of what is already known from gravity equations estimated using pooled data. What is surprising is that,

[17] Canada and U.S.A. are the only countries where the coefficient has a positive sign in both export and import equations. But later, after we control for all regional effects (Tables 3A), the coefficient of distance in all cases except Korea becomes positive and statistically significant. The fit for Korea has been consistently poor with adjusted R^2 lying between 0.28 and 0.5.

unlike the impression conveyed in the literature on the basis of pooled gravity equation (e.g., Anderson, 1979), the value of the coefficient varies considerably across individual countries and differs from -1 (in most cases, even statistically significantly). For exports, the coefficient ranges from -0.5 for Great Britain to -3.5 for Indonesia. In the pooled equations shown at the bottom of Table 1A, the coefficient does turn out to be close to -1, with extremely high t-ratios.

Next, consider the coefficient of **BORDER**. A common conclusion from the pooled gravity equation is that, controlling for distance, the presence of a common border contributes positively to trade. This is borne out by both of our pooled equations. The coefficient is 0.35 for the export equation with t-ratios in excess of 3. But, as in the case of DISTANCE, the common coefficient for all countries in the pooled equation hides substantial cross-country differences.[18] Indeed, when estimated at the level of the country, in some cases, even the sign of the coefficient switches. For example, in the case of India, as one will expect on the basis of hostility between her and China and Pakistan, the coefficient is negative in both the export and import equation. For reasons that are not entirely clear, a common border also contributes negatively to the exports of Mexico, Thailand, Indonesia and Malaysia. For the latter two countries, imports are also negatively related to common border. When positive, the actual size of the coefficient varies considerably across countries. The coefficient is much smaller for the EEC countries and has high t-ratios. This may be because trade with countries that have a common border but do not belong to the EEC is not so intense.

$\mathbf{GDP_j}$ or the partner country GDP has a positive impact (with very strong t-ratios) on

[18] Australia, Japan, Korea, Taiwan and the Philippines do not have a common border with any of the 45 countries in our data set.

both bilateral exports and imports of all countries considered. In the pooled equation for both exports and imports, the coefficient has a value around 0.85. In country-specific equations the coefficient varies between 1.4 and 0.5. Except for exports of Argentina and Mexico, $PCGDP_j$, the per capita GDP of the partner country also has a positive and, in most cases, a statistically significant effect on trade. This is consistent with the usual results from pooled regressions.

As noted before, GDP^i, the reporter-country GDP, switches signs quite frequently across countries when $PCGDP^i$, the reporter per-capita GDP, is also included in the equation. As our results show, this problem is alleviated considerably once we drop per-capita GDP from the equation. Only for Canada's exports does this variable have a negative and statistically significant coefficient. In more than half of the cases -- 26 out of 44 -- the sign is positive and highly significant. This sign is far more stable than in Thursby and Thursby (1987).

3.2 Introducing Regional Dummies: Is East Asia different?

In **Table 2A,** we introduce the first set of dummies aimed at capturing regional effects (equation 2). The question under investigation is whether East Asia exhibits significantly different intra-regional characteristics from other countries trading within their own region. EC6, EA and NA take the value of 1 when both the reporter and partner in a bilateral trade relation belong to the EEC, East Asia and North America, respectively. If one or both partners do not belong to these regions, the value is 0. For Argentina, Australia, Brazil, Great Britain and India, estimated equations remain the same as in Table 1A. For other countries, we have one extra variable.

A critical issue in introducing the regional dummy is possible multicollinearity between it and BORDER. We checked the correlation between these two variables for each individual

country and the group of 22 as a whole. For the cross-section of 22 countries, correlations between BORDER on the one hand and EC6, EA and NA on the other are 0.34, 0.06 and 0.23, respectively. For countries in North America, the correlation is 0.7 or more. In the case of the United States, the two variables become identical. In the EEC, with the exception of Italy, the correlation lies between 0.57 and 0.86. At the country level, the correlation is low only in East Asia. There the correlation coefficient is 0.3 or lower (except for Malaysia where it is 0.53). This implies that we cannot include both the regional dummy and BORDER as explanatory variables, except in the cross-section equations, Italy and the countries in East Asia region.

We estimated (2) both with and without the BORDER dummy. We found that differences in results even for countries with low correlation between this variable and the relevant regional dummy, in terms of the adjusted R^2 and MSE were minimal.[19] Only equations for Argentina and Brazil show a noticeable fall in explanatory power when BORDER is dropped from the equation. Broadly, the importance of a common border diminishes once we control for the common region.

For ease of comparison, we choose to present the results when BORDER is dropped as an explanatory variable from all equations including the cross-section equation. The estimated coefficients are shown in Table 2A.[20] Because the general sign pattern of the coefficients of the original variables (included in Table 1A) does not change dramatically, in the following, we

---

[19] In the cross-section equation, we found that the coefficient of the EC6 dummy was negative and statistically insignificant when BORDER was included as an explanatory variable. Curiously, in the country equations, EC6 has consistently positive and statistically significant coefficient irrespective of whether BORDER is included or not.

[20] The estimates, corresponding to Table 2 and 3, where the estimator includes BORDER as a dummy variable, are available from the authors.

limit the discussion primarily to regional dummies.

According to pooled equations, location of both the reporter and partner in East Asia and EEC have a positive and statistically significant effect on exports and imports. For North America, the positive effect is statistically significant only for imports. Coefficients for East Asia are considerably larger in absolute value than those for North America or the EEC. For exports the value is 0.74 compared to 0.15 for EEC and 0.14 for NA (statistically insignificant). In the case of intra-regional imports the coefficient is 1.28 for East Asia, 0.36 for EEC and 0.34 for NA. These results lend some support to claims of intra-regional bias in East Asia and an absence of such a bias in North American trade.

The intra-regional bias shown in the cross-section equations is similar to that obtained by Frankel (1993) for total trade.[21] He finds the coefficients for the East Asian block as the strongest and most significant at 1.84 and for the EEC at 0.4. The size of the coefficient for Western Hemisphere is close to that for EEC and much smaller than that for East Asia.[22] The high significance of dummies for especially open countries like Singapore and Hong Kong and a dummy where at least one of the partners is located in East Asia, when introduced along with the regional dummy for East Asia, provides evidence of the general openness of this region. However, one needs to compare this openness to trade with that of other regions. Frankel also

---

[21] The dummy variables in Frankel's analysis are comparable, though he uses different geographical aggregates except for the EEC. His pooled equations are based on a larger number of countries. The sample also differs because he uses the average of total trade over a three-year period as the dependent variable, whereas we are working with annual export and import data spanning over a 12-year period.

[22] As in the export equation in Table 2, the NA coefficient is also insignificant in Frankel's estimation. He overcomes it by extending that regional block to include the Latin American countries.

does not analyze the trading relations between the more-developed and less-developed partners within East Asia, except for the case of Japan. We find that the pattern can be better analyzed when the trade flow is disaggregated into country-specific exports and imports and through the dummy variables defined in the next section.

The picture alters dramatically when we estimate the equation at the level of the country. For the **EEC**, both for exports and imports, location of the partner in the same region has a positive and statistically significant effect. The magnitude of the coefficient is uniformly larger than that in the corresponding pooled equation and comparable to the coefficients on which we based the claim of intra-regional bias in East Asian trade. These results contradict the common belief that the coefficient in a pooled equation is a weighted average (with positive weights, of course) of corresponding coefficients estimated from unpooled samples. Based on the pooled equation, we will accept the hypothesis of low intra-regional bias in EEC trade, specially exports. Individual country equations lead us to exactly the opposite conclusion.

For countries in **East Asia**, differences between results obtained from cross-section and country equations are even more stark. In the country equations, the regional dummy tells a different story for exports and imports.[23] In the export equation, the dummy is positive and statistically significant for only three (Japan, Korea and Taiwan (China)) out of nine countries. For the remaining six, the coefficient is negative and, in five cases, statistically significant at

[23] Note that there is no contradiction between a positive intra-regional bias in exports and a negative bias in imports or vice versa. Because trade is not balanced bilaterally, controlling for other variables, Japan may export more to its East Asian partners than to outside countries but import less from them than the latter. Also, a positive bias in intra-regional exports of one country need not imply a positive bias in imports of another country. Indeed, in the absence of balanced trade, it is even possible for all countries to have intra-regional bias in exports but not in imports or vice versa.

95% or higher level of confidence. These results contradict the positive, large and statistically highly significant coefficient of EA in the cross-section equation. On the import side, the story from the pooled equation holds on the average. Broadly, the bias is larger for the more developed economies of the region - Japan, Korea and Taiwan (China).

In **North America** the story is similar to that in the EEC for the developed countries but not for Mexico. The regional effect as captured by the NA dummy is quite large and statistically highly significant in both export and import equations of the U.S.A. and Canada. In both cases the coefficients are far larger than those in the pooled equations. In the case of Mexico for which fits have been generally poor, the coefficient of NA in the export equation remains stubbornly negative.

To summarize, the results so far suggest an intra-regional bias in both exports and imports in the EEC and North America. Contrary to popular claims, the bias is weaker in East Asia than in the EEC and North America. On the export side, 6 out of 9 countries show a negative bias which is statistically significant. On the import side, the positive bias being also present in the EEC and North America, is not peculiar to East Asia.

3.3 Introducing the "Other Region" Effects

So far, we have allowed for trade effects which are purely intra-regional. We did not control for the bias arising from the location of a partner in another bloc, for example, the effects on the exports of a North American country due to the location of a partner in the EEC or East Asia. It may be argued that if East Asia or the EEC is a closed bloc, ceteris paribus, the United States will be able to export less to countries in this region than to countries not belonging to any bloc. Controlling for this bias, we can also compare intra-regional bias with

extra-regional bias. For example, we can consider the possibility that North America may be more open than other regions to all countries or that East Asia may be closed to outside countries. To capture such effects, we now introduce dummies for the three regions. Formally, our equation now takes the form

$$\begin{aligned} \ln T_{jt}^{i} = {} & \beta_0^i + \beta_1^i \ln(\text{DISTANCE}_j^i) + \beta_2^i (\text{BORDER}_j^i) + \beta_3^i \ln(\text{GDP}^i) \\ & + \beta_4^i \ln(\text{GDP}_j) + \beta_5^i \ln(\text{PCGDP}_j) + \beta_6^i (\text{EC6P}_j^i) \\ & + \beta_7^i (\text{NAP}_j^i) + \beta_8^i (\text{EAP}_j^i) + u_{jt}^i \end{aligned} \qquad (2')$$

$$j = 1,\ldots n_j,\ t = 1980,\ldots 1991;\ \ i \neq j.$$

where we add a "P" at the end of the symbol for each regional dummy to distinguish it from the corresponding dummy variable in (1). EC6P, EAP and NAP take the value of 1 when a country's trade partner belongs to the EEC, East Asia and North America, respectively. If the partner does not belong to the region, the value is 0. Note that the interpretation of the coefficients of these dummy variables is different depending on whether the reporter also belongs to a given region or not. When the reporter is in the same region, the dummy coincides with that in the previous subsection and captures intra-regional effects. If the reporter country is outside the region, the dummy measures the general openness of the region. For example, in an East Asian country's equation, EAP measures intra-regional bias but in a North American country's equation, it measures openness to outside countries. If intra-regional bias is present, for a country located in East Asia, the coefficient of EAP dummy will be positive. If East Asia is more open than other countries, the coefficient of EAP in equations of countries outside East

Asia will be positive.

As before, we estimated (2') both with and without the BORDER dummy and finding no consistent favorite, discuss the latter in **Table 3A**.

The first point to note is that compared with Table 2A, the adjusted R^2 in country-specific equations is consistently higher in Table 3A. This means that the addition of partner dummies increases the explanatory power of the model. Though the Table 1A is not strictly comparable to Tables 2A and 3A, due to the exclusion of BORDER, one can note the steady enhancement of the explanatory power of the model from the fall in root MSE of the pooled equations. Because the results of the dummies capturing intra-regional effects (i.e., the reporter lies in the region represented by the dummy) remain qualitatively unchanged, in the following, we focus on dummies capturing the effects of outside regions (i.e., when the reporter does not lie in the region represented by the dummy).

Consider first the export equation. For countries outside East Asia, with the sole exception of Mexico, EAP has a positive and statistically significant coefficient at well above 99% level of confidence. For countries outside the EEC, the same holds true for EC6P except in the case of Japan and Singapore. For Japan, the coefficient is positive and statistically significant at 95% level of confidence while for Singapore, it is negative and statistically insignificant. For countries outside North America, the coefficient of NAP shows more ambiguity. For four out of five countries in the EEC, NAP has a negative and statistically significant coefficient at 99% level of confidence. The same also holds true for Australia, though not for countries in East Asia. In the latter case, the coefficient is positive and statistically significant at 99% level of confidence for seven out of nine countries and negative

and statistically insignificant for the remaining two countries. In sum, controlling for other variables, countries export more to East Asia and the EEC than to countries outside the three regions represented in equation (2'). Countries in the EEC export less to North America than to countries outside the three regions in the sample.

A closer examination of Table 3A reveals that for four out of five countries in the EEC, the coefficient of EAP is larger than that of EC6P. In other words, relative to countries outside the three regions, the bias in exports in favor of East Asia is larger than the intra-regional bias! This also holds true for Canada. For U.S.A., the coefficient for EAP (1.32) is virtually the same as for NAP (1.37), implying that the bias in favor of East Asia is not much less than intra-regional bias. For the majority of countries in East Asia, the bias is the largest in favor of the EEC. For Japan and Korea the intra-regional bias and for Taiwan (China) the bias in favor of North America predominates, when compared with exports to countries outside the three regions.

In the import equations we see some evidence supporting the hypothesis of a bias against imports from North America. Oddly, the evidence points not at Japan or much of East Asia but at the EEC. Relative to countries outside the three regions, there is a favorable bias for North America but it is less than the intra-regional bias. The region that has most to complain against Japan and Korea is the EEC whose coefficient is negative.[24]

To conclude, for countries in the EEC, on the whole, the bias in both exports and imports is positive when the partner is in the EEC or East Asia while it is negative when the

[24] Dhar and Panagariya 1994b presents a detailed discussion on the trade relations between Japan and USA.

partner is in North America. In the export equation, except in the case of Italy, the coefficient of EAP is consistently larger than that of EC6P, contradicting loudly the hypothesis that East Asian markets are closed to outside countries. Oddly enough, it is in the case of North America that exports show a negative and statistically significant bias for four of the five countries in the EEC.

4. Conclusion

Our findings can be summarized as follows. First, not surprisingly, the results based on individual country equations are very different from those obtained from pooled, cross-country equations. In some cases, the results are qualitatively different. A good example is the coefficient associated with distance, which shows that bilateral trade does not respond uniformly to the proximity of nations. In cross-country equations, our results are broadly in conformity with the view of Anderson (1979) and others, that this coefficient is approximately equal to -1.[25] Yet, in individual-country equations, it ranges from -4.4 (Thailand, Table 2A) and -0.44 (Great Britain, Table 1B). In virtually all cases the coefficient is statistically significant at 99% or higher level of confidence.

Second, if there is intra-regional bias in trade, it is to be found more in North America and the EEC than East Asia. This result, from country-specific equations, is broadly consistent with that reached by Frankel (1993) from the pooled cross-country equation. All countries in the EEC show intra-regional bias in exports as well as imports. The same holds true for the United States and Canada. For 6 out of 9 countries in East Asia, exports have a statistically

[25] In five out of six cross-country equations estimated by us, the coefficient lies between -0.89 and -0.99. In the remaining case, it is -0.75.

significant bias *away from* intra-regional markets.

Third, we are able to go another step beyond Frankel by testing for the openness of each region to outside countries. Out of the 45 countries in our sample, those outside North America, EEC and East Asia, serve as the control countries. The openness of each of the three regions can be compared with this control group. Our results do not support the hypothesis that East Asian markets are closed to outside countries. For example, in the export equation of U.S.A., controlling for other variables, exports to East Asia are larger than to countries in the control group. This conclusion holds true for all countries except Mexico.

Finally, in the same vein, we can consider the openness of the EEC and North America. We find that, *ceteris paribus*, for countries outside the EEC, exports to the EEC are larger than to countries in the control group (i.e., outside the three regions). For example, controlling for other variables, exports of Indonesia to EEC countries are larger than to countries in the control group. Most surprisingly and contrary to the conventional wisdom, for many countries, exports to North America are less than to countries outside the three regions! This is true for all EEC countries and Australia.

References

Aitken, N.D., 1973, "The Effect of the EEC and EFTA on European Trade: A Temporal Cross-Section Analysis," American Economic Review, Vol. 63, No. 55, pp. 881-92.

Anderson, James E., 1979, "A Theoretical Foundation for the Gravity Equation," American Economic Review Vol. 69, March, pp. 106-116.

Balassa, Bela and L. Bauwens, Changing Trade Patterns in Manufactured Goods: An Econometric Investigation, Elsevier Science Publishers, Netherlands, 1988

Bergstrand, Jeffrey H., 1989, "The Generalized Gravity Equation, Monopolistic Competition, and the Factor Proportions Theory in International Trade," Review of Economics and Statistics, pp. 143-153.

Bergstrand, Jeffrey H., 1985, "The Gravity Equation in International Trade: Some Microeconomic Foundations and Empirical Evidence," The Review of Economics and Statistics, Vol. 67, August, pp. 474-481.

Collins, Susan M. and Dani Rodrik, 1991, Eastern Europe and the Soviet Union in the World Economy, pp. 1-69, Institute for International Economics, Washington D.C.

Deardorff, Alan V., 1984, "Testing Trade Theories and Predicting Trade Flows", in R.W. Jones and P.B. Kenen (eds.) Handbook of International Economics, Volume I, pp. 467-517, Amsterdam: North-Holland Publishing Co.

Dhar, Sumana and Arvind Panagariya, 1994, "Predictions of Bilateral Trade and the Gravity Equation", work in progress, International Trade Division, World Bank, Washington, D.C.

Foroutan, Faezeh and Lant Pritchett, 1991, "Intra-Sub-Saharan African Trade: Is It Too Little?" Journal of African Economies (forthcoming).

Frankel, Jeffery A., 1993, "Is Japan Creating a Yen Bloc in East Asia and the Pacific?," in J.A. Frankel and M. Kahler (eds.) Regionalism and Rivalry: Japan and the United States in Pacific Asia, Chicago: University of Chicago Press for NBER, pp. 53-87.

Hanink, Dean M., 1990, "Linder, Again", Weltwirtschaftliches Archiv, Vol. 126, No. 2, pp. 257-267.

Havrylyshyn, O. and L. Pritchett, 1991, "European Trade Patterns After the Transition," PRE Working Paper Series 748, The World Bank, Washington, D.C.

Krugman, Paul, 1991, "The Move Toward Free Trade Zones", in Policy Implications of Trade

and Currency Zones, Federal Reserve Bank of Kansas, Jackson Hole, Wyoming, August.

Linder, Steffan B., 1961, An Essay on Trade and Transformation, New York.

Linnemann, Hans, 1966, An Econometric Study of International Trade Flows, Amsterdam: North-Holland Publishing Co.

Markusen, James R., 1986, "Explaining the Volume of Trade: An Eclectic Approach," American Economic Review, Vol. 76, December, pp. 1002-1011.

Panagariya, Arvind, 1994, "East Asia: A New Trading Bloc?", Finance and Development, Vol. 31, No.1, March, Washington D.C.

Panagariya, Arvind, 1993, "Should East Asia Go Regional? No, No and Maybe", WPS 1209, October, Policy Research Dept., The World Bank, Washington D.C.

Poyhonen, P., 1963, "A Tentative Model for the Volume of Trade between Countries", Weltwirtschaftliches Archiv, Vol. 90, No. 1, pp. 93-100.

Saxonhouse, Gary R., 1992, "Pricing Strategies and Trading Blocs in East Asia," in J.A. Frankel and M. Kahler (eds.) Regionalism and Rivalry: Japan and the United States in Pacific Asia, Chicago: University of Chicago Press for NBER, pp. 89-124.

Saxonhouse, Gary R., 1993, "Trading Blocks and East Asia", in J. de Melo and A. Panagariya (eds.) New Dimensions in Regional Integration, The World Bank, Washington D.C.

Srinivasan, T.N. and Gustavo Canonero, 1993, "Preferential Trade Arrangements: Estimating the Effects on South Asian Countries", mimeo, The World Bank, Washington D.C.

Tinbergen, Jan, 1962, Shaping the World Economy: Suggestions for International Economic Policy, New York.

Thursby, Jerry G., and Marie C. Thursby, 1987, "Bilateral Trade Flows, the Linder Hypothesis, and the Exchange Risk," The Review of Economics and Statistics, August, pp. 488-495.

Wang, Z.K. and L. Alan Winters, "The Trading Potential of Eastern Europe," 1991, mimeo, Department of Economics, University of Birmingham, Birmingham.

APPENDIX 1

The Countries are organized in alphabetic order of acronymns according to Region

	NAME	CODE	ACRONYM	REGION
1	CHINA	156	CHN	EA
2	JAPAN	392	JPN	EA
3	INDONESIA	360	IDN	EA - ASEAN4
4	MALAYSIA	458	MYS	EA - ASEAN4
5	PHILIPPINES	608	PHL	EA - ASEAN4
6	THAILAND	764	THA	EA - ASEAN4
7	HONG KONG	344	HKG	EA - NIC
8	KOREA, RP	410	KOR	EA - NIC
9	TAIWAN (CHINA)	8961	OAN	EA - NIC
10	SINGAPORE	702	SGP	EA - NIC
11	BELGIUM-LUXEMBOURG	56	BLX	EC6
12	GERMANY, FR	280	DEU	EC6
13	FRANCE	250	FRA	EC6
14	ITALY	380	ITA	EC6
15	NETHERLANDS	528	NLD	EC6
16	CANADA	124	CAN	NA
17	MEXICO	484	MEX	NA
18	USA	840	USA	NA
CONTROL				
19	DENMARK	208	DNK	EC9
20	UNITED KINGDOM	826	GBR	EC9
21	IRELAND	372	IRL	EC9
22	SPAIN	724	ESP	EC12
23	GREECE	300	GRC	EC12
24	PORTUGAL	620	PRT	EC12
25	AUSTRIA	40	AUT	EU
26	SWITZERLAND	756	CHE	EU
27	FINLAND	246	FIN	EU
28	NORWAY	578	NOR	EU
29	SWEDEN	752	SWE	EU
30	TURKEY	792	TUR	EU
31	ARGENTINA	32	ARG	LA
32	BOLIVIA	68	BOL	LA
33	BRAZIL	76	BRA	LA
34	CHILE	152	CHL	LA
35	COLOMBIA	170	COL	LA
36	PERU	604	PER	LA
37	PARAGUAY	600	PRY	LA
38	URUGUAY	858	URY	LA
39	VENEZUELA	862	VEN	LA
40	AUSTRALIA	36	AUS	OCN
41	NEW ZEALAND	554	NZL	OCN
42	BANGLADESH	50	BGD	SA
43	INDIA	356	IND	SA
44	SRI LANKA	144	LKA	SA
45	PAKISTAN	586	PAK	SA

APPENDIX 2

Years: 1980-1992 with the provision to expand to 1958-1968 for the comparison with EC.

Trade: X^i_j (M^i_j) - Average annual US dollar value of exports (imports) between each reporter and partner for 1980-1992 from the COMTRADE database of UN Statistical Organization, Geneva.

GDP: GDP^i, GDP_j - GDP in US dollar of the reporter and partner for 1980-1992.

GDP per capita: $PCGDP^i$, $PCGDP_j$ - GDP per capita in US dollar of the reporter and partner for 1980-1992.

- Nominal GDP from the National Accounts database of the World Bank which uses the Atlas Method. (Atlas Method - The data at current prices are converted from the local currency to US dollars using a conversion factor other than the official for each year, when the official exchange rate is greatly distorted.) Populations of the reporter and partner for 1980-1992 from the IEC Social and Demographic Indicators database were then used to obtain the nominal GDP per capita

- Real GDP per capita from the Summers Heston (1992) database for 1980-1988. Populations of the reporter and partner for 1980-1988 from the same database were then used to obtain the real GDP.

Size: $area^i$ - Land area of the reporter in '000 sq. km. from the IEC Social and Demographic Indicators database.

Distance: d^i_j - The straight-line distance between major ports of entry of reporter and partner from Linneman (1966).

BORDER: b^i_j - Dummy = 1 if the countries i and j share a common border, 0 otherwise.

Regional Arrangements: EC6, EA, NA - Dummy = 1 if both reporter and partner are members of a regional block, 0 otherwise.

EC6P, EAP, NAP - Dummy = 1 if partner is a member of a regional block, 0 otherwise.

TABLE 1A: GRAVITY MODEL OF BILATERAL TRADE BEFORE THE INTRODUCTION OF REGIONAL DUMMIES**

LHS VARIABLE: LOG OF TOTAL EXPORTS *

REPORTER COUNTRY (I)	CONST	LGDP I	LGDP J	LPCGDP J	LDIST	BORDER	ADJ R2	RT MSE
Countries in EA								
HONG KONG	1.073	0.061	0.614	0.648	-0.884	1.766	0.69	1.165
	0.45	0.43	13.33	15.10	-14.12	5.69		
INDONESIA	-24.421	1.835	1.401	0.636	-3.504	-3.829	0.75	1.871
	-2.14	2.91	20.34	7.62	-26.76	-14.00		
JAPAN	8.164	0.114	0.695	0.279	-1.308	0	0.85	0.617
	5.69	1.79	26.51	12.36	-31.81			
KOREA	-13.726	0.740	0.396	0.577	-0.033	0	0.28	2.128
	-3.60	4.16	4.19	5.13	-0.14			
MALAYSIA	-4.862	0.666	1.124	0.198	-2.095	-1.943	0.81	1.122
	-1.23	2.88	27.88	5.24	-29.71	-5.63		
TAIWAN (CHINA)	-10.562	0.821	0.323	0.819	-0.627	0	0.37	1.980
	-3.23	4.98	3.29	7.53	-3.76			
PHILIPPINES	15.881	-0.883	1.044	0.697	-1.865	0	0.73	1.538
	1.83	-1.76	18.07	10.79	-18.80			
SINGAPORE	-6.793	0.305	0.925	0.357	-0.809	1.959	0.35	2.493
	-1.08	0.95	14.26	4.40	-2.09	1.21		
THAILAND	-9.139	1.094	1.068	0.716	-2.942	-0.454	0.76	1.584
	-2.95	6.22	22.92	13.63	-27.38	-2.27		
Countries in NA								
CANADA	-2.415	-0.250	0.965	0.004	0.228	2.526	0.82	0.745
	-0.92	-2.03	34.28	0.16	2.20	11.88		
MEXICO	18.289	-0.263	1.232	-0.119	-2.865	-1.161	0.52	2.142
	2.31	-0.66	19.24	-1.90	-14.44	-3.75		
USA	-0.276	-0.069	0.750	0.133	0.171	2.003	0.75	0.736
	-0.09	-0.52	31.48	4.07	1.59	11.53		

TABLE 1A: CONTINUED

REPORTER COUNTRY (i)	CONST	LGDP I	LGDP j	LPCGDP j	LDIST	BORDER	ADJ R2	RT MSE
Countries in EC6								
BELGIUM-LUX	-2.925	0.327	0.785	0.063	-0.706	0.546	0.86	0.741
	-1.53	3.13	25.94	1.69	-20.51	6.08		
WEST GERMANY	-2.687	0.359	0.724	0.149	-0.622	0.264	0.91	0.537
	-1.55	4.27	35.78	5.78	-20.78	3.55		
FRANCE	-2.068	0.316	0.722	0.092	-0.639	0.551	0.91	0.534
	-1.33	4.06	35.53	3.62	-21.68	8.76		
ITALY	-3.347	0.334	0.757	0.279	-0.789	-0.336	0.89	0.597
	-2.43	5.22	34.98	10.98	-17.34	-3.10		
NETHERLANDS	3.723	0.083	0.653	0.157	-0.742	0.714	0.87	0.687
	1.92	0.80	26.67	5.62	-27.43	10.45		
Countries outside regional groups								
ARGENTINA	-5.912	0.487	0.868	-0.116	-0.844	1.739	0.46	1.423
	-2.06	3.44	19.05	-2.14	-6.65	5.68		
AUSTRALIA	15.673	0.024	1.270	0.214	-3.350	0	0.74	1.327
	3.44	0.10	24.39	4.88	-24.55			
BRAZIL	2.204	0.095	0.792	0.065	-0.809	1.152	0.69	0.815
	0.84	0.73	27.57	1.90	-7.77	6.72		
GREAT BRITAIN	0.023	0.187	0.642	0.261	-0.516	1.443	0.76	0.859
	0.01	1.45	22.88	6.84	-13.22	15.30		
INDIA	-0.122	0.622	0.848	0.708	-2.648	-0.871	0.80	1.031
	-0.02	2.27	23.33	14.70	-32.98	-2.67		

** Variables with prefix `L' are in log form. All others are dummy variables.*
Sample period is 1980-91. No. of obvs. (N) is 527, except PHL 439, DEU and IND 484.
t-ratios are given below the coefficients.

** *N = 11419*								
POOLED	-12.379	0.831	0.837	0.174	-0.987	0.349	0.59	1.781
EQUATION	-27.64	72.22	55.60	9.58	-29.89	3.72		

SOURCE: UN COMTRADE Database

TABLE 1B: GRAVITY MODEL OF BILATERAL TRADE BEFORE THE INTRODUCTION OF REGIONAL DUMMIES**

LHS VARIABLE: LOG OF TOTAL IMPORTS *

REPORTER COUNTRY (I)	CONST	LGDP I	LGDP J	LPCGDP J	LDIST	BORDER	ADJ R2	RT MSE
Countries in EA								
HONG KONG	-5.486	0.472	0.935	0.598	-1.574	0.913	0.76	1.347
	-1.96	2.81	17.24	10.70	-22.06	3.99		
INDONESIA	-22.229	1.207	1.342	0.672	-2.255	-1.875	0.75	1.600
	-2.22	2.21	24.69	14.45	-20.28	-7.51		
JAPAN	2.743	0.250	0.858	0.145	-1.293	0	0.77	0.861
	1.37	2.80	30.72	4.01	-19.84			
KOREA	-16.656	0.594	0.627	0.762	-0.082	0	0.39	2.280
	-4.13	3.12	6.71	7.06	-0.35			
MALAYSIA	-8.686	0.697	0.954	0.476	-1.644	-0.478	0.59	1.547
	-1.61	2.19	20.73	11.30	-15.56	-1.49		
TAIWAN (CHINA)	-14.281	0.732	0.512	0.874	-0.513	0	0.42	2.090
	-4.08	4.03	5.43	8.03	-3.10			
PHILIPPINES	-9.121	0.450	1.116	0.855	-1.930	0	0.66	2.033
	-0.82	0.69	19.91	10.43	-18.02			
SINGAPORE	-10.290	0.310	1.005	0.600	-0.840	2.373	0.45	2.377
	-1.73	1.03	16.68	8.25	-2.30	1.55		
THAILAND	-6.534	0.550	1.203	0.631	-2.281	0.436	0.77	1.455
	-2.06	3.24	21.37	13.57	-21.07	2.79		
Countries in NA								
CANADA	-13.782	0.333	0.877	0.298	0.107	1.977	0.78	0.910
	-4.19	2.00	24.75	8.80	0.85	7.84		
MEXICO	-26.801	1.385	0.821	0.383	-0.867	1.422	0.46	2.024
	-3.57	3.68	17.62	7.61	-4.25	5.20		
USA	-15.556	0.428	0.829	0.144	0.508	2.471	0.71	0.880
	-4.18	2.52	28.25	3.73	3.53	11.06		

TABLE 1B: CONTINUED

REPORTER COUNTRY (I)	CONST	LGDP I	LGDP J	LPCGDP J	LDIST	BORDER	ADJ R2	RT MSE
Countries in EC6								
BELGIUM-LUX	-4.399	0.383	0.663	0.188	-0.489	1.165	0.90	0.559
	-0.20	5.01	31.16	8.67	-19.81	12.30		
WEST GERMANY	-3.105	0.322	0.671	0.270	-0.489	0.228	0.86	0.658
	-1.52	3.18	29.64	8.26	-13.50	2.88		
FRANCE	-4.829	0.370	0.693	0.237	-0.494	0.522	0.91	0.521
	-3.20	5.23	42.52	10.26	-19.23	6.63		
ITALY	-2.148	0.255	0.754	0.213	-0.653	-0.166	0.88	0.601
	-1.51	3.86	35.09	10.63	-18.04	-1.61		
NETHERLANDS	-2.811	0.226	0.689	0.235	-0.395	1.219	0.83	0.735
	-1.38	2.10	27.62	7.72	-12.53	13.68		
Countries outside regional groups								
ARGENTINA	-5.183	-0.120	0.740	0.693	-0.278	4.173	0.53	1.788
	-1.49	-0.68	13.47	10.26	-1.40	9.17		
AUSTRALIA	10.809	-0.087	1.124	0.583	-2.575	0	0.70	1.401
	2.38	-0.37	21.53	14.78	-19.73			
BRAZIL	-4.425	0.378	1.005	0.312	-1.507	1.490	0.58	1.560
	-1.01	1.72	17.92	4.07	-8.96	4.79		
GREAT BRITAIN	-3.621	0.265	0.670	0.398	-0.445	1.174	0.75	0.957
	-1.26	1.77	21.25	12.36	-11.75	12.83		
INDIA	-1.028	0.091	1.302	0.514	-2.087	-1.251	0.73	1.460
	-0.13	0.23	20.69	7.63	-12.66	-4.73		

** Variables with prefix `L' are in log form. All others are dummy variables.*
Sample period is 1980-91. No. of obvs. is 527, except IND 439, PHL and DEU 484.
The t-ratios are given below the coefficients.

** *N = 11419*								
POOLED	-14.738	0.829	0.867	0.321	-0.910	0.326	0.64	1.803
EQUATION	-32.87	70.19	58.42	17.84	-28.18	3.40		

SOURCE: UN COMTRADE Database

TABLE 2A: GRAVITY MODEL OF BILATERAL TRADE

DUMMIES: REPORTER AND PARTNER COUNTRIES ARE BOTH IN THE REGION **

WITHOUT DUMMY FOR COMMON BORDER

LHS VARIABLE: LOG OF TOTAL EXPORTS *

REPORTER COUNTRY (I)	CONST	LGDP I	LGDP J	LPCGDP J	LDIST	EC6	EA	NA	ADJ R2	RT MSE
Countries in EA										
HONG KONG	4.293	0.046	0.651	0.633	-1.271	0	-0.835	0	0.68	1.178
	1.64	0.32	14.20	13.88	-10.25		-3.17			
INDONESIA	-25.084	1.819	1.455	0.596	-3.458	0	-0.701	0	0.73	1.932
	-2.17	2.83	22.32	7.26	-16.77		-2.15			
JAPAN	3.574	0.115	0.718	0.251	-0.830	0	0.927	0	0.86	0.587
	2.42	1.93	28.55	12.58	-13.25		8.08			
KOREA	-25.209	0.742	0.476	0.480	1.141	0	2.816	0	0.33	2.048
	-4.98	4.34	5.68	4.79	2.56		4.95			
MALAYSIA	-7.554	0.665	1.160	0.161	-1.822	0	-0.306	0	0.79	1.173
	-1.80	0.74	27.87	4.18	-19.91		-1.70			
TAIWAN (CHINA)	-14.593	0.834	0.335	0.774	-0.191	0	1.068	0	0.38	1.971
	-3.67	5.07	3.48	7.57	-0.66		2.57			
PHILIPPINES	16.393	-0.889	1.045	0.701	-1.915	0	-0.118	0	0.73	1.539
	1.85	-1.77	18.09	10.82	-9.30		-0.31			
SINGAPORE	-1.732	0.274	0.919	0.424	-1.363	0	-0.960	0	0.35	2.490
	-0.31	0.86	12.42	4.76	-6.71		-2.96			
THAILAND	4.145	1.007	1.110	0.826	-4.410	0	-2.958	0	0.80	1.455
	1.28	5.89	25.74	16.63	-24.16		-11.83			
Countries in NA										
CANADA	0.118	-0.250	0.993	-0.035	-0.099	0	0	0.859	0.80	0.782
	0.04	-1.90	36.12	-1.15	-0.93			3.48		
MEXICO	17.857	-0.260	1.211	-0.104	-2.792	0	0	-0.490	0.52	2.145
	2.26	-0.65	19.77	-1.68	-14.96			-1.98		
USA	-0.276	-0.069	0.750	0.133	0.171	0	0	2.004	0.75	0.736
	-0.09	-0.52	31.48	4.07	1.59			11.53		

TABLE 2A: CONTINUED

REPORTER COUNTRY (I)	CONST	LGDP I	LGDP J	LPCGDP J	LDIST	EC6	EA	NA	ADJ R2	RT MSE
Countries in EC6										
BELGIUM-LUX	-3.034	0.337	0.768	0.0681	-0.685	0.699	0	0	0.87	0.731
	-1.61	3.25	24.75	1.85	-21.78	9.42				
WEST GERMANY	-2.472	0.365	0.711	0.156	-0.639	0.314	0	0	0.91	0.535
	-1.44	4.35	33.99	5.94	-24.24	4.60				
FRANCE	-1.882	0.313	0.727	0.093	-0.662	0.463	0	0	0.91	0.541
	-1.20	3.98	35.35	3.56	-21.95	6.48				
ITALY	-4.317	0.357	0.728	0.272	-0.691	0.663	0	0	0.90	0.577
	-3.34	5.84	34.80	10.78	-21.18	10.88				
NETHERLANDS	3.592	0.099	0.627	0.164	-0.713	0.734	0	0	0.88	0.678
	1.871	0.950	24.286	5.916	-26.861	9.740				
Countries outside regional groups										
ARGENTINA	0.223	0.524	0.858	-0.184	-1.513	0	0	0	0.44	1.452
	0.08	3.62	17.95	-3.55	-21.75					
AUSTRALIA	15.673	0.024	1.270	0.214	-3.350	0	0	0	0.74	1.327
	3.44	0.10	24.39	4.88	-24.55					
BRAZIL	6.979	0.173	0.759	-0.005	-1.373	0	0	0	0.65	0.859
	2.60	1.28	23.97	-0.17	-19.49					
GREAT BRITAIN	0.695	0.219	0.614	0.251	-0.600	0	0	0	0.75	0.880
	0.27	1.66	21.41	6.48	-14.79					
INDIA	-0.389	0.584	0.802	0.802	-2.529	0	0	0	0.80	1.043
	-0.07	2.10	24.43	18.84	-24.06					

** Variables with prefix `L' are in log form. All others are dummy variables.*
Sample period is 1980-91. No. of obvs. (N) is 527, except PHL 439, DEU & IND 484
t-ratios are given below the coefficients.

*** N = 11419*

POOLED	-13.615	0.864	0.825	0.200	-0.918	0.153	0.740	0.143	0.59	1.774
EQUATION	-36.16	77.66	53.28	11.49	-37.26	2.02	10.55	1.73		

SOURCE: UN COMTRADE Database

TABLE 2B: GRAVITY MODEL OF BILATERAL TRADE

DUMMIES: REPORTER AND PARTNER COUNTRIES ARE BOTH IN THE REGION **

WITHOUT DUMMY FOR COMMON BORDER

LHS VARIABLE: LOG OF TOTAL IMPORTS *

REPORTER COUNTRY (i)	CONST	LGDP I	LGDP J	LPCGDP J	LDIST	EC6	EA	NA	ADJ R2	RT MSE
Countries in EA										
HONG KONG	-6.456	0.478	0.967	0.552	-1.498	0	0.295	0	0.76	1.351
	-2.13	2.82	19.56	10.14	-11.65		1.08			
INDONESIA	-26.874	1.251	1.336	0.638	-1.786	0	0.675	0	0.75	1.611
	-2.66	2.29	23.38	13.55	-10.14		2.79			
JAPAN	-4.581	0.253	0.894	0.099	-0.531	0	1.479	0	0.80	0.806
	-2.11	3.01	32.42	2.29	-4.17		7.25			
KOREA	-34.812	0.597	0.754	0.609	1.774	0	4.452	0	0.49	2.087
	-7.23	3.38	9.33	6.59	4.35		8.28			
MALAYSIA	-12.993	0.744	0.911	0.474	-1.171	0	1.160	0	0.67	1.520
	-2.45	2.40	18.75	12.22	-11.25		7.44			
TAIWAN (CHINA)	-24.915	0.766	0.542	0.756	0.638	0	2.818	0	0.46	2.018
	-6.24	4.34	5.97	7.43	2.27		6.98			
PHILIPPINES	-15.726	0.517	1.114	0.811	-1.286	0	1.541	0	0.66	2.014
	-1.41	0.80	19.60	10.62	-5.80		3.48			
SINGAPORE	-7.745	0.299	0.953	0.684	-1.081	0	0.122	0	0.45	2.391
	-1.47	0.98	13.58	8.02	-5.28		0.40			
THAILAND	-1.237	0.519	1.210	0.680	-2.860	0	-1.065	0	0.78	1.438
	-0.37	3.07	21.59	14.30	-13.82		-4.02			
Countries in NA										
CANADA	-13.448	0.328	0.874	0.311	0.075	0	0	1.497	0.78	0.901
	-4.17	1.98	25.56	9.49	0.68			8.54		
MEXICO	-26.601	1.387	0.834	0.367	-0.905	0	0	0.895	0.46	2.025
	-3.55	3.68	18.50	7.44	-4.59			4.20		
USA	-15.556	0.428	0.830	0.145	0.509	0	0	2.472	0.71	0.880
	-4.18	2.52	28.25	3.73	3.55			11.06		

TABLE 2B: CONTINUED

REPORTER COUNTRY (I)	CONST	LGDP I	LGDP J	LPCGDP J	LDIST	EC6	EA	NA	ADJ R2	RT MSE
Countries in EC6										
BELGIUM-LUX	-4.222	0.397	0.650	0.1804	-0.506	1.029	0	0	0.90	0.556
	-3.08	5.20	29.58	8.32	-21.13	11.91				
WEST GERMANY	-3.213	0.330	0.647	0.287	-0.459	0.600	0	0	0.86	0.645
	-1.61	3.30	27.07	8.65	-15.05	9.00				
FRANCE	-5.067	0.372	0.685	0.249	-0.460	0.804	0	0	0.92	0.505
	-3.46	5.39	42.03	10.82	-18.53	12.44				
ITALY	-3.291	0.298	0.705	0.201	-0.513	1.172	0	0	0.91	0.522
	-2.70	5.16	35.27	10.83	-25.84	21.30				
NETHERLANDS	-2.362	0.241	0.677	0.220	-0.442	0.559	0	0	0.82	0.754
	-1.130	2.174	25.143	7.323	-13.824	5.297				
Countries outside regional groups										
ARGENTINA	9.537	-0.031	0.714	0.530	-1.882	0	0	0	0.46	1.920
	2.69	-0.17	10.96	8.14	-17.97					
AUSTRALIA	10.809	-0.087	1.124	0.583	-2.575	0	0	0	0.70	1.401
	2.38	-0.37	21.53	14.78	-19.73					
BRAZIL	1.749	0.479	0.962	0.220	-2.238	0	0	0	0.56	1.598
	0.40	2.12	16.77	3.02	-21.50					
GREAT BRITAIN	-3.075	0.291	0.648	0.390	-0.513	0	0	0	0.75	0.969
	-1.05	1.92	20.46	11.99	-13.35					
INDIA	-1.405	0.036	1.235	0.650	-1.916	0	0	0	0.73	1.476
	-0.18	0.09	20.61	10.55	-11.90					

** Variables with prefix 'L' are in log form. All others are dummy variables.*
Sample period is 1980-91. No. of obvs. (N) is 527, except IND 439, PHL & DEU 484.
The t-ratios are given below the coefficients.

** *N = 11419*										
POOLED	-17.193	0.886	0.843	0.365	-0.751	0.362	1.283	0.343	0.62	1.780
EQUATION	-44.71	77.39	55.30	21.26	-30.65	4.79	19.52	3.70		

SOURCE: UN COMTRADE Database

TABLE 3A: GRAVITY MODEL OF BILATERAL TRADE
DUMMIES: ONLY PARTNER COUNTRY IS IN THE REGION**

WITHOUT DUMMY FOR COMMON BORDER

LHS VARIABLE: LOG OF TOTAL EXPORTS *

REPORTER COUNTRY (I)	CONST	LGDP I	LGDP J	LPCGDP J	LDIST	EC6P	EAP	NAP	ADJ R2	RT MSE
Countries in EA										
HONG KONG	4.910	0.109	0.561	0.627	-1.294	0.670	-0.727	0.679	0.69	1.161
	1.90	0.77	10.43	14.12	-10.65	4.34	-2.93	2.84		
INDONESIA	-26.994	2.066	1.296	0.569	-3.440	1.333	-0.391	1.178	0.74	1.894
	-2.38	3.27	17.41	7.10	-16.48	5.68	-1.22	5.51		
JAPAN	3.531	0.139	0.677	0.245	-0.803	0.192	1.010	0.387	0.86	0.582
	2.40	2.37	24.35	12.44	-12.39	1.86	8.49	3.26		
KOREA	-24.272	0.802	0.345	0.484	1.151	0.423	3.033	1.568	0.35	2.023
	-4.88	4.73	3.55	4.77	2.58	2.77	5.20	5.11		
MALAYSIA	-8.319	0.742	1.119	0.134	-1.790	0.767	-0.164	-0.130	0.80	1.152
	-2.02	3.10	22.20	3.62	-19.59	4.03	-0.88	-0.72		
TAIWAN (CHINA)	-12.792	0.937	0.130	0.767	-0.215	1.132	1.356	1.987	0.41	1.915
	-3.38	5.77	1.22	7.56	-0.76	7.84	3.19	6.47		
PHILIPPINES	14.150	-0.602	0.907	0.671	-1.942	1.306	0.090	0.858	0.75	1.498
	1.65	-1.23	12.72	10.66	-9.44	5.93	0.25	3.29		
SINGAPORE	-1.903	0.266	0.936	0.419	-1.357	-0.003	-0.977	-0.241	0.35	2.494
	-0.35	0.82	10.97	4.66	-6.67	-0.02	-2.87	-1.32		
THAILAND	3.800	1.109	1.007	0.782	-4.350	1.316	-2.667	0.330	0.81	1.412
	1.22	6.74	19.09	16.63	-24.51	5.81	-10.94	1.27		
Countries in NA										
CANADA	4.645	-0.159	0.899	-0.044	-0.653	0.187	0.985	0.722	0.84	0.702
	1.96	-1.37	33.43	-1.54	-5.52	1.64	12.67	3.58		
MEXICO	16.455	-0.231	1.195	-0.138	-2.628	0.439	-0.360	-0.295	0.52	2.139
	2.10	-0.58	16.50	-1.85	-15.63	2.66	-0.98	-1.05		
USA	5.533	0.055	0.638	0.109	-0.604	0.471	1.315	1.368	0.84	0.586
	2.27	0.53	27.86	4.07	-6.10	5.33	17.51	9.28		

TABLE 3A: CONTINUED

REPORTER COUNTRY (I)	CONST	LGDP I	LGDP J	LPCGDP J	LDIST	EC6P	EAP	NAP	ADJ R2	RT MSE
Countries in EC6										
BELGIUM-LUX	-1.926	0.346	0.762	0.060	-0.839	0.494	0.801	-0.381	0.89	0.656
	-1.15	3.75	20.95	1.75	-29.13	6.38	8.65	-3.40		
WEST GERMANY	-1.706	0.364	0.715	0.151	-0.749	0.176	0.599	-0.374	0.93	0.470
	-1.15	5.02	32.98	6.99	-26.31	2.43	9.72	-4.09		
FRANCE	-0.825	0.339	0.699	0.084	-0.807	0.319	0.660	-0.008	0.92	0.487
	-0.60	4.91	31.41	3.85	-27.95	4.80	9.47	-0.11		
ITALY	-4.012	0.347	0.737	0.283	-0.716	0.625	0.305	-0.328	0.91	0.557
	-3.24	5.85	29.50	12.17	-20.38	9.32	4.06	-3.77		
NETHERLANDS	4.579	0.102	0.627	0.158	-0.855	0.525	0.739	-0.442	0.90	0.603
	2.71	1.11	22.73	5.87	-26.76	6.41	9.94	-4.08		
Countries outside regional groups										
ARGENTINA	1.934	0.622	0.700	-0.190	-1.628	1.657	0.796	0.856	0.50	1.368
	0.79	4.57	11.94	-3.73	-17.90	8.59	4.75	4.25		
AUSTRALIA	10.440	0.135	1.201	0.179	-2.860	1.055	0.917	-0.514	0.77	1.251
	2.44	0.60	18.73	4.32	-25.07	6.65	7.58	-2.56		
BRAZIL	10.311	0.219	0.688	0.016	-1.772	0.826	1.071	0.441	0.72	0.765
	4.34	1.86	18.97	0.55	-17.94	8.06	10.23	4.19		
GREAT BRITAIN	1.620	0.272	0.557	0.242	-0.738	0.199	0.790	0.164	0.78	0.836
	0.66	2.14	14.62	5.60	-11.53	1.99	6.44	0.99		
INDIA	-2.740	0.783	0.615	0.838	-2.387	1.116	0.883	1.074	0.83	0.961
	-0.54	3.04	14.62	20.81	-21.05	7.30	6.83	5.65		

** Variables with prefix 'L' are in log form. All others are dummy variables.*
Sample period is 1980-91. No. of obvs. (N) is 527, except PHL 439, DEU & IND 484.
t-ratios are given below the coefficients.

*** N = 11419*										
POOLED	-11.286	0.833	0.733	0.220	-0.973	0.722	0.859	0.466	0.60	1.747
EQUATION	-27.77	73.55	42.44	12.40	-39.65	17.13	20.62	8.24		

SOURCE: UN COMTRADE Database

TABLE 3B: GRAVITY MODEL OF BILATERAL TRADE
DUMMIES: ONLY PARTNER COUNTRY IS IN THE REGION**
WITHOUT DUMMY FOR COMMON BORDER

LHS VARIABLE: LOG OF TOTAL IMPORTS *

REPORTER COUNTRY (I)	CONST	LGDP I	LGDP J	LPCGDP J	LDIST	EC6P	EAP	NAP	ADJ R2	RT MSE
Countries in EA										
HONG KONG	-6.322	0.494	0.964	0.532	-1.527	0.605	0.254	-0.533	0.77	1.331
	-2.12	2.88	15.08	9.84	-11.92	4.13	0.91	-3.06		
INDONESIA	-27.421	1.272	1.338	0.623	-1.762	0.280	0.715	-0.301	0.75	1.609
	-2.70	2.31	20.52	13.17	-9.94	1.58	2.95	-1.80		
JAPAN	-5.658	0.258	0.879	0.100	-0.397	-0.299	1.681	0.589	0.81	0.788
	-2.61	3.09	28.74	2.93	-2.99	-3.73	7.80	5.35		
KOREA	-34.804	0.618	0.692	0.620	1.833	-0.199	4.641	1.178	0.50	2.070
	-7.31	3.51	7.19	6.58	4.48	-1.35	8.35	4.79		
MALAYSIA	-13.532	0.810	0.871	0.456	-1.150	0.568	1.276	0.051	0.67	1.515
	-2.54	2.56	15.08	11.45	-11.06	3.58	7.43	0.21		
TAIWAN (CHINA)	-23.859	0.826	0.417	0.755	0.629	0.579	3.004	1.328	0.47	1.999
	-6.11	4.66	3.98	7.34	2.25	4.25	7.09	5.55		
PHILIPPINES	-16.714	0.649	1.048	0.796	-1.300	0.639	1.639	0.393	0.67	2.009
	-1.49	0.99	14.71	10.27	-5.77	2.96	3.74	1.52		
SINGAPORE	-8.220	0.276	1.001	0.671	-1.064	-0.009	0.072	-0.671	0.45	2.390
	-1.56	0.90	12.37	7.87	-5.16	-0.07	0.23	-3.67		
THAILAND	-1.367	0.513	1.220	0.677	-2.852	0.003	-1.069	-0.156	0.78	1.440
	-0.40	3.01	18.59	14.08	-13.76	0.02	-3.93	-0.90		
Countries in NA										
CANADA	-6.982	0.418	0.775	0.303	-0.700	-0.084	1.283	1.159	0.84	0.773
	-2.46	2.87	23.18	11.37	-7.26	-1.06	15.46	7.56		
MEXICO	-29.247	1.429	0.820	0.309	-0.603	0.628	-0.686	1.174	0.47	1.999
	-4.04	3.85	14.47	4.84	-3.49	4.64	-1.97	4.69		
USA	-6.354	0.558	0.711	0.117	-0.667	0.185	1.854	1.339	0.86	0.621
	-2.33	4.54	25.00	4.07	-6.10	2.51	23.61	7.71		

TABLE 3B: CONTINUED

REPORTER COUNTRY (I)	CONST	LGDP I	LGDP J	LPCGDP J	LDIST	EC6P	EAP	NAP	ADJ R2	RT MSE
Countries in EC6										
BELGIUM-LUX	-4.094	0.373	0.678	0.185	-0.537	0.902	0.228	-0.514	0.91	0.533
	-3.09	5.08	29.11	8.71	-20.71	10.65	3.53	-4.58		
WEST GERMANY	-2.174	0.314	0.671	0.284	-0.615	0.364	0.881	-0.790	0.92	0.497
	-1.41	4.07	33.24	11.58	-22.12	5.31	13.73	-8.40		
FRANCE	-3.992	0.391	0.665	0.243	-0.609	0.638	0.698	-0.139	0.94	0.432
	-3.20	6.57	42.45	13.76	-22.13	10.19	12.69	-1.57		
ITALY	-3.660	0.259	0.757	0.214	-0.495	1.054	0.072	-0.751	0.92	0.491
	-3.26	4.71	34.54	11.85	-19.64	17.73	1.22	-7.06		
NETHERLANDS	-0.515	0.298	0.625	0.198	-0.700	0.324	1.228	-0.027	0.89	0.610
	-0.30	3.21	22.32	9.61	-23.71	3.90	17.86	-0.20		
Countries outside regional groups										
ARGENTINA	10.001	0.067	0.565	0.505	-1.836	1.215	0.179	1.040	0.47	1.891
	2.80	0.35	7.21	7.90	-17.18	6.80	0.69	4.16		
AUSTRALIA	3.689	-0.019	1.079	0.562	-1.841	0.393	1.124	-0.479	0.73	1.347
	0.83	-0.08	16.71	13.99	-12.76	2.56	8.25	-2.41		
BRAZIL	7.547	0.510	0.870	0.281	-2.898	0.529	1.672	1.161	0.61	1.493
	1.78	2.34	15.71	4.24	-18.23	4.40	7.74	6.76		
GREAT BRITAIN	-1.594	0.327	0.616	0.376	-0.730	0.005	1.098	-0.221	0.79	0.879
	-0.63	2.27	16.16	10.36	-12.13	0.05	9.20	-1.38		
INDIA	-3.534	0.089	1.169	0.679	-1.704	0.402	0.839	-0.022	0.74	1.447
	-0.46	0.22	15.44	10.62	-10.79	1.66	5.60	-0.10		

** Variables with prefix 'L' are in log form. All others are dummy variables.*
Sample period is 1980-91. No. of obvs. (N) is 527, except IND 439, PHL & DEU 484.
t-ratios are given below the coefficients.

*** N = 11419*										
POOLED	-14.267	0.829	0.786	0.390	-0.890	0.387	0.999	0.267	0.62	1.763
EQUATION	-35.35	72.56	46.43	22.40	-36.64	10.07	22.62	5.56		

SOURCE: UN COMTRADE Database

Policy Research Working Paper Series

	Title	Author	Date	Contact for paper
WPS1344	Which Foreign Investors Worry About Foreign Exchange Risk in South Asia and Why?	Eric Bond Antonio Estache	August 1994	A. Estache 81442
WPS1345	The Decentralization of Public Services: Lessons from the Theory of the Firm	Jacques Cremer Antonio Estache Paul Seabright	August 1994	A. Estache 81442
WPS1346	Linking Competition and Trade Policies in Central and Eastern European Countries	Bernard M. Hoekman Petros C. Mavroidis	August 1994	F. Hatab 35835
WPS1347	Antitrust-Based Remedies and Dumping in International Trade	Bernard M. Hoekman Petros C. Mavroidis	August 1994	F. Hatab 35835
WPS1348	Quality Change and Other Influences on Measures of Export Prices of Manufactured Goods	Robert E. Lipsey	August 1994	J. Ngaine 37947
WPS1349	The New Regionalism and the Threat of Protectionism	Andrew Hughes Hallett Carlos A. Primo Braga	August 1994	A. Kim 33715
WPS1350	Economic Parameters of Deforestation	Joachim von Amsberg	August 1994	E. Schaper 33457
WPS1351	NAFTA's Implications for East Asian Exports	Carlos A. Primo Braga Raed Safadi Alexander Yeats	August 1994	A. Kim 33715
WPS1352	Trade and Growth in Ecuador: A Partial Equilibrium View	Jesko Hentschel	August 1994	D. Jenkins 37890
WPS1353	Nontariff Measures and Developing Countries: Has the Uruguay Round Leveled the Playing Field?	Patrick Low Alexander Yeats	August 1994	J. Jacobson 33710
WPS1354	The Effects of Fiscal Consolidation in the OECD	Warwick J. McKibbin	September 1994	J. Queen 33740
WPS1355	Export Incentives: The Impact of Recent Policy Changes	Sanjay Kathuria	September 1994	M. Haddad 32160
WPS1356	Central Bank Independence: A Critical View	Ignacio Mas	September 1994	T. Lucas 30704
WPS1357	Does Participation Improve Project Performance? Establishing Causality with Subjective Data	Jonathan Isham Deepa Narayan Lant Pritchett	September 1994	M. Geller 32724

Policy Research Working Paper Series

	Title	Author	Date	Contact for paper
WPS1358	Patterns of Behavior in Biodiversity Preservation	Andrew Metrick Martin L. Weitzman	September 1994	A. Marañon 39074
WPS1359	When Method Matters: Toward a Resolution of the Debate about Bangladesh's Poverty Measures	Martin Ravallion Binayak Sen	September 1994	P. Cook 33902
WPS1360	Are Portfolio Flows to Emerging Markets Complementary or Competitive?	Sudarshan Gooptu	September 1994	R. Vo 31047
WPS1361	External Shocks and Performance Responses during Systemic Transition: The Case of Ukraine	F. Desmond McCarthy Chandrashekar Pant Kangbin Zheng Giovanni Zanalda	September 1994	M. Divino 33739
WPS1362	Regulation, Institutions, and Commitment: The Jamaican Telecommunications Sector	Pablo T. Spiller Cezley I. Sampson	October 1994	B. Moore 38526
WPS1363	Brazil's Sugarcane Sector: A Case of Lost Opportunity	Brent Borrell José R. Bianco Malcolm D. Bale	October 1994	M. Bale 31913
WPS1364	Why Do Some Economies Adjust More Successfully Than Others? Lessons from Seven African Countries	Ishrat Husain	October 1994	J. Schwartz 32250
WPS1365	The Macroeconomics of Adjustment in Sub-Saharan African Countries: Results and Lessons	Ishrat Husain	October 1994	J. Schwartz 32250
WPS1366	Distributive Concerns When Replacing a Pay-As-You-Go System with a Fully Funded System	Salvador Valdés-Prieto	October 1994	E. Khine 37471
WPS1367	The Economics of Cash Shortage	Patrick Conway	October 1994	L. Suki 33974
WPS1368	Sustained Inflation in Response to Price Liberalization	Patrick Conway	October 1994	L. Suki 33974
WPS1369	Economic Policy Reform, Government Debt Guarantees, and Financial Bailouts	Philip L. Brock	October 1994	P. Sintim-Aboagye 38526
WPS1370	Is East Asia Less Open than North America and the European Economic Community? No	Sumana Dhar Arvind Panagariya	October 1994	J. Ngaine 37959