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VOLUME 12

REGIONAL ECONOMIC INTEGRATION

MICHELE FRATIANNI
Editor

REGIONAL ECONOMIC INTEGRATION

RESEARCH IN GLOBAL STRATEGIC MANAGEMENT

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CHAPTER 1

INTRODUCTION AND SUMMARY OF CONCLUSIONS

Michele Fratianni

For much of the academic, business and policy communities, today's economic environment is best described by the concept of globalization. Literally, globalization implies that transactions among residents of distant countries are just as likely and intense as transactions among residents of neighboring countries or among residents of communities located inside a country. The facts, instead, are that consumption has a strong domestic bias and that multinational corporations do not have a global reach, but rather focus their activities within an area surrounding the home market. These facts suggest that regionalization and not globalization is the appropriate characterization of today's economic environment. This volume intends to reduce the gap between the perception and reality of globalization.

1. TRADE, BORDERS, AND DISTANCE

Two fundamental reasons that account for the domestic bias of consumption are distance and borders. Distance proxies for unobservable trading costs, which include, among other things, transport and administrative costs. Distance is a powerful deterrent to international trade. This fact is illustrated by considering the situation of Bahrain and Qatar, Belgium and India, and Indonesia and Guyana, which are, respectively, the closest (55.5 mi), the median (4,414.7 mi), and the farthest (12,351.1 mi) country pairs in a large sample of

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bilateral trade flows (see Chapter 2). For Bahrain and Qatar, distance is estimated to reduce the estimate of bilateral trade flows by 39%; for Belgium and India, the reduction is 58%; for Indonesia and Guyana, the reduction is 121% (it exceeds the value of bilateral transactions). The success of the gravity model in explaining bilateral trade flows is due, to no small measure, to distance. For example, the standard trade model of complete specialization, without trading costs, makes two strong predictions. The first is that a country will import goods from all other countries in the world and the second that bilateral trade flows are proportional to the income of the two countries. Both predictions are way off the mark. Countries import from a small fraction of the potential pool of exporters and incomes alone overpredict actual trade flows by a large margin.

National borders represent a discontinuity of distance, caused by differences in legal systems and practices, languages, networks, competitive policies, and monetary regimes as well as by tariffs or tariff-equivalent restrictions aimed at discriminating against foreign producers. These differences tend to be less pronounced as countries become closer. On average, countries that share a common land border trade 80% more than countries that do not (see Chapter 2). In a well-publicized article, John McCallum concluded on the basis of 1988 data that, after accounting for income and distance, trade among Canadian provinces was 20 times larger than trade between Canadian provinces and the U.S. The difference between inter-provincial and inter-country trade was due to the Canadian-U.S. border. Other writers have refined the modeling and empirical testing of the border effect without disputing, however, its deterrence on international trade.

2. TRADE REGIONALIZATION AND REGIONAL TRADE AGREEMENTS

Regional trade agreements (RTAs) are an important and growing feature of the international trade system (see Chapter 3). RTAs have existed since the middle of the 19th century and were an offspring of colonialism. The newer ones have greater membership diversity, more of an outward orientation, and seek to go beyond "shallow" goods trade liberalization. The European Union (EU) is the best example of an RTA that pursues "deep" integration through liberalization of trade in services and investment and the establishment of common technical and regulatory standards, customs formalities, and government procurement practices. As Richard Pomfret remarks in Chapter 3, one should be careful in equating regionalization with the proliferation of RTAs: "Such counting is nonsense, because some arrangements are important but many are inconsequential."

Trade regionalization shows up in the raw data, and it is sharply rising in the ANDEAN Pact and MERCOSUR, slightly rising in the EU and NAFTA, stationary in APEC, and declining in ASEAN. This result is hardly surprising given that trade agreements are struck primarily by countries in close proximity of one another and that distance is a deterrent to cross-border trade. Thus, the working definition of trade regionalization is an excess of trade flows within a given area relative to the prediction of the gravity equation. Based on this criterion, there is strong evidence of regionalization and that national borders have been pushed outward to encompass regional areas (see Chapters 2, 5, 6, 8, and 10).

Some of the world's most economically dynamic countries are in Asia. ASEAN is the most important Asian RTA. China, Japan, and Korea are not members of ASEAN and are currently seeking to develop a tripartite trade arrangement that would work initially like NAFTA. The three countries, in 2002, accounted for 24% of the world population, 18% of the world GDP, and 13% of world trade. These percentages are bound to increase significantly in light of the much higher economic and international growth rates of China and Korea relative to the rest of the world. Korea may facilitate the formation of the tripartite arrangement in that it is a "natural" partner in a bilateral agreement with either China or Japan (see Chapter 8). The tripartite agreement would be a catalyst for an expansion and a deepening of ASEAN and gives an additional push for regionalization. It is not too far fetched to contemplate a world with three extremely large trading blocs, an expanded EU in Europe, a free-trade agreement in the Americas, and an ASEAN plus the China–Japan–Korea tripartite arrangement in Asia. This institutional regionalization would reflect, to a large extent, the regional pattern of international trade and business activities of multinational enterprises (MNEs). Would trade within the blocs expand more than trade among the blocs? Would large RTAs be able to resolve inter-bloc trade disputes easier than a more decentralized trade system? These are the questions for future research.

3. TRADE REGIONALIZATION AND MONETARY UNIONS

The thickness of the national border is affected, among other factors, by differences in monetary regimes. Countries that share the same currency and a common monetary policy trade significantly more than countries that do not.

There is a lively controversy on whether monetary integration can actually promote "real" integration, in opposition to the traditional theory that states the opposite direction of causality. The newer theory stresses that monetary unification enhances economic integration, not only through a higher degree of price transparency, more integrated capital markets and lower transaction costs but also through more predictable costs and product differentiation. Monetary unification is an engine of structural change and as such generates endogenously the criteria for an optimal currency area. In his exploration of the economics of monetary unions (see Chapter 4), Herbert Grubel discusses how a "hard currency fix changes the environment in which the institutions function." For example, European monetary unification broke the vicious cycle of unemployment, inflation, and currency depreciation. Also, monetary unification has increased capital market integration and, to a much lesser extent, labor market flexibility. It has also raised the overall level of trade among member countries, especially trade in goods and services differentiated along the dimension of variety, quality, or components used in the assembly of complex goods, the so-called intra-industry trade.

As a result of the increased intra-industry trade, external shocks exert a larger impact on the economies of member countries if they affect specific industries, like automobiles. On the other hand, external shocks affecting only one type of differentiated product, like large or Diesel-powered automobiles, have smaller effects: product differentiation makes it easier for industries to deal with such shocks.

The contribution of monetary union to economic stability of member countries stems from two sources. First, a common monetary policy eliminates exchange rate movements between member countries and their effects on trade and capital flows. Second, since most of member countries' trade is with each other, and the union as a whole is a relatively closed economy, exogenous shocks that alter the union's exchange rate have much diminished effects on all member countries. For example, the recent swing in the exchange rate between the U.S. dollar and the Euro, going from 1 to 1.3 in a relatively short time, has affected Germany's economy much less than a similar change in its own currency would have in the past. Germany's trade with the United States and other non-member countries, while significant, is only a fraction of its trade with member countries. These considerations, Grubel argues, suggest that regional monetary unions encourage regional expansion of trade and other economic activity. Such a regional effect can still lead to increased levels of trade and economic activity at the global level, especially if the increased regional trade results in greater average income and demand for foreign goods and services.

4. REGIONALIZATION AND TRADING COSTS

Trading costs change as a result of changes in technology, transportation and communication costs, and policy-driven administrative rules. Also cultural diversity – such as differences in language, customs, and religion – influences trading costs. In fact, cultural diversity acts like distance on trade flows: culturally diverse countries trade less than countries that share a similar culture. Rising trading costs, whether due to physical or cultural distance, have a larger negative impact on distant countries than on close countries. As the range of feasible transactions shrinks, trade becomes more regional. The opposite is true if trading costs decline. The range of feasible transactions expands and trade becomes more global. Diego Agudelo and Larry Davidson, in Chapter 5, show that the evidence for the G7 countries, over the period from 1980 to 1997, suggests that physical distance has worked toward regionalization and cultural distance has worked in balance toward globalization. Regionalization seemed to have prevailed in motor vehicles, electrical and non-electrical machinery, textiles, foodstuff, and instruments.

The same authors with Galia Julieta Benítez, in Chapter 6, demonstrate that a pattern of trade regionalization has also prevailed in South America from 1980 to 2001. Trade within Mercosur, the Andean Community, and between these two RTAs and Chile has grown relative to trade outside these confines, once one controls for the factors affecting bilateral trade in the gravity equation. This regionalization can be characterized as Spanish-speaking-centric. In terms of propensity to trade, Chile receives the highest score as the most outward-oriented country of the sub-continent, while Colombia and Ecuador receive the lowest scores. In terms of border effects, Argentina has traded less with Chile, Brazil, and Uruguay than is predicted by the gravity equation. By far, the biggest rise in border thickness has occurred between the two largest countries of South America, Brazil and Argentina.

5. REGIONALIZATION AND MULTINATIONAL ENTERPRISES

Regionalization in trade flows finds its counterpart in regionalization of the business activities of MNEs. Alan Rugman and Nessara Sukpanich underscore the fact that most of the world's 500 largest MNEs, on average, generate 70% of their revenues from their home region of the broad triad of North America, the EU, and Asia (see Chapter 7). MNEs that sell in the home region of the triad and try to expand their sales into other regions face a "foreignness" burden and do not succeed in expanding globally. This inability to expand globally could reflect inherent limits to the international transferability of a firm's firm-specific advantages (FSAs). National patents or regional standards – such as the EU "eco" label – are an obvious obstacle to the firm's global strategy. To achieve global reach, the FSA has to become a global standard or global brand. The evidence shows that knowledge and marketing ability has a home-region bias, whereas firm size can transcend the home region. Furthermore, a service firm tends to be more home-region oriented than a manufacturing firm.

A similar pattern emerges in a study of Asian MNEs authored by Alan Rugman and Simon Collinson (see Chapter 9). Only a handful of such firms – Sony, Canon, and Flextronics – have a global reach. Another handful – Toyota, Nissan, and Bridgestone – have a significant presence in two regions of the triad. For the rest of them, the bulk of revenues come from the home region of Asia. The reason is that the firms' FSAs were developed and enhanced in the domestic environment and thus reflect country-specific and regional economic, political and social factors. Toyota, Honda, and Sony are exceptions in having been successful to transfer to other markets of the triad some elements of their organizational practices and to adapt in environments outside their home region. Yet such unrepresentative "global" firms are the overwhelming focus of traditional research into the alleged differentiating characteristics and superior competitive advantages of Japanese firms.

6. TRADE, FOREIGN DIRECT INVESTMENT, AND TERRORISM

Terrorism is disruptive to both the economic and political process. Acts of terrorism are costly in that they require nations to incur immediately rescue, cleanup and reconstruction expenditures. In the longer term, terrorism raises anxiety and uncertainty in the community, which translate in a variety of risk premia. These premia add to cost and prices of goods and services – e.g., the terrorist premium on crude oil prices – and reduce the propensity to invest in projects. Finally, terrorism prompts governments to set up costly policies of counterterrorism. Part C of the volume examines trans-national implications of terrorism and counterterrorism. To detect potentially harmful transactions, flows of people and goods must be subject to costly inspection and monitoring. This translates into a transaction cost and ultimately into a reduction in total factor productivity. While all transactions are subject to this cost, a tighter border policy implies that cross-border transactions are potentially more lethal than domestic transactions and, thus, must bear a higher detection cost. This prediction results from the impossibility of raising costs only on undesirable transactions.

For Michele Fratianni and Heejoon Kang terrorism impacts on international trade through higher trading costs and hardening of borders (see Chapter 10). Trading costs rise in a once-for-all manner and largely independent of distance as a result of the threat of terrorism and the costly counterterrorism policies, implying that distant countries are affected less than close countries. Harder borders create a mixture of substitution of home transactions for cross-border transactions and "trade diversion." The evidence confirms these patterns. As distance increases between countries, the impact of terrorism declines. That is, the elasticity of bilateral trade with respect to distance declines for terrorism-affected countries, suggesting that some trade is redirected from close to more distant countries as a result of terrorism. The positive impact working through distance tends to offset the negative impact working through the level shift parameter. These findings are robust in the presence of natural disasters, technological disasters, the quality of national institutions, banking crises, and currency crises.

The economic consequences of safer borders are likely to hit hardest small and open economies, and to increase the home bias of international trade. It will also divert cross-border trade toward countries with smaller border restrictions. In an attempt to minimize the cost of hardened borders, some RTAs may experiment with common security perimeters. This, in turn, will lead to a deeper regional trade bias.

Survey evidence shows that multinational executives take into account political instability in making decisions about foreign direct investment (FDI). Yet, formal econometric studies cannot reliably duplicate the link between these two variables. Quan Li, in Chapter 11, tries to resolve this puzzle by focusing on the way foreign investors process expectations and uncertainty regarding the connection between political violence and investment decisions. The effects of different types of political violence – terrorism, civil war, and interstate war – are investigated separately and FDI involve two distinct but related decisions, one on investment location and the other on investment amount. The empirical analysis covers approximately 130 countries from 1976 to 1996. Unanticipated civil wars have adverse effects on investment choices regarding both location and magnitude; anticipated civil wars do not. Unanticipated interstate wars make it less probable for a country to be chosen as an investment location, but do not affect the size of the investment. Anticipated interstate wars do not influence investor choices over either location or magnitude. The same holds for anticipated terrorist attacks. Yet, it is puzzling that unanticipated terrorist attacks generate no effect on investment choices.

7. IN SUM

In sum, this volume contributes to the ongoing debate on regionalization vs. globalization. We start by challenging the validity of globalization, which has swept the academic and business communities, and show that the evidence is consistent with a pattern of regionalization in international trade, FDI and business activities of MNEs. We also show that terrorism is likely to further enhance regionalization. The end result is that several cherished notions must come into question. Is it practical to strive for a truly globalized trade system through costly and time-consuming trade rounds populated by a myriad of players with their agendas and conflicts? Would it not be better to let the world fully play out the regional option before implementing a global strategy? From a strictly negotiating viewpoint, we would benefit from having a smaller number of players representing the large trading blocs. Why is it so difficult for a firm to become truly global? The translation of domestic attributes into global ones faces large obstacles. What are the sources of these obstacles: physical, customs, government-imposed rules, or inability of management to operate in so many different environments? The pattern of a regional MNE is consistent with the pattern of trade regionalization. The constraints of the latter act directly on the activities of the former. Alternatively, we can think of the regionalization of MNEs as a constraint on trade regionalization. The volume raises this nexus but leaves the direction of causality to future research.

PART A:
THEORY OF REGIONAL INTEGRATION

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CHAPTER 2

BORDERS AND INTEGRATION

Michele Fratianni

ABSTRACT

National borders are a hurdle to the expansion of the open economy. Integration today remains imperfect because national borders translate into trading costs, including differences in monetary regimes. Political borders shelter many goods and services from external competition and, consequently, represent a critical exogenous force in the integration process. Small economies face thicker borders than large economies. Regional trade arrangements have softened or, in some cases, pushed outward national borders, but in the process new borders have emerged. Borders affect also finance and monies. While the speed of financial integration suggests currency consolidation and a decline in the ratio of independent monies to sovereign nations, the formation of multilateral monetary unions (MUs) pushes the ratio toward unity.

Perfect integration of national markets, just like perfect competition, is an ideal state with strong welfare properties. In practice, however, we live in a world of imperfect integration, with degrees of imperfection that are changing over time. During the gold standard of the late 19th and early 20th centuries, national markets were more integrated than either in the inter-war period or in the immediate post-World War II period. International integration, both real and financial, grew rapidly toward the end of the last

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century. Newspapers and popular literature have referred to this process as globalization. But globalization, in the strict sense of complete integration of national markets, never existed; nor is it likely to become a reality in the near future. The reason for imperfect integration is that many goods and services are sheltered from external competition either by transport costs, unfamiliarity with foreign trade practices, or outright protection. Political borders translate into thick bands of trading costs and represent a critical exogenous force in the integration process. Firms with market power apply strategies that enhance market segmentation. National policymakers respond to the pressure from domestic producers by relying on borders to give preference to domestic trade over cross-border trade. But domestic biases extend beyond goods and services. Financial and money transactions also have a home distortion.

National borders are changing, albeit slowly, under the pressure of regional and international trade agreements. Regional trade agreements (RTAs) have softened or, in some cases, pushed outward national borders and in the process have created new biases. Not only is there more trade inside RTAs than across RTAs, but integration also differs across different regions of the world.

The purpose of the paper is to assess the extent of border-created biases and the implications of borders for tests of integration. By design, I avoid two important topics: the welfare implications of borders and the political economy of altering or eliminating borders. The rest of the paper consists of three large sections: Section 1 on the effect of borders on trade in goods and services, Section 2 on finance, and Section 3 on national independent monies. Conclusions are drawn in Section 4.

1. BORDERS AND INTERNATIONAL TRADE

Bilateral trade flows are best explained by the gravity equation; see, among others, Bergstrand (1985, p. 474), Leamer and Levinsohn (1995, p. 1384), Deardorff (1998, p. 7), and Feenstra, Markusen, and Rose (2001, p. 431). This equation has been derived from different models of international trade, ranging from models of complete specialization and identical consumers' preferences (Anderson, 1979; Bergstrand, 1985; Deardorff, 1998) to models of product differentiation in a regime of monopolistic competition (Helpman, 1987) to hybrid models of different factor proportions and product differentiation (Bergstrand, 1989) to models of incomplete specialization and trading costs (Haveman & Hummels, 2004).

Under complete specialization in production, identical consumers' preferences and zero barriers to trade, country i imports from all other countries and its import from country j is equal to $Y_i Y_j / Y_w$, where Y is income and the subscripts refer to country i, country j, and the world, respectively (see, e.g., Deardorff, 1998, Eq. (2)). This gravity equation predicts way too much bilateral trade in relation to actual data. Furthermore, the prediction that each country imports from all other countries does not hold in reality. Haveman and Hummels (2004, p. 211) show that four-fifths of importers at the four and five-digit SITC level buy from fewer than 10% of available suppliers. One way to cope with this fact is to introduce trade frictions and let importers purchase from the cheapest exporters. By denoting with t_{ij} the ratio of prices paid by country i to prices charged by country j, the amount of imports of i from j becomes equal to $Y_i Y_j / t_{ij} Y_w$ (Deardorff, 1998, Eq. (11)). With trade frictions, bilateral trade flows fall by $1/t_{ij}$ relative to a frictionless world. In this case, the gravity equation can be written as follows:

$$\ln X_{ijt} = \alpha_0 + \alpha_1 \ln(Y_{it} Y_{jt}) + \alpha_2 \ln(D_{ij}) + \alpha_3 F_{ij} + \varepsilon_{ijt} \quad (1)$$

where X_{ijt} is the value of bilateral trade between country i and country j in year t, D_{ij} is distance between i and j, F_{ij} is a vector of other time-invariant factors that affect bilateral trade, and ε_{ijt} is a disturbance term.[1] The variables included in F fall into three categories: geographic ones (e.g., a common border), cultural ones (e.g., common language and common colonial ties), and common institutions (e.g., RTA membership).

Trade frictions emerge either because of distance or national borders. Distance is related to trading costs by the relationship $t_{ij} = D_{ij}^{\alpha_2}$, where α_2 in Eq. (1) measures the elasticity of bilateral trade with respect to distance. National borders represent a discontinuity of distance, a sort of jump due to (i) transaction costs and regime costs – such as differences in legal systems and practices, languages, networks, competitive policies, and monetary regimes – and (ii) tariffs or tariff-equivalent restrictions aimed at discriminating against foreign producers. Border frictions are more difficult to quantify than distance-related frictions.

In Table 1, I report the estimates of five different specifications of Eq. (1) using a large sample of 97,803 country-pair observations over the period 1980–1999 (Rose, 2000, 2003), details of the data can be found in the Technical Appendix at the end of the volume. The dependent variable is a simple average of four bilateral flows – exports from i to j, imports of i from j and corresponding flows for the other trading partner – measured in constant U.S. dollars. In the first column of the table, the logarithm of X is

Table 1. Distance, Borders, Culture, and Institutions.

Variable	Dependent Variable: Log of Bilateral Trade, 1980–1999				
	Income	Plus Geography	Plus Culture	Plus Common Institutions	Plus Separate Institutions
Intercept	−34.3839*	−27.3525*	−28.9659*	−29.2732*	−29.1173*
	(0.1422)	(0.1336)	(0.1353)	(0.1352)	(0.1365)
Log of real GDP	0.7662*	0.8146*	0.8374*	0.8369*	0.8382*
	(0.0029)	(0.0025)	(0.0025)	(0.0025)	(0.0025)
Log of real per capita GDP	0.5067*	0.4989*	0.4982*	0.4901*	0.4824*
	(0.0048)	(0.0043)	(0.0043)	(0.0043)	(0.0044)
Log of distance		−1.1354*	−1.0094*	−1.0372*	−1.0497*
		(0.0078)	(0.0076)	(0.0078)	(0.0080)
Common border		0.5874*	0.4572*	0.3827*	0.3675*
		(0.0383)	(0.0384)	(0.0380)	(0.0380)
Common language			0.4237*	0.3936*	0.3828*
			(0.0146)	(0.0146)	(0.0146)
Common country			0.6907**	0.5065***	0.5665**
			(0.3187)	(0.2752)	(0.2747)
Common colonizer			0.6333*	0.5829*	0.5939*
			(0.0249)	(0.0249)	(0.0249)
Colonial relationship			1.3516*	1.3722*	1.3554*
			(0.0285)	(0.0284)	(0.0285)
Common currency				0.9623*	0.9545*
				(0.0744)	(0.7408)
Common RTA				0.9244*	0.9234*
				(0.03632)	(0.0359)
Inter-regional					0.1709*
					(0.0152)
Observations	97,803	97,803	97,803	97,803	97,803
R^2	0.5803	0.6690	0.6823	0.6847	0.6850

Note: Robust standard errors are shown in parentheses. Results for time dummies are not reported. For definition of the variables, see the Technical Appendix at the end of the volume.
*Statistical significance at 1% level.
**Statistical significance at 5% level.
***Statistical significance at 10% level.

regressed on the logarithm of the product of real GDP, also measured in U.S. dollars, as well as on the logarithm of the product of real per-capita GDP. Trading costs, geography, cultural factors, and institutional arrangements are ignored. The elasticity of X with respect to income is 1.25, above the prediction of unitary elasticity from models of complete specialization.

Population growth, for a given level of real income, retards bilateral trade flows. Trading costs, proxied by distance, and common land borders, are added in column 2, and raise substantially the explanatory power of the gravity equation. The elasticity of X with respect to distance is -1.13. Distance is a big negative force on trade and its impact rises sharply as countries are farther apart. Take Bahrain and Qatar, Belgium and India, and Indonesia and Guyana, which are, respectively, the closest (55.5 mi), the median (4,414.7 mi), and the farthest (12,351.1 mi) country pairs in the sample. The impact of distance on trade flows – measured by the product of the coefficient of distance and the logarithm of distance as a proportion of the logarithm of bilateral trade flows – is 0.39 for Bahrain–Qatar, 0.58 for Belgium–India, and 1.21 for Indonesia–Guyana.

The negative impact of distance on trade is mitigated by common land borders. On average, countries that share a border trade 79% more than countries that do not ($\exp(0.5874) = 1.79$), a result that is consistent with a reduction of trading costs resulting from countries knowing each other well. Common cultural traits – such as common language, common political affiliation, and common colonial past – enhance bilateral trade flows and play a role similar to a shared land border; see column 3 of the table.

1.1. Regional Borders and Common Currency

The proliferation of RTAs is a feature of the international trade system; see, for example, Fratianni and Pattison (2001) and references therein. RTAs have existed since the middle of the 19th century and were an offspring of colonialism. The newer RTAs have greater membership diversity, more of an outward orientation, and seek to go beyond "shallow" goods trade liberalization. The EU is the best example of an RTA that pursues "deep" integration through liberalization of trade in services and investment and the establishment of common technical and regulatory standards, customs formalities, and government procurement practices.

On the relationship between currency unification and trade intensity, Frankel and Rose (1998) and Rose (2000) have questioned the traditional direction of causality from "real" integration to monetary integration and have proposed instead the opposite hypothesis of monetary unification enhancing economic integration, not only through a higher degree of price transparency and lower transaction costs, but also through more predictable costs and product differentiation. Rose (2000) found that countries that share the same currency trade 235% more than countries that do not share the same currency. This finding is controversial and I shall return to it later on in the paper.

The impact of regional integration and common money on bilateral trade flows is shown in column 4 of Table 1. Regional integration is captured by a dummy variable that is equal to one if the two countries belong to the same RTA, otherwise it is zero; the sample identifies 11 separate RTAs, which are listed in the Technical Appendix at the end of the volume. Monetary integration is captured by a dummy variable that is equal to one if the two countries share the same currency, otherwise it is zero; the list of common-currency countries can also be found in the Technical Appendix. Both regional and monetary integration have a strong and similar impact on trade. Countries that belong to the same RTA trade 150% more than countries that have no such agreements ($\exp(0.92) = 2.50$).[2] Countries that share the same currency trade 161% more than countries that are not integrated under a common money ($\exp(0.96) = 2.61$), an effect that is lower than Rose's.

Column 5 of Table 1 adds an inter-regional dummy variable that is equal to one if the two countries in the pair belong to separate RTAs. The positive and statistically significant coefficient of the inter-regional dummy implies that regionalization has not produced the much feared trade diversion.[3]

1.2. More on Borders

The evidence presented so far points to a national border effect in the sense that countries that share a common border trade more than countries that do not. Furthermore, there is an economically and statistically significant border effect also for those countries that are part of a RTA. I explore further the border issue in Table 2, where I have divided the sample into two groups, the country pairs that share a common land border (2,387 observations) and those that do not (95,415 observations). The results confirm that common-border countries face smaller trading costs than other countries: the elasticity of bilateral trade with respect to distance for common-border countries is now estimated at -0.75. Furthermore, many aspects of trade that were significant for the entire group are either statistically insignificant or irrelevant (e.g., common country and colonial heritage), or less important (e.g., common language and currency unions), or outright reversed in their impact (e.g., inter-regional).

Being geographically very close reduces or nullifies the advantages of common cultural ties and common institutions. Common-border countries

Table 2. Distance and Common Borders.

Variable	No Common Borders	Common Borders
Intercept	−29.6644*	−17.2329*
	(0.1387)	(0.5730)
Log of real GDP	0.8453*	0.5886*
	(0.0025)	(0.0176)
Log of real per capita GDP	0.4937*	0.4020*
	(0.0044)	(0.0244)
Log of distance	−1.0471*	−0.7483*
	(0.0081)	(0.0525)
Squared log of distance	—	—
Common language	0.3792*	0.2410*
	(0.0149)	(0.0691)
Common country	0.4722	NA
	(0.2791)	
Common colonizer	0.6001*	0.1279
	(0.0251)	(0.1392)
Colonial relationship	1.4608*	−0.0492
	(0.0278)	(0.1021)
Common currency	0.8468*	0.6483*
	(0.0811)	(0.1623)
Common RTA	1.0315*	0.8499*
	(0.0404)	(0.0611)
Inter-regional	0.1606*	−0.5375*
	(0.0153)	(0.1217)
Observations	95,416	2,387
R^2	0.6794	0.7684

Note: Robust standard errors are shown in parentheses. Results for time dummies are not reported. For definition of the variables, see the Technical Appendix at the end of the volume.
*Statistical significance at 1% level.

that share the same currency trade more than common-border countries with separate currencies, but the size of the difference is smaller than for countries that are farther apart. On the other hand, there is a strong and negative impact on bilateral trade flows of two countries belonging to separate RTAs. Thus, trade diversion appears to be a function of closeness, with closer countries being more sensitive to competing institutions than farther countries.

The size of the national border was at center stage in McCallum (1995) who applied a form of Eq. (1) to 1988 exports and imports among 10 Canadian provinces and 30 U.S. states, coding a dummy variable equal to 1 for inter-provincial trade and 0 for province-to-state trade. The point estimate of the dummy variable, the size of the border effect, is approximately 3 and statistically significant under a variety of tests, implying that inter-provincial trade is approximately 20 times larger than trade between provinces and states. Helliwell (1996) confirmed these findings with data for the province of Quebec, with the obvious intent of underscoring the implied trade consequences of a possible separation of this province from Canada.

Anderson and van Wincoop (2003) criticized McCallum's findings of very thick borders for ignoring the asymmetric impact on trade of barriers between small and large economies and multilateral protection levels. They re-estimated the gravity equation, using McCallum's exact specification and data, alternatively from the viewpoint of Canada and the United States, and found that the border from the Canadian viewpoint is 10 times as wide as from the viewpoint of the United States. Since Canada's economy is approximately one-tenth of the United States', the level of protection imbedded in a border is a positive function of the size of the economy. Anderson and van Wincoop's gravity equation predicts that trade flows from region i to region j depend, among other factors, on bilateral and multilateral trading costs. When multilateral costs rise relative to bilateral costs, trade flows rise between i and j. Furthermore, the smaller the country the larger is the fraction of its output exposed to trading costs. An increase in protection redirects output from outside to inside the border, the degree of which being a positive function of the openness of the economy. In sum, protection thickens borders more for the small than the large country.

Border effects also show up in prices. The law of one price is the traditional criterion for judging whether two markets are integrated. Transportation costs place a natural wedge on the law of one price. But even adjusting for transportation costs, prices of the same product sold in two different locations may differ because of the power of firms to price discriminate. Less than perfect competition is a necessary but insufficient condition for market segmentation. If consumers can arbitrage price differences, net of transportation costs, market integration can coexist with imperfect competition. In addition to transportation costs and domestic price discrimination, national borders add three types of potential friction: formal trade barriers in the form of tariff and non-tariff protection, informal trade barriers, and exchange rates. Formal trade barriers create a wedge between prices paid by consumers in the importing country and prices charged by the firm in the exporting country. Informal trade barriers are more difficult to quantify because they find their roots in business and social networks. These networks – e.g., groups of the same ethnicity or religion, business alliances, and long-term relationships with foreign suppliers – facilitate international trade through better flows of transnational information and by tempering opportunistic behavior.

The link between the exchange rate and the border occurs through the translation of foreign-currency prices into domestic currency equivalent. Let P_i^x and P_j^x be the price of good x in countries i and j, respectively, denominated in the countries' respective currencies; let S_{ij} be the exchange rate defined as units of currency i per unit of currency j. The ratio $P_i^x/S_{ij}P_j^x$ is the price of good x sold in country i relative to the price sold in country j expressed in i's currency, and it is equal to 1 if the law of one price holds. The exchange-rate pass-through measures the effects of a depreciation of currency i on local prices. Early work by Kreinin (1977) suggested that the exchange-rate pass-through – that is, the effect of a currency depreciation on local prices – was much less than complete for the United States, Germany, and Japan. Firms can use exchange rate changes to price discriminate, a point made by the pricing-to-market literature; for a review, see Goldberg and Knetter (1997, pp. 1252–1262). For example, Marston (1990) found that Japanese exporters of microwave ovens offset 30% of yen appreciation by reducing yen export prices. The implication is that P_i^x and P_j^x are sticky in relation to S_{ij}, and $P_i^x/S_{ij}P_j^x$ will fluctuate (the higher the correlation between changes in S_{ij} and in $P_i^x/S_{ij}P_j^x$, the higher the degree of price stickiness). Thus, a variable exchange rate adds to the border effect.

Engel and Rogers (1996) test the hypothesis that price dispersion of similar products is affected not only by distance but by border as well. These authors used Canadian and U.S. city price data for 14 sub-categories of the consumer price index. Price dispersion is measured by the sample average of the standard deviation of $\Delta \ln(P_i^x/S_{ij}P_j^x)$, where i and j index cities; the exchange rate is equal to 1 when the pair of cities are located in either Canada or the United States. The descriptive statistics indicate that dispersion differs from product to product,[4] and is on average higher between across-the-border cities than within-the-border cities. Engel and Rogers regressed price volatility on distance and a border dummy, and found strong positive and statistically significant effects for both. The headline result is that the Canada–U.S. border is equivalent to a distance of 75,000 mi. Price stickiness accounts for only part of the border effect.

Another way of assessing border effects is to compare domestic deviations from purchasing power parity with international deviations. Let P_i and P_j be the price index in location i and j, respectively. Domestic purchasing power occurs when $P_i/P_j = 1$, i and j being locations using the same currency; international purchasing power occurs when $P_i/S_{ij}P_j = 1$, i and j being locations separated by a fluctuating exchange rate. Parsley and Wei (1996) used prices of 51 products for 48 U.S. cities to estimate the convergence rate to (PPP). The authors rejected that $\ln(P_i/P_j)$ follows a random walk in favor of the alternative specification of a zero-mean auto-regressive process of order one. The latter yields that implied half-life deviations from PPP are between four and five quarters for tradables, much lower than half-life deviations in an international context. This difference in convergence rates is consistent with a border effect. The implication is that if two countries were to adopt the same currency, the border effect would become smaller.

In sum, national borders represent a discontinuity in trading costs. Country pairs that share a common border face smaller trading costs, as measured by distance, than country pairs separated by other nations. Intra-regional trade flows, ceteris paribus, are larger than inter-regional trade flows. The intra-regional trade bias applies to flows that occur within a sovereign nation as well as to those within a group of countries that belong to RTA. The size of the national border is asymmetric: the small economy faces a thicker border than the large economy.

2. BORDERS AND FINANCIAL INTEGRATION

Financial integration is much more than high capital mobility, although there is a tendency in the macroeconomic literature to treat capital mobility and international financial integration as equivalent. High capital mobility is a necessary but not a sufficient condition for financial integration. It takes more than removing restrictions to the flows of capital and foreign exchange transactions to achieve global finance. Unhampered market access, adoption of financial standards, and non-discriminatory financial regulation are part of the requirements for global finance; see George von Furstenberg (1998). Given space limitations, I will stick to tradition and report on the necessary condition of financial integration.

The prevailing wisdom is that whatever the degree of "real" integration in the world, financial integration is a notch or two higher. After all, capital, especially finance capital, moves faster than goods, services, and people. Furthermore, modern-day capital flows, according to Bordo, Eichengreen, and Irwin (1999), after the long pause of the inter-war and Bretton Woods years, have regained and surpassed those of the heyday of the classical gold standard.[5]

2.1. Tests of Integration for Financial Capital

Despite the widely held perception of a global financial village, the accumulated evidence suggests financial segmentation, with degrees of segmentation depending on assets and countries. Finance too has borders.

Typically, tests of financial integration (or for the necessary conditions of financial integration) rely on the law of one price. Take the covered interest rate parity (CIRP)

$$i - i^* - fp = (i - i^o) + (i^{*o} - i^*) + (i^o - i^{*o} - fp) \tag{2}$$

where $i =$ yield on domestic assets, $i^* =$ yield on comparable foreign asset, $fp =$ forward premium of the foreign currency (spot and forward rates are measured as units of domestic currency per unit of foreign currency), and "*o*" refers to the offshore location. Several factors can explain departures from CIRP: lack of homogeneity in the underlying assets, transaction costs, differences in tax rates, differences in credit risk of the issuers, and restrictions on capital flows and foreign exchange market.

Eq. (2) separates departures from CIRP into two locational components and everything else. The latter is the CIRP applied to equivalent financial assets traded in the same offshore market. Offshore CIRP has been holding for short-term maturities for widely traded currencies for quite some time (e.g., Fratianni & Wakeman, 1982). The locational components reflect controls on capital flows and foreign exchange market as well as sovereign risks. Capital controls started in earnest in the early 1930s and petered out, at least in much of continental Europe, toward the latter part of 1980s. For example, French and Italian tight controls on capital outflows were priced as an exit tax, creating a negative difference between onshore and offshore interest rates in the 1970s and the 1980s (Obstfeld, 1995, Table 1; Fratianni & Spinelli, 2001, Fig. 10.3). Chile, from 1991 to 1998, enacted a tax on inflows in the form of a zero interest rate reserve requirement. That tax placed a wedge of approximately 3 percentage points between onshore and offshore short-term interest rates (Herrera & Valdés, 2001, Fig. 3).

Only for countries that have no capital and foreign-exchange controls and share similar sovereign risk can onshore CIRP hold. This was true of the EU countries in the 1990s (Holmes, 2001). But for the vast majority of countries that have neither offshore nor forward markets, the relevant parity to be tested is the uncovered interest rate parity.[6] This parity does not hold (see, e.g., Montiel, 1994) and its failure may well result from the relative weight of country and currency risk premia and their interactions. For most industrial countries, country risk is small relative to currency risk and is relatively stable. For emerging market economies, country risk has a larger weight than in industrial countries and interacts with currency risk in a complex way. For example, in Argentina country risk was larger than currency risk for most of 2000. In October 2001, the Argentine central bank estimated currency risk at 21.6 percentage points and country risk at 30.3 percentage points (http://www.bcra.gov.ar, Department of Financial Analysis and Information, October 2001). Possibly, country risk was picking up some of the effects of the impending demise of the Argentine currency board.

In sum, the border effect is imbedded in the two locational terms of Eq. (2); these, in turn, can spark departures from onshore CIRP even when offshore CIRP holds. National policymakers can and have used the border to insulate their national money and capital markets from those abroad. It is more difficult to quantify the size of the border effect in the absence of offshore markets.

2.2. Tests of Integration for Physical Capital

Feldstein and Horioka (1980) have challenged the view that markets for physical capital are integrated. Using data from 16 OECD countries for the period 1960–1974, these authors show that national investment (in fixed capital) as a ratio of GDP (denoted as I) is primarily financed by national saving as a ratio of GDP (denoted as S). In a cross-section regression of the type

$$I_i = \alpha + \beta S_i + u_i, \quad i = \text{country } 1, 2, \ldots \ N \tag{3}$$

Feldstein and Horioka tested and failed to reject the null hypothesis of $\beta = 1$ of zero (physical) capital mobility. Feldstein and Horioka instigated a vast empirical literature, which found lower values of β, especially for the 1980s, but did not disprove its basic tenets (see survey article by Coakley, Kulasi, & Smith, 1998). Moreover, there is plenty of criticism in the literature on what this test means for capital mobility. Here are the three most significant ones.

The first criticism regards the identifying assumptions underlying β. In a classical model the real rate of interest affects I negatively, S positively, and the current-account balance B negatively (and hence the capital-account balance positively), subject to the equilibrium condition of $S_i - I_i = B_i$, $\beta = I_r/(I_r + S_r + B_r)$, where I_r, S_r, and B_r are the slope coefficients of I, S, and B with respect to the real rate of interest (Coakley et al., 1998, pp. 172–173). $\beta = 1$ when both S_r and B_r equal to zero, and $\beta = 0$ (perfect capital mobility) when either S_r or B_r, or both, tend to infinity. So what drives perfect capital mobility: an infinitely elastic saving rate or an infinitely elastic capital account? The identification problem becomes more complex with general-equilibrium models.

The second criticism concerns β and the size of the country. Refer to the equilibrium condition $S_i–I_i = B_i$ in a world of perfect capital mobility. Assume a shock to S. If the shock occurs in a small open economy, the world rate of interest and the national I schedule will remain unchanged, and ΔS will be reflected in ΔB: for example, a positive shock implies a larger net export of capital, and $\beta = 0$. If the shock occurs in a large economy, the world rate of interest and the national I schedule will change. A positive shock implies a lower world rate of interest and a higher national I; hence, S and I will be positively correlated, and $\beta > 0$. Thus, the estimate of β is positively correlated with the size of the economies (Harberger, 1980). The final criticism concerns the use of cross-section data. Typically, the observations are averages of long-annual time series. Given that the long-run value of $B_i = 0$ (a country can neither permanently lend nor permanently borrow), the value of β is biased toward unity.

Notwithstanding these criticisms, the repeated studies have confirmed the positive association between investment and saving, to the point that now the finding has been elevated to the rank of a "major puzzle" in international macroeconomics (Obstfeld & Rogoff, 2001). It is a puzzle because our strong prior is that capital is mobile, and our prior has been fed by the evidence on CIRP. But CIRP applies to a narrow spectrum of financial assets and not to physical capital (Dooley, Frankel, & Mathieson, 1987, pp. 522–523). For physical capital, the relevant law of one price is real interest rate parity, which can be expressed as follows (Frankel & MacArthur, 1988):

$$r - r^* = (i - i^* - fp) + (fp - \Delta e) + (\Delta e - \pi + \pi^*) = 0 \tag{4}$$

The new symbols are $r =$ the ex-ante real rate of interest, $\Delta e =$ the expected depreciation of the home currency, and π the expected rate of inflation. Eq. (4) is consistent with $\beta = 0$ in Eq. (3) (Dooley et al., 1987; Lemmen & Eijffinger, 1995). The evidence overwhelmingly rejects Eq. (4), and not surprisingly. For Eq. (4) to hold, three conditions need to be simultaneously satisfied: CIRP (the first term in parentheses in the equation); the forward premium as an unbiased estimate of the expected depreciation (second term); and expected purchasing power parity (third term). The first of these three conditions, as we have noted, has empirical corroboration for few currencies and a very narrow set of assets. The second fails miserably (Kang, 1992). On the third, we have noted that the half-life convergence of international real exchange rate is much longer than its domestic counterpart (see also Obstfeld & Rogoff, 2001). In sum, the failure of real interest rate parity supports the basic contention of Feldstein and Horioka that β in Eq. (3) is different from zero.[7]

The Feldstein and Horioka finding seems to be consistent with two home biases, one in equities and the other in consumption. The domestic bias in equities is measured relative to the asset diversification predicted by the international capital asset pricing model (Solnik, 1996, Chapter 5). Given historical mean returns and variances, the model predicts that the weight of foreign equities should be much higher than the observed weight. The discrepancy between predicted and actual weight remains large even under the assumption of infinite relative risk aversion (Lewis, 1999, Table 2). The bias could stem from the failure of the capital asset pricing model to predict diversification, or from the failure of PPP, which is a standard assumption of the international capital asset pricing model, or from the failure of both; there is no way to distinguish between the two. Various attempts to justify the equity home bias have also failed. For some researchers, the bias does not exist because the large standard deviations underlying means and variances of returns makes it difficult to reject the hypothesis that a domestic-only portfolio is worse than an internationally diversified portfolio.[8]

The domestic consumption bias is measured relative to the prediction made by a model where markets are complete in the Arrow–Debreu sense and countries diversify risks due to idiosyncratic shocks (Obstfeld & Rogoff, 1996, Chapter 5). In this setting, the growth rate of domestic consumption is equal to that of foreign consumption. The data clearly refute the implication of complete markets (Lewis, 1999, Table 1). International risk sharing is not only small relative to prediction but also smaller than among regions of the same country. In an early article on the subject, Atkeson and Bayoumi (1993) show that regional capital flows within the United States are larger than among countries. Similar results were obtained for Canada (Bayoumi & Klein, 1997). Kleimeier and Sander (2000) provide evidence that financial integration is primarily a regional phenomenon using data from six core EU countries, Japan and the United States. Not only financial flows but also flows of physical capital are more mobile within the regions of the same country than among countries. Helliwell (1998) reports the results of a Feldstein and Horioka regression with data from the OECD countries and Canadian provinces. The coefficient of the provincial saving variable is negative, statistically significant, and of a size comparable to the coefficient of national saving, implying that capital is very mobile within Canada.

In sum, physical capital is more mobile within the regions of a country than across countries. The same is true for finance capital. Finance capital is more mobile than physical capital. Financial integration in deep RTAs like the EU is higher than global integration. National boundaries are an obstacle to international capital flows and the geographic diversification of assets. As it is true for trade, national borders are a constraint to the expansion of the open economy. Regional arrangements expand national borders and create their own borders.

3. BORDERS AND MONIES

For the late Rudi Dornbusch (2001, p. 238): "A century ago, being a civilized country meant being on the gold standard." Then, after the disruption of financial integration in the wake of World War I, monies became identified with nations, just like flags and airlines. Governments exerted the tightest grip on their monopoly of fiduciary monies: currency substitution did not exist and cross-border money flows were limited except for the key currencies. Money had been nationalized. Yet, throughout the ages, the norm was money competition and cross-border money flows. From the 5th to 7th century the Byzantine *nomisma* was the unchallenged coin (Cipolla, 1956). The *nomisma* was displaced in the low–middle ages by the Islamic *dinar*; and the *dinar*, in turn, was displaced in the higher–middle ages by the Florentine *fiorino*, first, and the Venetian *ducato*, later. These coins were the dollars of the middle ages, as Cipolla puts it, because they had high unitary value, stable purchasing power and were issued by political entities with a leading position in international commerce. In more recent time, 1870–1914, the British pound rose to the status of dominant currency, reflecting British attachment to the gold standard and British supremacy in trade and banking.

For the bulk of the 19th century, monies and nations matched with few exceptions. These exceptions tended to be very small open economies with historical ties with the countries' adopted legal tender and often imbedded inside their borders: Andorra, Liechtenstein, Monaco, Nauru, Panama, San Marino, Tuvalu, and the Vatican (see Table 3). The Belgium-Luxembourg Economic Union was the lonely bright spot of a cooperative monetary union (MU) between sovereign states. Toward the end of World War II, a handful of small islands in the Pacific adopted the Australian or the U.S. currency as their legal tender. Currency consolidation received a modest boost with the formation of the East Caribbean Currency Union in the

Table 3. Existing Unilateral and Multilateral Monetary Unions with Independent States.

Starting Year	Country	Currency	Population ('000)	Income per Capita in U.S. $
Pre-World War II				
1278	Andorra	French franc, peseta, and euro	69	19,000
1865	Monaco'	French franc and euro	32	27,000
1892	Tuvalu	Australian dollar	11	1,100
1897	San Marino	Italian lira and euro	28	34,600
1904	Panama	U.S. dollar	2,900	3,260
1921	Liechtenstein	Swiss franc	33	25,000
1922, BLUE	Belgium, Luxembourg	Belgian franc in both countries, Luxembourg franc in Luxembourg; euro	See below	See below
1914	Nauru	Australian dollar	12	5,000
1926	Vatican City	Italian lira and euro	1	NA
Post-World War II				
1943	Kiribati	Australian dollar	93	830
1944	Marshall Islands	U.S. dollar	52	2,190
1944	Micronesia	U.S. dollar	120	2,150
1944	Palau	U.S. dollar	19	6,730
1965, East Caribbean Currency Union	Anguilla	East Caribbean dollar; regional central bank	13	8,600
	Antigua and Barbuda		69	9,390
	Dominica		72	3,180
	Grenada (1967)		102	3,500

	Montserrat		9	3,400
	St Vincent and Grenadines		116	2,820
	St Christopher Kitts-Nevis		46	6,370
	St Lucia		158	3,840
1973, West African Monetary Union	Benin	CFA franc; regional central bank; roots go back to 1959	6,300	380
	Burkina Faso		11,800	220
	Ivory Coast		16,000	660
	Mali		11,300	240
	Niger		10,800	180
	Senegal		9,800	490
	Togo		4,700	300
1994, Central African Monetary Union	Cameroon	CFA franc; regional central bank; roots go back to 1959	15,200	570
	Central African Republic		3,600	290
	Chad		7,600	200
	Republic of Congo		2,900	630
	Equatorial Guinea (1985)		1,200	3,180
	Gabon			
1999, EMU	Austria	euro; common central bank	8,100	23,400
	Belgium		10,300	27,350
	Finland		5,200	23,500
	France		59,400	22,000
	Germany		82,500	22,600
	Greece (2001)		10,600	11,600
	Ireland		3,900	23,900
	Italy		57,900	19,000
	Luxembourg		444	38,800
	Netherlands		16,100	23,900

Table 3. (*Continued*)

Starting Year	Country	Currency	Population ('000)	Income per Capita in U.S. $
	Portugal		10,000	10,800
	Spain		41,100	14,400
2000	Ecuador	U.S. dollar	12,900	1,080
2001	El Salvador	U.S. dollar	6,400	2,040

Note: Population and income per capita, in current U.S. dollars, are from the World Bank, World Development Indicator Database; otherwise (indicated with an asterisk) from the CIA, Factbook. Income per capita are GNI for the World Bank and GPD for the CIA. The data are the most recent. The countries listed above are independent states. The number of unilateral currency unions would be longer if we were to consider dependencies, colonies, and self-governing regions, such as the Channel Islands (pound), Cocos Islands (Australian dollar), Cook Island (New Zealand dollar), Northern Cyprus (Turkish lira), Greenland (Danish krone), Guam (U.S. dollar), Montenegro (euro), Niue (New Zealand dollar), Norfolk Island (Australian dollar), Northern Mariana Islands (U.S. dollar), Pitcairn Island (New Zealand and U.S. dollars), Puerto Rico (U.S. dollar), Saint Helena (pound), American Samoa (U.S. dollar), Tokelau (New Zealand dollar), Turks and Caicos Islands (U.S. dollar), British Virgin Islands (U.S. dollar), and U.S. Virgin Islands (U.S. dollar).
Source: Central Intelligence Agency, Factbook; Clément, Mueller, Cossé, and Le Dem (1996, Box 1); Cohen (1993, Appendix); Edwards (2001, Table 1); Levy-Yeyati and Sturzenegger (2001, Table 1); Statesman's Yearbook, various years; World Bank, World Development Indicators Database; and World Currency Yearbook, various years.

1960s, the West African Monetary Union in the 1970s and the Central African Monetary Union in the early 1990s; and a big boost with the European Monetary Union (EMU) of 1999. All in all, multilateral MUs have been much more significant than unilateral MUs like Ecuador's and El Salvador's.

3.1. OCA Literature and Extensions

What defines an optimal MU? Are there too many MUs? How many of them should there be? These are the questions raised by the optimal currency area (OCA) literature. If the selection criterion were the efficiency of money as a medium of exchange, the answer would be easy: since the usefulness of money rises as more people use it, the world would be the optimal area. But there is more than one criterion. The early OCA literature tried to give an answer to the question of what exchange rate regime is best suited to achieve simultaneously a country's internal balance (non-inflationary trend output) with external balance (sustainable balance-of-payments position). This led Mundell (1961) to emphasize factor mobility as a pre-condition for OCA. Without factor mobility and with price and wage rigidities, it is up to the exchange rate to restore external balance. The national border, as we have seen, creates a discontinuity in price and wage adjustments and factor mobility. Without those borders the size of the optimal currency would change; this is the link between national sovereignty and OCA (Cesarano, 1997).

Mundell went further and identified common shocks as a second pre-condition of OCA. McKinnon (1963) focused on openness of the economy as a criterion for OCA. The more open the economy, the less important the exchange rate in changing the country's terms of trade; the small open economy is, in fact, defined to be a price taker in the world market. Kenen (1969) underscored product diversification – a more diversified economy is less prone to external shocks and hence does not require changes in the exchange rates.

Without denying the valuable insights of this literature, its impact has been rather limited because its messages are inconclusive and inconsistent (Tavlas, 1994). They are inconclusive in the sense that the criteria cannot be measured unambiguously and consequently weights cannot be assigned to them. They are inconsistent in the sense that one criterion points in one direction (e.g., a small open economy is very open but undiversified), while another points in the opposite direction (e.g., a large economy is relatively closed but has a high degree of product diversification). Furthermore, OCA criteria do not predict what geographical areas in the world should become MUs. Political factors that determine national borders also determine MUs.

Two big events of the 1990s have reactivated interest in OCAs. The first was EMU, which has shown that the nexus because national sovereignty and MU can be broken. The second was the accelerating tempo of currency crises in the world: Mexico in 1994, Southeast Asia in 1997, Russia in 1998, Brazil in 1999, Argentina in 2001, Uruguay, and again Brazil in 2002. While the proximate causes of the crises may be somewhat idiosyncratic, the spread of information and communication technology and rising financial integration are common to all of them. The speed with which we consummate transactions has raised the degree of currency substitution and has rendered currencies of small open economies uncompetitive in relation to those of large and stable economies.

Cohen (2000, p. 29) asserts that "the number of monies that actually succeed in gaining some degree of general acceptance is sure to be reduced dramatically." Dornbusch (2001) titles his article: "Fewer Monies, Better Monies;" Rogoff (2001) titles his: "Why Not a Global Currency?" Alesina and Barro (2002) formulate a model that predicts that the equilibrium ratio of independent currencies to countries falls as the number of countries in the world rises. Countries become smaller as their number increases. Since the relative importance of cross-border transactions is inversely related to country size, the value of a MU also rises because of its ability to lower trading costs. The denationalization of money, on the other hand, creates benefits and costs. The benefits accrue in the form of policy credibility for those countries that cannot pre-commit to stable inflation rates through domestic discretionary policies. The costs manifest themselves in the inability to use national monetary policy to offset idiosyncratic shocks. Common sense suggests that very small countries gain more in credibility than they lose by giving up discretionary monetary policy. The opposite is true for very large countries. The battle is fought in the middle.

Returning to the theme of currency consolidation, the world has lost 14 national currencies and gained one since 1999 (Table 3). It would appear that the ratio of independent currencies to sovereign states has indeed dropped. But this measurement assumes that EMU, in steady state, is a collection of 12 sovereign states. If, instead, EMU is counted, expectationally, as one country the ratio has changed only marginally. In fact, the distinction between unilateral and multilateral MU alters the interpretation of the Alesina–Barro model. If currency consolidation occurs through dollarization, the ratio of currencies to countries declines as the world becomes more atomistic. If, instead, currency consolidation occurs through multilateral MUs that also require political unifications, the ratio does not change. Two points are worth emphasizing.

The first is that unilateral MUs, as opposed to multilateral MUs, face a severe disadvantage that is not sufficiently emphasized by the literature: the link between money and power. Take Argentina, for example, a country for which many experts had advocated dollarization as an improvement over the currency board (see, e.g., Schuler & Stein, 2000). The government of Argentina made overtures to the U.S. government about the terms of a possible dollarization, namely whether the United States would be willing to share seigniorage, give access to the Federal discount window, and cooperate on bank supervision. The response to that inquiry can be found in the "International Monetary Stability Act of 1999" (the Act).[9] This Act states unequivocally that "the Federal Reserve System has no obligation to act as a lender of last resort to the financial systems of dollarized countries; … no obligation to consider the economic conditions of dollarized countries when formulating or implementing monetary policy; and the supervision of financial institutions in dollarized countries remains the responsibility of those countries" (Section 2, Part b). The Act allows for the U.S. Treasury to rebate 85% of the seigniorage resulting from currency flows after "official" dollarization; there is no rebate on the stock of currency before official dollarization. To enjoy the rebate on the new currency flows, dollarized countries would have to surrender U.S. Treasury securities and receive in exchange an equal amount of U.S. currency and interest-bearing U.S. perpetuities. The Act states that coupon payment on these perpetuities "is rendered null and void upon a United States declaration of war on the country or a publicly issued statement by the Secretary [of the Treasury] that the country is no longer officially dollarized …" (Section 6).

The declaration-of-war clause underscores the nexus between money and power. Countries that are considering the adoption of the dollar as their legal tender cannot ignore the possibility that their monetary systems may be disrupted by the United States in times of conflict. It happened to Noriega's Panama in March of 1988, when the U.S. government put a payment squeeze on the country. Banks were closed for two months and Panamanian real GDP suffered a sharp drop (Moreno-Villalaz, 1999). These factors may explain why fully dollarized economies tend to be small. What country of the size of Argentina or Brazil would acquiesce politically to a clause that its monetary system would be under potential threat of a foreign government?

The second point is that multilateral MUs are much more complex than unilateral MUs and require, to function properly, a high degree of inter-state cooperation (Cohen, 1993) and fiscal redistribution (Kenen, 1969). It is exactly these aspects that give rise to the prediction that multilateral MUs cannot be stable without ultimately becoming fiscal or political unions. Thus, in an expectational sense, the East Caribbean Currency Area, the West African Monetary Union, the Central African Monetary Union, and EMU imply a long-run reduction in the number of countries, leaving the equilibrium ratio of independent currencies to countries unchanged.

3.2. The Trade-Money Causality

Let me return to Rose's (2000) – and mine – large empirical effect of MU on trade. This finding has been met with some skepticism. For Persson (2001), the countries in Rose's MU group are much too different in terms of income, dimension, and geographical proximity from the countries in the control group. Just like in medical experiments, the treated group must be made homogenous with respect to the control group. After rebalancing the two groups, Persson re-estimated Rose's gravity equation and obtained much lower estimates of the common currency coefficient and much higher standard errors. A similar, but narrower, objection has been raised by Mélitz (2004) who found that the selection bias of the MU group stems from the fact that these countries share close trade relations and political affinity. Using the same data, Mélitz disentangled RTA and political union effects from MU effects and arrived at a lower impact of MU on trade. For Pakko and Wall (2001), the problem with Rose's results stems from the estimation technique. Countries differ in so many ways that it is impossible to capture all differences by expanding the list of F in Eq. (1). Pakko and Wall advocate the specification of fixed effects to correct the bias that may arise from omitted variables. When they re-estimated the model using the same Rose's (2000) sample, the impact of common currency on trade was statistically not different from zero. Glick and Rose (2002) re-estimated the gravity equation with fixed effects but on a larger data set (1948–1997) than Rose (2000) and more observations of switches in and out of MUs, and found that the common-currency coefficient was approximately half of the estimated value obtained from pooled data.

In sum, the endogenous OCA literature focuses on the role of MU as a catalyst of "real" integration, in contrast to the passive role of money assigned by the traditional OCA literature. This idea finds more favor than the quantitative impact of monetary unification on trade flows. The state of the art is that the estimate of the common-currency coefficient is sensitive to sample and empirical methodology. Also, my estimates of a common-currency effect on bilateral trade vary materially between common-border countries and other countries. As to borders, we recall that sustainable multilateral MUs require a permanent modification of the national border in the sense of a fiscal and/or political unification. The border is the real exogenous force in the expansion of multilateral MUs.

4. SUMMARY AND CONCLUSIONS

This paper has dealt with the constraints that national and regional borders place on the international integration of goods, services, capital, and monies. Despite the clamor of anti-globalists, the world is far from being an integrated village. It took us almost a 100 years to regain the degree of integration that existed during the gold standard. Integration today remains imperfect because national borders translate into trading costs, including differences in monetary regimes. Political borders shelter many goods and services from external competition and, consequently, represent a critical exogenous force in the integration process.

Borders are thicker for the small countries than the large countries and adjust to the inter-play of bilateral and multilateral trading costs. Not surprisingly, it is small countries that tend to be the most favorable to a liberal trade system. The trend of regionalism has softened or, in some cases, pushed outward national borders, and in the process has created new biases. Not only is there more trade inside RTAs than across RTAs, but integration differs across different regions of the world.

The significance of the border goes beyond goods and services. It affects physical and finance capital as well. Physical capital is more mobile within the regions of a country than across countries, and the same is true for finance capital. Finance capital is more mobile than physical capital. Financial integration in RTAs like the EU is higher than global integration. As it is true for trade, national borders are a constraint to the expansion of the financial economy; regional arrangements have expanded national borders and created borders of their own.

After World War I virtually each country had its own fiduciary money and restrained currency substitution. Monies went in unison with flags and airlines. The speed of financial integration seems to call for massive currency consolidation. Yet, the record shows that, except for small cases of unilateral MUs, significant reductions in the number of currencies have occurred through the formation of multilateral MUs, such as the East Caribbean Currency Union, the West African Monetary Union, the Central African Monetary Union, and the EMU. Since multilateral MUs cannot be stable without ultimately becoming fiscal or political unions, it is not clear whether financial integration will ultimately reduce the ratio of independent monies to sovereign nations.

NOTES

1. Eq. (1) is the same as the GE derived by Bergstrand (1989, Eq. (1)), except for the fact that Bergstrand's is expressed in nominal rather than in real terms; it is the same equation used, among others, by Rose (2000, 2003, 2004).
2. Frankel (1997, Chapter 5), among others, presents evidence of regional trade bias.
3. For a review of this literature, see Soloaga and Winters (2001). We do not present region-specific trade-creation and trade-diversion effects. However, according to the empirical results by Wei and Frankel (1997, Table 1), ASEAN, East Asia (excluding ASEAN), and MERCOSUR have statistically significant positive intra- and extra-bloc coefficients. These RTAs appear to have liberalized, not only internally, but also vis-à-vis the rest of the world and consequently have helped multilateralism. For EFTA and NAFTA, on the other hand, the intra-bloc dummy is positive and the extra-bloc dummy is negative, evidence that is consistent with these two RTAs having created a positive internal trade effect but a negative external one. Here, regionalism is not consistent with multilateralism. Finally, for the EU the intra-bloc dummy is negative and the extra-bloc dummy is positive, suggesting that this RTA has generated a negative internal trade effect but a positive external one.
4. The dispersion is much higher in sectors that have significant product differentiation (e.g., ladies apparel and footwear) than in sectors that sell relatively homogeneous products (e.g., food and alcoholic beverages); see Table 2 in Engel and Rogers (1996).
5. Whether capital mobility is higher or lower now than during the gold standard depends to a large extent on whether one measures net or gross capital flows. Net capital flows as a proportion of GDP were higher during the gold standard, whereas gross capital flows are higher today. Bordo, Eichengreen, and Irwin argue that today's capital flows have a much broader reach, in terms of sectors, than in the late 19th century.
6. Uncovered interest rate parity can be stated as follows: $i - i^* = (i - i^f) + (i^f - i^*)$, where the new symbol i^f is the holding-period yield of a security with similar characteristics as the other two securities, issued by the home government and denominated in foreign currency (say U.S. dollar). The term $(i - i^f)$ captures the expected depreciation of the home currency with respect to the foreign currency, whereas the term $(i^f - i^*)$ captures the difference between the default risk on the home and foreign security as well as the expected value of future changes in the characteristics of the home security; that is, country risk.

7. There is a long list of financial assets whose prices differ significantly across countries. For example, von Furstenberg (1998) reviews the evidence on the estimated cost of capital in the United States and Japan and insurance premia in countries of the EU. In both cases, differences are too wide to be explained by differences in tax rates.

8. The uncertainty problem can be gleaned from the data reported by Lewis (1999, Table 2) on the sample means and standard deviation of the annualized monthly dollar returns of the U.S. stock market and the EAFE index (the "foreign" stock market) for the period 1970–1996. The foreign stock market average return of 12.12% exceeded by almost one percentage point of the U.S. stock market return of 11.14%. However, given that the standard deviations of the foreign and U.S. stock market were 16.85 and 15.07, respectively, one cannot reject the null of mean equality.

9. The Act was introduced by Senator Connie Mack in the U.S. Senate (S. 1879) on November 8, 1999 and by Representative Paul Ryan in the House of Representatives (H.R. 3493) on November 18, 1999. Hearings were held on the Act, but legislation was not enacted (Schuler & Stein, 2000, p. 2).

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CHAPTER 3

REGIONAL TRADE AGREEMENTS

Richard Pomfret

ABSTRACT

This chapter reviews the evolution of thinking about regional trade agreements (RTAs) and the policy developments reflected in three waves of RTAs during the last half century. Desirable and undesirable features of RTAs can be identified, but the central message concerns the ambiguity of outcomes. The chapter concludes with a discussion of the role of the nation state and of multilateral institutions and the scope for intermediate levels of organization created by RTAs.

Regional trade agreements (RTAs) have been a major and recurring feature of the global economy during the last half-century. The evolution of thinking about such agreements has tracked the policy developments. The first wave of regionalism, led by the western European customs union, which followed the 1957 Treaty of Rome, was analysed within the framework of Vinerian customs union theory. The second wave, which was characterized by agreements in the 1980s going beyond preferential tariff reduction towards deeper integration, was considered to be a "New Regionalism" requiring new tools. The third wave of bilateral agreements in the early 2000s continues many of the trends towards deeper integration, although it is in some respects hardly even regionalism.

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This chapter first briefly describes the three waves of regionalism. It then reviews customs union theory and the analysis of deep integration. In both of these approaches to RTAs, the nation state is the basic unit of analysis. The fourth section goes into the question of the appropriate level of analysis for the global economy; are the roles of the nation state and of multilateral institutions evolving in the twenty-first century, and what scope will exist for the intermediate units formed by RTAs? The final section draws some conclusions.

1. THE THREE WAVES OF REGIONALISM

Since the signing of the General Agreement on Tariffs and Trade (GATT) in 1947, three waves of regionalism have swept the world trading system. During the 1950s and 1960s the "rush to discrimination" was led by Western Europe, which founded the only new substantial customs union in the second half of the twentieth century and also established a complex network of preferential arrangements with other trade partners.[1] The European customs union was taken as a model by groups of developing countries in Africa, the Caribbean, Central America and South America, but even the most promising of these arrangements, the East African Community and the Central American Common Market, collapsed during the 1970s.[2] The customs unions agreed among the developing countries, all failed because they were based on a regional form of import substitution, which inevitably led to conflict, because each member wanted a regional market for its own inefficient industries, but was unwilling to buy the expensive or poor quality import-substitutes being produced by their partners. The European customs union had similar strains, but for most goods (except farm products) the least-cost supplier within the union was globally competitive, and the political will for greater economic union outweighed perceived costs even for large net economic losers such as the United Kingdom, which joined in 1973.

A second wave of regionalism was initiated by the United States' departure from the GATT non-discrimination principle in the first half of the 1980s and peaked with the North American Free Trade Agreement (NAFTA) negotiations in the early 1990s, which coincided with the European Union's 1992 project for completing the internal EU market. Although NAFTA was signed and implemented, the EU completed its 1992 program and Australia and New Zealand deepened their free trade area into the Closer Economic Relations (CER), the major trading nations reaffirmed their commitment to the non-discrimination principle with the successful conclusion of the 1986–1994 Uruguay Round of multilateral trade negotiations and the establishment in 1995 of the World Trade Organization (WTO) as the successor to the GATT. As in the first wave, there was a demonstration effect as groups of developing countries worried about the need to establish and strengthen their own regional groupings. The geographical scope was wider than in the first wave as Latin American regional arrangements such as Mercosur and African customs union in various overlapping incarnations were joined by Asian regional organizations. The practical outcomes of these follower RTAs were, however, minimal for much the same reasons as in the first wave; each partner was unwilling to grant other partners non-trivial preferential access to its own protected markets.[3]

In the opening years of the twenty-first century, a third wave of RTAs has been gathering force, led by Asian countries, which had previously been the strongest bulwarks of non-discrimination. The emergence of Asian regionalism can be dated from the aftermath of the 1997 Asian Crisis, and was partly in reaction to dissatisfaction with the role of the Bretton Woods institutions. The earliest manifestations were in calls for an Asian Monetary Fund or even monetary union, although this led only to the 2000 Chiang Mai Initiative, which provided (limited) stand-by swap facilities for countries facing currency crises (Pomfret, 2005a). However, the collapse of the 1999 WTO meetings in Seattle and the diminishing significance of Asia-Pacific Economic Cooperation (APEC) led to calls for new approaches to trade liberalization in the Asia–Pacific region. Bilateral negotiations were begun in 1999/2000 by Japan with Singapore, South Korea, Canada and Mexico, by South Korea with Chile and New Zealand as well as with Japan, and by Singapore with New Zealand, Australia, the USA, Canada and other countries. In their embracing of bilateral agreements, the Asian countries were joined, especially under the G.W. Bush administration, by the U.S., which started to negotiate bilateral trade pacts with friendly countries such as Jordan, Morocco and Australia. As is obvious from these examples, although the third wave is seen as a recrudescence of regionalism, many of the bilaterals are not regional.[4] It is also not clear, how novel the pattern is; bilateral agreements have long existed in areas such as double-taxation or investment treaties, without being labelled as a type of RTA.

Whether regional/bilateral agreements are becoming a major feature of the global trading system (as opposed to a major preoccupation of trade negotiators) is not obvious. It is sometimes asserted that, because the number of RTAs reported to the WTO reached an all-time high in the early

2000s, regionalism was more prevalent than ever. Crawford and Fiorentino (2005) in the opening paragraph of their survey of RTAs state that "Between January 2004 and February 2005 alone, 43 RTAs have been reported to the WTO, making this the most prolific RTA period in recorded history." Such counting is nonsense, because some arrangements are important but many are inconsequential. One reason for the rapid increase in the number of RTAs during the 1990s was the proliferation of bilateral and plurilateral free trade agreements among countries of the former Council for Mutual Economic Assistance; these were primarily a response to regional disintegration, rather than a trend towards regionalism in Central and Eastern Europe. On 1st May 2004 when eight eastern European countries joined the EU, the web of bilateral trading arrangements among the accession countries and of preferential agreements between the accession countries and the EU became redundant, although with the incorporation of eight more countries into the EU customs union the degree of regionalism was increased. According to Crawford and Fiorentino (2005, n. 21) 65 RTAs reported to the WTO were abrogated on that date, so that by their own measure net RTA formation between January 2004 and February 2005 was −22, i.e. 2004 saw the biggest retreat from RTAs in recorded history.[5]

The problems of simple counting are highlighted by examination of the 20 RTAs reported to the WTO in the first half of 2005; see Table 10 of the Technical Appendix at the end of the volume. Six were bilaterals (Australia–Thailand, Japan–Mexico and Panama–El Salvador) which were double-counted because they are under GATT Article XXIV and General Agreement on Trade in Services (GATS) Article V. Twelve were bilaterals involving pairs of eastern European countries (mostly among regions of former Yugoslavia, i.e. reflecting regional disintegration). The other two were an EFTA–Tunisia agreement and an Israel–Romania agreement.[6] None of these 20 agreements can be expected to have a significant impact on world trade or even on the trade of the signatories. This is, of course, not to argue that no RTAs are important – the EU, NAFTA, Mercosur and some others obviously are – but it is to caution against simplistic claims of proliferating regionalism in world trade.[7]

In contrast, it is arguable that, despite the increased attention being paid to regional arrangements, the hold of multilateralism is stronger than ever as practically all trading nations have now acceded to the WTO, with lower trade barriers and stronger trade dispute settlement procedures than ever before. Perceptions of WTO enfeeblement reflect a tendency of news reporting to highlight the conflict rather than accord. The end of the Multifibre Arrangement in December 2004 was a monumental step in global non-discriminatory trade liberalization, which is surely good for global resource allocation and for people who wear clothes, but the press coverage in early 2005 highlighted negative effects on countries suffering from preference erosion (such as Bangladesh) and the impact on producers in powerful nations. Even as the U.S. and EU were negotiating safeguard measures against the surge of clothing imports from China, little mention was made of the fact that these were legal under China's WTO accession accord but limited in duration to 2008. Other striking examples of the increased rule of law in international trade since the creation of the WTO are the ability of small countries to win cases against major trading nations (and have the offending policies modified) and the willingness of the U.S. Congress to amend U.S. tax law (on FISCs) to comply with a WTO judgment.

2. THE ECONOMICS OF PREFERENTIAL TRADE POLICIES

Regional trading arrangements (RTAs) are often described by the five levels of integration set out by Bela Balassa (1961).

- preferential trading arrangement (PTA),
- free trade area (PTA with zero internal tariffs),
- customs union (free trade agreement (FTA) + common external trade policy),
- common market (customs union (CU) + free movement of factors of production), and
- economic union (common market (CM) + common economic policies).

The five categories are often treated as a sequencing pattern towards closer integration as well as taxonomy of deeper and deeper integration.[8] The defining feature of all of these RTAs is that trade among members is treated differently than trade with non-members.

Such preferential trading arrangements are permitted under the GATT/WTO rules, notably under Article XXIV on customs unions and free trade areas (and the parallel Article V of the GATS) and under the Enabling Clause for special treatment for developing countries. They are, however, contrary to the spirit of the GATT, embodied in Article I, which requires any GATT signatory to treat all other signatories equally, and Article XXIV contains stringent conditions, which have seldom, if ever, been fully met in practice. There is also a paradox between the political economy forces encouraging politicians to embark on preferential trade policies and the economic forces working in favour of global adherence to the non-discrimination principle. Despite dozens of plans for RTAs many failed to come to fruition, and among those RTAs that did begin to operate many failed to survive long or to exercise a significant influence on trade flows.[9]

The ambiguity in trade law captures the classic insight by Jacob Viner (1950) that any discriminatory trade policy, such as a customs union, is by its nature second-best. One distortion, the differential treatment between a member's domestic products and products from other member countries of the customs union, is removed and this permits a more efficient allocation of resources if imports from the partner replace domestic production or increase domestic consumption. At the same time, a new distortion is introduced between imports from the member and non-member countries, which were previously treated equally, and this can lead to inefficient diversion of trade from the least-cost global producer to a partner country, which is less efficient but has an artificial price edge due to the preferential tariff. The trade creation and trade diversion effects of customs union accession work in opposite directions to leave the direction of change in welfare of the country joining a customs union, and of the world, theoretically ambiguous.

Thus, although a discriminatory tariff reduction, as in a customs union or free trade area, may be welfare-improving, the presumption is that, with competitive markets, the removal of trade barriers on a non-discriminatory basis would be first-best (Johnson, 1965; Cooper & Massell, 1965). Politicians are often attracted to regional trading agreements for political reasons, but Viner's analysis explains why economic forces work against such arrangements in practice. The many RTAs involving developing countries broke down because each member might have liked trade to be diverted in favour of its own inefficient manufacturing enterprises, but did not want to bear the trade diversion costs of importing from its partners' inefficient industries. If RTAs survived, then there was a suspicion that they involved some cost to third countries, e.g. through terms of trade effects in favour of the union members, and this justifies the sceptical position vis-à-vis RTAs in the GATT.

A more positive attitude towards RTAs emerges if they are viewed as stepping-stones to multilateral trade liberalization. Kemp and Wan (1976) showed that, if signatories of a preferential trading arrangement are required to ensure that no third country suffers a welfare loss, then there always exist welfare-improving PTAs and the process of forming such groupings will continue until all tariffs are zero. This proposition, however, requires members of a RTA to pay attention to the welfare of non-members and it ignores negotiating costs.

Although Balassa's taxonomy is sometimes seen as a sequence towards closer economic union, the decision to form an FTA or CU seems to be a choice rather than a sequence. An FTA is easier to negotiate, because it does not require agreement on a common external policy or on how to share tariff revenue.[10] An FTA, however, suffers from the problem of trade deflection. Direct trade deflection, i.e. third-countries routing their supplies through the low-tariff member country as a point of entry into the FTA even when the final destination is a high-tariff member, can be averted by setting rules of origin (RoOs). If the low-tariff country has a substantial domestic production, then RoOs may not prevent indirect trade deflection, whereby the external imports go the low-tariff country while that country's own producers export to the high tariff (and therefore high-price) member country. The outcome is a race to the bottom, because the low-tariff country collects all of the FTA's tariff revenue while the high-tariff country does not even obtain the intended protection for its producers.[11] Thus, true FTAs are rare, although the term has been hijacked and applied to RTAs that are not CUs.

3. THE "NEW REGIONALISM" AND DEEP INTEGRATION

A novel feature of RTAs of the 1980s such as the Australia–New Zealand Closer Economic Relations, the U.S.–Canada Free Trade Agreement or the EU enlargements, was that they involved countries with fairly low tariffs. Vinerian trade creation or trade diversion was likely to have small welfare implications, which raises the question of why such RTAs were formed. Supporters of the deeper EU, NAFTA or the CER argued that these were new forms of regionalism going into areas where the Vinerian analysis was inapplicable, such as increasing-returns industries, policy harmonization or service activities.[12]

Most economies have policies to limit the creation or abuse of monopoly power. They differ in name (anti-trust, restrictive practices, anti-monopoly, competition policy, etc.), and also differ in content and application. Content varies primarily due to differing views on the appropriate trade-off between permitting efficient realization of economies of scale and limiting the market power, which large enterprises are likely to have. Lax implementation may reflect "capture" of the regulators by the people they are supposed to be regulating or lack of resources devoted to the regulatory authority. The issue for regional integration was illustrated when the EU was moving towards deeper integration in the 1980s. Members with tougher competition policies felt that firms from countries with laxer competition policies had a competitive edge, because monopoly profits at home could cover their fixed costs, enabling them to have lower marginal costs and hence be able to price more aggressively in other EU markets. This could initiate a race to the bottom, but that would allow undesirable abuse of monopoly power across the EU internal market, so the preferred solution was to negotiate a common competition policy.

Policy harmonization applies to many other areas. Non-tariff barriers hamper regional integration, and in many cases are used by producers to segment markets in order to enjoy local monopoly power. Major steps in creating the EU internal market involved establishing principles of mutual recognition and disallowing minor variations in safety, health or environment standards, although this has led to tedious case-by-case judgments. The landmark Cassis de Dijon case, in which a German law requiring liqueurs to have a minimum 32% alcohol content was found to have no public health justification, established that goods could not be redefined when they entered another EU country. Similarly, the German *Reinheitsgebot*, which set standards for beer purity, was declared an inadmissible non-tariff barrier. The specificity of judgments is, however, reflected in a case brought against a Danish law on reusable beer and soft drinks bottles, which non-Danish beer producers argued was a restriction on the free internal market, but which the EU allowed to continue as a justifiable environmental protection measure.

As border measures such as tariffs and non-tariff barriers to trade diminish, the significance of other trade costs becomes more apparent (Anderson & van Wincoop, 2004). If the behind-the-border costs vary from country to country, then the trade playing field is not flat. Foreigners will find greater difficulty in penetrating the market of a country that has poorly developed infrastructure, financial sector and other support services. This concept of unfairness has been most often voiced by the U.S., which sees its home market as easier to supply than other countries' markets, and hence U.S. exporters and import-competing producers are at a competitive disadvantage. Similar market opening pressures became a feature of the EU's market deepening, especially with respect to financial services after the last national-level capital controls were removed in the early 1990s. The third wave bilateral trade agreements often include measures of financial sector liberalization, especially when pushed by the U.S. or Singapore whose home financial sectors are relatively efficient.

A disadvantage of the second and third wave RTAs is that their increased complexity means that interest groups, who are well informed about a particular sector, may become involved in design of the agreement and may shape the RTA to their own, but not necessarily the national, benefit. In the Vinerian analysis, trade diversion is often more politically acceptable than trade creation because the losers from trade diversion (domestic taxpayers and non-preferred foreign suppliers) have little impact on the policy-making process, whereas the costs from trade creation are born by domestic producer interests, who are typically better organized and more powerful in shaping policy. Thus, there is a potential trade-diverting bias in CU or FTA design, which is one justification for the GATT/WTO requirement that an FTA or CU should cover virtually all trade so that countries cannot customize RTAs to include only sectors where trade diversion is more likely.[13] With deeper integration the exclusions may be less transparent. In NAFTA, the RoOs have been used especially for textiles and apparel and for automobiles to favour trade diversion. More broadly, the very detailed RoOs in NAFTA serve to manage trade, often to the benefit of specific U.S. firms, while as a tax on intermediate inputs the RoOs' global impact is presumed to be negative (Krueger, 1999).[14] The extension to service sectors in deep integration arrangements almost inevitably increases the opportunity for rent seeking, because most service providers are governed by regulations which may be desirable, but which also offer the opportunity to erect discriminatory barriers to trade.[15]

Despite the novel features of the third wave of regionalism, the thrust of the analysis of the first two waves remains valid. Even in the new areas, multilateral non-discriminatory trade liberalization is usually the best approach not only from a cosmopolitan global perspective, but also often for the net economic welfare of the participants in potential regional arrangements.[16] The lack of transparency and the selective coverage of second- and third-wave RTAs make it more likely, given the political economy of trade policy, that trade-creating opportunities will be passed over because they hurt domestic producers while trade diversion will be permitted. Such selectivity might facilitate reaching agreement on a RTA, but, as happened with most of the first-wave RTAs, it will undermine the sustainability of the new bilaterals.

4. RETHINKING THE LEVEL OF ANALYSIS

Deep integration, or the final level in Balassa's taxonomy (economic union), poses an analytical problem. At what stage does a RTA become a nation state? We no longer think of the German, Italian, Canadian or Australian customs unions as RTAs, because the CU element was subsumed in nation-state formation. Today, the EU is not a nation state, but in some international organizations it has a single voice (e.g. the WTO); at what point should the EU be treated as a single unit in the global economy?

What determines the size of nations? Alesina, Spolaore, and Wacziarg (2000) argue that the number of nations is endogenous to the state of the global economy. The optimal size of a nation depends upon the marginal benefits of size (e.g. ability to provide public goods, such as national security, which are characterized by scale economies) and the marginal costs of size (e.g. increased difficulty in reaching agreement on national policies). One of the benefits of size is a larger domestic market, but this is less important in a global economy characterized by low barriers to international trade.[17] Other things equal, in a more open global economy the optimal size of a nation is smaller and there will be more nations. As evidence in support of the hypothesis that the global trade regime matters, Alesina, Spolaore and Wacziarg contrast the 1920s and 1930s, when trade barriers were high and there was no increase in the number of nations, with the GATT/WTO era, when substantial decline in average tariffs was accompanied by an increase in the number of nations from about 70 to over 200.

Others view the proliferation of small states as part of a challenge to the primacy of the nation state in the global economic system. During the 1960s and 1970s the major economies realized that they had to accept limits on their monetary policy independence if they wanted to have efficient global capital markets and exchange rate stability. This trade-off has played out in other areas where the demands of an efficient global economy imply restrictions on national policy autonomy. Rodrik (2000), in a review of the global economy over the period 2000–2099, foresees the rise of global federalism as the most important trend, driven by the need to reconcile the pressure for global policies with democratic control.

A more general view of this process is captured by the term "subsidiarity", i.e. each policy should be dealt with at the lowest efficient level of decision-making. Some policies are more efficiently determined at a local level, e.g. refuse disposal or zoning laws, while others are best done at a global level, e.g. world trade law or the law of the sea, and the rest are best done at a variety of intermediate levels (regional, national, provincial, etc.). This process is most advanced in the EU, where national governments have simultaneously ceded some policy autonomy to the EU and some policy autonomy to sub-national regions such as Scotland, Catalonia or Brittany. In general, the move from a centralized state to forms of fiscal federalism is positively related to the level of per capita income (Arzaghi & Henderson, 2005).

A positive building block argument for regional agreements is that they can be testing grounds for international policies in new areas, although turning a policy designed by a few countries into a global institution may arouse fears of it being moulded to the designers' interests.[18] An alternative building block argument is to recognize that regional agreement in a controversial new area may be easier than global agreement; the EU's harmonization of competition policy illustrated the difficulty of reaching agreement even among countries with fairly similar economic structures.

Although RTAs focussing on non-tariff issues may become a feature of the global economy in future, it is important to emphasize that the process is at an embryonic stage. The empirical evidence in favour of the use of the nation state as the basic unit in international economics is strong. Even in the highly integrated North American market, Canadian trade exhibits a surprisingly large home-country bias. This was highlighted by John McCallum (1995), who found a large border effect in a gravity model analysis of trade among Canadian provinces and U.S. states, and by Engel and Rogers (1996) who found a large border effect in analysing price variation across nine Canadian and 14 U.S. cities; see Chapter 2. In both studies distance matters, whether in determining trade flows or price arbitrage, but there is a huge discontinuity when the national border is crossed, even when it is an open border between two economies with low trade barriers and to some degree similar cultures. McCallum graphically compared the volume of trade between Ontario and British Columbia with that between Ontario and California; although the Californian economy is much larger than that of BC and roughly equidistant from Ontario, Ontario trades much more with BC. The magnitude of McCallum's border effect has been questioned by Anderson and van Wincoop (2003), who also argue that a border effect is far more significant for the large country (the USA) than for the smaller country (Canada), but the presence of a U.S.–Canada border effect seems incontrovertible.

Market forces may override a border effect even in the absence of a formal RTA. In North America, close relations between San Diego and Tijuana and other border pairs predated NAFTA, and there is also a Great Lakes industrial region in which southern Ontario is more closely linked to south–east Michigan than to other parts of Canada (in contrast to McCallum's continent-wide finding). In East Asia, Sijori (Singapore–Johor–Riau) and the Pearl River Delta have been identified as sub-regional economic zones, which incorporate parts of neighbouring countries. In both these cases the process of regional integration involves parts of some countries, not the entire nation, and it is market-driven rather than a result of formal agreements.[19]

5. CONCLUSIONS

The theory and practice of RTAs have evolved considerably over the last half century. Viner's analysis remains relevant to any discriminatory arrangement including RTAs, which is based on preferential tariffs or, with modifications depending on the specific measure, to non-tariff barriers imposed on a preferential basis. Attempts to form seriously discriminating RTAs have foundered in Latin America and Africa, and failed to get off the ground in Asia, largely because policy makers did not want to bear the trade diversion costs of importing from inefficient producers in partner countries. The most salient RTAs in the current world economy (the European Union, the North American Free Trade Area or Closer Economic Relations between Australia and New Zealand) all have liberal external trade policies, so that they could properly be called regional arrangements for matters beyond trade.

In a world where tariffs and simple non-tariff trade barriers have diminished, other trade costs come to the fore, and as markets become more regionally or globally integrated there are increasing pressures for harmonization in a greater number of policy areas. In this process, regional arrangements have a role to play as some policy regimes may desirably be supra-national but sub-global. Regional arrangements may also be testing grounds for innovations in policy coordination or harmonization, and hence act as building blocks towards identifying well-designed global policies. On the other hand, the increased complexity of regional arrangements which cover such areas opens up opportunities for managed trade that can benefit insiders and become a stumbling block to progress at the global level.[20]

NOTES

1. The quotation is from Gardner Patterson (1966). The European Community's preferential trading arrangements (PTAs) with non-members were in many respects a substitute for the missing common foreign policy (some were preludes to membership, others such as the Yaoundé/Lomé/Cotonou Conventions retained special relationships with former colonies and similar African, Caribbean and Pacific economies). These PTAs contributed to the U.S. abandonment of the non-discrimination principle, when it signed its own PTAs with favoured clients in the Caribbean and Israel, and to poor countries' opposition to multilateral trade liberalization, which may erode their preferences' value, but in themselves they are not of great significance for the global trading system.
2. The various RTAs mentioned in this chapter are described and analysed more fully in Pomfret (1997).

3. The Asian RTAs were especially ineffective. The two largest economies in the South Asian Association for Regional Cooperation (SAARC), India and Pakistan, withheld MFN treatment from one another. The Economic Cooperation Organization (ECO) was in abeyance while Iran was at war with Iraq. Most empirical studies find minimal effects on trade for SAARC or ECO, and even for the Association of Southeast Asian Nations (ASEAN), which was the least moribund of the Asian RTAs.

4. When Thailand under Thaksin, for example, embarked on a policy of negotiating bilateral trade agreements, it began with Bahrain and Australia before moving on to the U.S. and Japan; this pattern is weakening Thailand's regional trading arrangements by eroding preferential treatment negotiated within ASEAN. South Korea's experimentation with bilaterals started with Chile and New Zealand, willing collocutors, but hardly regional neighbours and never likely to generate large bilateral trade flows.

5. The precise number may be disputed but the order of magnitude is clear. According to the World Bank (2005, p. 53), the number of RTAs fell from 285 to 229 as a result of the EU enlargement in 2004.

6. The European Free Trade Association (EFTA) consists of Iceland, Liechtenstein, Norway and Switzerland.

7. Much of the confusion about the number of RTAs derives from the WTOs website, which includes a dramatically rising but effectively meaningless chart of the cumulative number of RTAs registered with the WTO since 1948. Despite the statement in the accompanying text that "Not all RTAs notified in the last half century are still in force today," no account is taken of abrogation or non-implementation and the visual impact is of rampant regionalism. The same chart appears as Chart 1 in the discussion paper (Crawford & Fiorentino, 2005) linked to the WTO web page on the prevalence of RTAs; although the paper contains an official disclaimer, the authors are staff of the WTO Secretariat. The WTO has a duty of transparency when RTAs are reported but it should also provide reasoned commentary rather than scaremongering about the threat of regionalism.

8. A debate in East Asia, which has been particularly strong since the 1997 Asian Crisis, is whether the sequence can be reversed with monetary integration being used as a stimulus for trade integration (Pomfret, 2005a).

9. Many regional agreements are intended to demonstrate special friendship. Especially at regional or bilateral summit meetings between autocratic leaders, who have few foreign policy instruments, a bilateral or plurilateral trade agreement is a popular outcome. This has been especially apparent in the former Soviet Union, where Presidents have announced a large number of RTAs, which have been allowed to lapse before they were implemented or were abandoned as political allegiances shifted (Pomfret, 2005c).

10. A CU may require agreement on revenue sharing because the collection of customs duties under the common external tariff is not equitably distributed across countries, e.g. in the EU Rotterdam's significance as a port means that many imports to northern Europe enter through the Netherlands even if their final destination is, for example, Germany.

11. Many authors (e.g. Crawford & Fiorentino, 2005, p. 17) state that RoOs can prevent trade deflection, but that is only true as a general statement if trade deflection is defined to include only direct trade deflection. Where tariffs are low, intra-FTA transport costs are high or products are differentiated (as in, for example, EFTA),

then indirect trade deflection is less likely, although when it does occur there will be a deadweight welfare loss due to augmented transport costs. For analysis of trade deflection, see Pomfret (1997, pp. 185–188).

12. The term deeper integration to capture regional agreements in these new areas was popularized by Robert Lawrence (1996). A survey of the evolution of thinking on RTAs during the 1990s is provided by Panagariya (2000).

13. Despite the restriction in GATT Article XXIV, European producers managed for several decades to ensure through the use of non-tariff measures that the preference margins were especially high on agriculture, textiles and clothing, cars and steel – all sectors, where trade diversion was likely to exceed trade creation.

14. The 900 plus pages required to document the NAFTA illustrate the earlier point that many RTAs described as FTAs do not fit the formal definition of a free trade area, which would require a very simple agreement to abolish tariffs on internal trade. This applies to all of the so-called free trade areas in Table 10 of the Technical Appendix at the end of the volume.

15. Messerlin (2005) cites the example of the high-level French lobbying to exclude bailiffs, notaries and barristers to the Supreme Courts from the EU Directive on Services.

16. This chapter does not address monetary integration, but a similar generalization about the economic benefits of a single money applies, subject to caveats about the optimal administration of monetary policy; see Pomfret (2005b), and the chapters in this volume by Grubel and by Fratianni.

17. Alesina and Spolaore (2005) analyse the relationship between the benefits of size in the provision of national security and the likelihood of war, arguing that a better defined global security regime encourages country break-up (i.e. an increase in the number of nations) but also leads to numerous local conflicts.

18. The ill-fated multilateral investment agreement designed by the Organization for Economic Cooperation and Development (OECD) is perhaps an example. The low and middle-income countries were never likely to accept a global regime on foreign investment designed by the rich countries that were the home of most transnational corporations.

19. This alternative view of the role of distance arises from the New Location Theory (Krugman, 1991; Fujita, Krugman, & Venables, 2002) in which the existence of cities implies some scale economies. When such agglomeration effects spill across borders, the phenomenon is often referred to as a sub-regional economic zone (Pomfret, 1996).

20. The stumbling block case has been most forcefully argued by Jagdish Bhagwati, and in joint contributions by Bhagwati and Panagariya (1996). Bhagwati emphasizes the negative systemic consequences of eroding the non-discrimination principle. Estevadeordal and Suominen (2003), whose catalogue of RoOs shows them to be often product-specific and rarely consistent from one RTA to another, conclude that failure to harmonize RoOs exacerbates hub-and-spoke relationships and is an obstacle to freer global trade. Özden and Reinhardt (2005) provide empirical evidence, based on eligibility for favourable treatment under the Generalized System of Preferences for developing countries, that preferential access to export markets is associated with less liberal trade policies towards imports. There is also evidence in the Doha Round negotiations that countries benefiting from preferential market access for important exports are opposed to multilateral trade liberalization by their trading partners because that will erode their margin of preference.

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CHAPTER 4

THE ECONOMICS OF MONETARY UNIONS: TRADITIONAL AND NEW

Herbert Grubel

ABSTRACT

The paper discusses recent changes in conventional wisdom about the optimality of fixed and flexible exchange rates. It develops the important difference between traditional and hard currency fixing. The main part of the paper analyzes the traditional benefits and costs of fixed currencies, how they are changed by first modifications of and second fundamental challenges to the Keynesian paradigm. The last part reviews empirical finding that fixed currencies hard currency fixing leads to a higher economic growth.

The creation of monetary unions has been discussed widely among academics and policy makers in recent years. The prospects for the European Monetary Union long dominated the discussions, but studies have also been made of possible regional monetary unions in North America: Canada, the United States (see Grubel, 1999, 2000) and Mexico, the Caribbean Islands, Central America, the Southern Cone of South America, Australia and New Zealand, French-speaking countries of Africa, South African countries and East Asian countries and others.

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The next section briefly puts the current interest in such unions into the context of the ever-changing conventional wisdom on the best institutional exchange rate arrangements for individual countries. The subsequent section discusses the institutional arrangement available for the creation of monetary unions. This is followed by the presentation of the traditional optimum currency area arguments and some mitigations of the costs found in the traditional literature. The next part analyzes two important theoretical and empirical modifications of the traditional theory. The paper closes with a summary and conclusions for economic policy.

1. THE UPS AND DOWNS OF THE FIXED EXCHANGE RATE SYSTEM

At the end of the 19th century, almost all economists supported the gold standard as the optimal system for linking national currencies. The resultant fixed exchange rates were considered to foster international trade and capital flows and to assure the absence of persistent inflation. This international system worked well and brought great prosperity to all the countries that adhered to it.

The economic dislocations brought on by the First World War ended the gold standard, but the intellectual consensus on the merit of fixed exchange rates remained and attempts were made to restore it among all industrial countries. However, the restoration of the gold standard ran into insuperable problems: the economic dislocations and inflations that accompanied the War, the reparation payments that Germany was required to make in gold (which it did not possess), the Great Depression and most fundamentally, the creation of national central banks that were designed to set national interest rates and to change the domestic money supply.

The creation of central banks had been advocated by a number of economists as a means for dealing with unemployment caused by business cycles and exogenous shocks in ways not possible under the gold standard.

The actions of the central banks before and during the Great Depression of the 1930s were especially damaging to the efforts to restore the gold standard and fixed exchange rates. Friedman and Schwartz (1963) have argued that the unsustainable boom of the 1920s was caused by faulty monetary policies. They argued that such faulty monetary policy also turned the crash of 1929 into the Great Depression.

During the Depression, central banks further hurt the establishment of fixed exchange rates by the deliberate devaluation of currencies in order to reduce unemployment through the creation of a net export surplus. These actions became known as "beggar-thy-neighbor policies" and contributed much to the consensus that the international monetary system to be created after the Second World War must restore a global commitment to fixed exchange rates.

The International Monetary Fund (IMF) created after the end of the War embodied the ideal of fixed exchange rates with the reality that national central banks and separate currencies existed and were to be used to combat unemployment. Under this IMF, system countries committed themselves to a specific fixed, the so-called, parity exchange rate but were allowed to change it with the approval of IMF, if conditions warranted.

This system worked well for a decade or so, but then came under attack from two separate sources. The idea that it is possible to gain lower unemployment by accepting higher rates of inflation (the Phillips-curve trade-off) became popular with politicians and central bankers, but its implementation was stymied by fixed exchange rate commitments.

The second challenge to the system stemmed from the view articulated most powerfully by Milton Friedman (1953) that the exchange rate was nothing but the price of the national currency and could not be fixed without creating the same kinds of problems known to arise from the fixing of the price of a commodity like milk. Sooner or later there would be unsustainable excess supplies or shortages.

As a result of these pressures, the IMF system of fixed but adjustable parity exchange rates was abandoned in the early 1970s. Free from the exchange rate constraint, many important industrial and developing countries engaged in expansionary monetary policies to lower unemployment and stimulate economic growth. The results of these policies were the Great Inflation of the 1970s, commodity shortages and stagflation – the coexistence of inflation and slow economic growth. The problems were serious in all the industrial countries, but also affected severely the economies of important developing countries.

These problems coincided with the publication of economic theories challenging the validity of the Keynesian paradigm and the concept of the Phillips-curve trade-off: the revival of the quantity theory of money (often derogatorily referred to as monetarism), rational expectations and real business cycle theories.[1] As a result of these developments, policy makers once again turned their attention to the goals of price stability and the maintenance of fixed exchange rates.

The consensus on the merit of these policies was also applied to developing countries, which were urged by the IMF to commit themselves to the maintenance of fixed exchange rates, partly in order to provide obstacles to the use of monetary policy by politicians in the pursuit of their own goals.

However, this consensus broke down once again when the outstanding economic performances of several major developing countries using fixed exchange rates were ended by severe financial crises and currency depreciations in the 1990s – in Mexico at the end of 1994, Southeast Asia in 1997, Brazil in 1998 and Argentina in 2001.

For the present purposes of analysis, the proximate and ultimate causes of these financial crises are not important. It is sufficient to note that the IMF switched from encouraging fixed exchange rates to discouraging them. This policy switch is consistent with the widespread reinstatement of the basic Fleming–Mundell theorem,[2] that fixed exchange rates are incompatible with national monetary sovereignty in a world of high international capital mobility.

During all these developments, a separate strain of thinking about fixed versus flexible exchange rates continued to persist. It grew out of Robert Mundell's (1961) critical response to Friedman's (1953) argument that flexible exchange rates are optimal. Mundell asked why, if flexible rates and a national currency are optimal, it would not be good for small states like West Virginia in the United States or regions in other countries to have their own flexible currency? This question about the appropriate domain for a currency was not mentioned in Friedman's original paper and he has since acknowledged its theoretical and empirical significance.[3]

The reason why a West Virginia dollar would not be optimal for the residents of that state is that money is different from other goods and services in the economy in ways which are at the heart of theories about the nature of money. Mundell's insight, which was cited officially in the document conferring on him the Nobel Prize in economics, gave rise to a large body of studies known as the literature on Optimum Currency Areas, which will be reviewed below.

The ever-evolving conventional wisdom on merits of fixed and flexible exchange rates in the early part of the 21st century has reached a stage where both are considered optimal for individual countries, with the choice depending on their economic characteristics. Dominant of these characteristics is country size. Large countries are likely to be better off with flexible exchange rates and smaller countries with fixed rates. Middle-sized countries with close economic relationships would benefit from the adoption of fixed exchange rates among themselves with flexible rates for their monetary union's currency against rest of the world's currencies.

2. ALTERNATIVE METHODS FOR FIXING

The fixing of exchange rates can take two forms: with and without the surrender of national monetary sovereignty. The first policy become known as "hard fixing". This dichotomy is important because past failures of fixed exchange rate were caused by their retention of national monetary sovereignty. The hard fix prevents such failures and allow countries to enjoy all the benefits of a fixed currency.

Hard currency fixing can take place through any one of the following institutional arrangements:

1. The country's own currency is replaced by the U.S. dollar, euro, yuan, yen or other major currency for use in domestic transactions and contracts.
2. The country joins other countries in a formal monetary union and gives up its right to make monetary policy to a common central bank. It adopts the same common currency used by all other countries in the union.
3. The country retains its own currency and commits itself to a currency board arrangement,[4] changing its domestic money supply in a fully specified and automatic response to payments imbalances.
4. It retains its own currency, gives up national monetary sovereignty explicitly by committing itself to the maintenance of convertibility of its currency against the target currency, but is not committed to automatic responses to payments imbalances.

Examples of countries that use these different types of hard currency fixes are as follows. The first arrangement is used in Panama and Ecuador, where U.S. dollars circulate. The euro has seen use in some Balkan countries. The second arrangement involving a common currency, the euro, is used by members of the European Union. The third arrangement has been used in several countries and for different time periods, the most notable of which recently has been in Argentina. Hanke (2002a) provides a list of all countries that presently have or at some time in the past have had currency boards.

The fourth arrangement has been proposed by Courchene and Harris (1999, 2000) and Grubel (2005b) for a hard fix of the Canadian against the U.S. dollar. Under this arrangement as proposed by Grubel, Canada would revalue its currency and create the New Canadian dollar at an exchange rate of one to one to the U.S. dollar. The rate of exchange would be chosen to maintain Canada's competitiveness.

The New Canadian dollar bills would have printed on them the federal government's commitment to exchange one Canadian against one U.S. dollar, on demand. Under these conditions, the New Canadian dollar can be expected to be used in all transactions at par with the U.S. dollar and circulate freely in both countries.[5] The economy would gain the benefits of a permanently fixed exchange rate to be discussed below.

The proposed system of a currency board has the advantage over the system that involves a formal monetary union, since the Government of Canada can adopt it unilaterally.[6] It also has the advantage over the use of the U.S. dollar by allowing Canada to retain the seigniorage from the issuance of the currency, which is equal to the difference between the face value of bills and coins put into circulation and the cost of producing them.[7] It would allow the retention of national symbols on the circulating notes, which is important to some nationalists in Canada. Finally, it has the advantage over the classical currency board arrangement; it is based on rules that specify outcomes rather than rules, which avoids problems stemming from changes in economic and financial conditions that were not foreseen in the development of the rules.

The fundamental issue facing all methods for hard currency fixes is the credibility of governments' commitment to their maintenance. This credibility is greater when there are more formal commitments to other nations. For this reason, the treaty establishing the euro is most likely to last. The other three arrangements are the product of unilateral decisions, which can be revoked without foreign diplomatic complications at the will of any government. The prospect that new, democratically elected governments will do so will always be there and considered by markets in their assessment of exchange rate risk.

However, this prospect will be influenced heavily by the size of the benefits net of the costs derived from the hard fixing. The remainder of this paper deals with these benefits and costs, and thus is essential in the full assessment of the usefulness of the different kinds of hard currency fixes just discussed.

3. TRADITIONAL BENEFITS AND COSTS FROM HARD CURRENCY FIXING

The traditional analysis of the merit of hard currency fixing found in the original optimum currency area literature finds benefits that take the form of lower transactions costs in foreign exchange markets and lower risk premiums on interest rates in capital markets. The costs consist of greater economic instability resulting from the inability to engage in monetary policies that stabilize aggregate demand, and thus unemployment.

3.1. Transactions Cost Savings

The main benefit from hard currency fixing arises from the savings in resources that are associated with the reduced need to operate spot, forward and futures currency markets, as well as the identification of and protection against exchange risk.

A special survey has been used in Europe to estimate the savings resulting from the shrinking of foreign exchange departments of banks, firms and governments and the number of currency dealers made possible by the introduction of the euro. The estimated savings were between 0.3% and 0.4% of national income of the average member country.[8]

It should be remembered that transactions costs remain for dealings in the currencies of countries outside the union. While these transactions require the maintenance of currency traders and markets, they represent a much smaller proportion of total trade and capital flows of each country since most of their trade and capital flows are with other members of the union.

Casual evidence suggests that the introduction of the euro has indeed reduced the size of foreign exchange transactions and the number of institutions and employees needed to execute them, though there have been no publications estimating the value of the actually realized savings. Travelers to and within Europe have happily enjoyed (difficult to measure) benefits of not having to make decisions about the exchange and holding of many currencies.

While all of these savings in transactions costs may be small in relation to national income, they can easily involve substantial absolute sums. For example, estimates of savings made by the Bank of Canada equal to 0.4% of Canada's national income are equal to C$5 billion or a little less than half of the country's annual spending on defense in recent years.

The economic impact of these savings in the longer run goes beyond the immediate savings of real resources since these savings are equivalent to the reduction of tariffs on trade, capital flows and travel, which are known to lead to substantial increases in international exchange and welfare.

3.2. Interest Rates

Before the creation of the euro, interest rates on bonds issued by central governments of European countries in their own currencies often were much higher than those issued by the government of Germany, which enjoyed the lowest rates of any government in Europe. The reason for this premium on some national interest rates was due to the financial markets' assessment of a country's risk relative to that of Germany in three dimensions: default, liquidity and exchange rate.

The importance of the exchange rate risk has become clear in the approximately five years leading up to the introduction of the euro in 1999. The gaps between the yields on the bonds issued by Germany and by the governments of Italy and Spain, for example, often were over 5 percentage points through the middle 1990s. Thereafter these gaps narrowed rapidly and reached near zero by 1999, where they have remained.[9]

About six years later, there remain small yield differences on bonds issued by different countries in Europe, much as there are such differences on bonds issued by different U.S. states. These differences in principle reflect the risk of default and the relative lack of liquidity, though in practice these differences are modified by the existence of default guarantees, actual and expected.[10]

Bris, Koskinen, and Nilsson (2002) found that the introduction of the euro also has lowered the cost of capital for firms inside the union relative to that of firms outside it. Hard fixes eliminate the need to deal with exchange risk on transactions with other firms within the currency area. This fact reflects the inability of forward and future markets under flexible rates to allow firms the full elimination of all exchange risk in their markets for outputs, inputs and capital.

The lower interest rates and costs of capital experienced in countries that are members of the euro zone will result in capital deepening and higher labor productivity.

3.3. Traditional Costs of Hard Currency Fixing

The main argument against hard currency fixes is that they completely deprive countries of their ability to use exchange rate adjustments and monetary policy to deal with economic shocks that destabilize the national economy.[11] Such shocks in the past were due to natural catastrophes like bad harvests or earthquakes, or due to political developments like terrorist attacks, or due to energy price increases, like those caused by the creation of OPEC in the 1970s.

The Bank of Canada, for example, insists that the country's heavy reliance on the export of natural resources makes its entire economy vulnerable to changes in their world prices and demand. During a world commodity boom, the industries producing commodities raise their prices, offer higher wages and prices for capital to attract resources needed to increase output for sale abroad, and thus impose inflationary pressures on the entire economy.[12]

During such inflationary commodity booms the Canadian dollar appreciates, which has the effect of reducing the domestic currency revenues received by producers, cuts their demand for labor and capital and thus lowers inflationary pressures. At the same time, the appreciation decreases the export and increases the import of other goods and services, which further reduces aggregate demand and thus domestic inflationary pressures.

The Bank of Canada uses interest rate increases to reinforce these exchange market developments. The higher interest rates attract foreign capital, which in turn raises the exchange rate even more. The higher interest rates also dampen domestic demand driven by higher incomes from the resource boom, which otherwise might cause inflation.

The analogous analysis applies when there is a slump in world commodity markets. Under these conditions, depreciation assisted by lower Bank of Canada, interest rates maintains aggregate demand and full employment.

However, the need for exchange rate changes in the face of a given external shock depends greatly on the extent to which this shock also affects the country's main trading partner. For example, if the U.S. and Canada relied to the same degree on natural resource revenues and they had otherwise closely integrated economies, the exchange rate between the two countries would not have to change or change only little in the face of changes in world prices for natural resources. Adopting a hard currency fix therefore would result in little cost in terms of greater macro-economic instability, since both countries require the same interest rate for stabilization of aggregate demand.

This fact has given rise to the notion that the need for flexible exchange rates depends on the extent to which the industrial structures of two possible partners in a monetary union is the same. The more dissimilar the structure, the higher the cost of common external shocks. The classical studies on optimum currency areas therefore focused on the similarity of industrial structures in countries contemplating monetary union.

However, the Keynesian paradigm also sees problems from the loss of national monetary sovereignty in the case where countries have the same basic industrial structure, but not the same mix of industries. For example, consider that both countries in a proposed union rely heavily on agriculture in their national output, but one grows oranges and the other grows wheat. Under these conditions, if the prices of oranges go up and those for wheat go down, one country needs a higher and the other lower interest rate to deal with the macro-economic disequilibria.

Since monetary union between these two countries allows the existence of only one interest rate, monetary policy cannot be used optimally in both countries to restore equilibrium, and macro-economic costs of unemployment and lost output are the result. In the light of this reasoning, some empirical studies of the merit of monetary unions examined the extent to which external shocks are asymmetric, i.e. they affect industries differently in each country. The greater the asymmetry in external shocks, the greater is the cost of hard currency fixing.[13]

It is not surprising that the classical studies found that the industrial structures of all countries differ to some degree and that exogenous shocks are not symmetrical. These studies concluded that for all countries considered, the cost of hard currency fixing was very high and obviously larger than the micro-economic benefits. On these grounds, many economists opposed the creation of the European Monetary Union and the creation of the euro. They predicted that the high costs of such a union would prevent it from ever coming into effect. When it became obvious that their predictions were wrong and the union was formed, they predicted its early demise. Indications are that the union has been successful and that it will last for some time to come, even though there is a strong tendency to blame – unjustifiably in my view – many of the economic and political problems in countries of the union on the existence of a common currency.

4. SIMPLE MODIFICATIONS OF THE KEYNESIAN MODEL

While many studies in the Keynesian tradition focused on the similarity of industrial structures and the incidence of symmetric and asymmetric shocks, some theorizing discovered that even within that analytical framework, there were several characteristics of countries that reduced the macro-economic costs of currency fixing.

First, the most fundamental modification of the analysis involves the notion that the macro-economic costs of economic shocks are a decreasing function of the economy's wage and price flexibility.

As is well known from classical economic theory, under perfect wage and price flexibility, unemployment and lost output do not exist. Keynesian economics challenged the universal validity of this conclusion and since wages and prices are not flexible, external shocks do result in some unemployment and loss of output. However, it is clear that any analysis of the costs and benefits of hard currency fixing needs to take account of the degree to which wages and prices are flexible in the countries involved.[14]

Second, the cost of dealing with shocks is a decreasing function of the perfection of capital markets. For example, if cold weather damages the citrus crop in Florida, private capital flows allow the regional economy to sustain itself during such a period of distress.[15] Thus, the more readily capital flows to distressed regions, the lower is the cost of capital and the smaller are the welfare losses from external shocks.

Third, the greater is the mobility of labor within the currency union, the lower are the costs of adjusting to external shock. For example, if the fear of terrorist attacks causes many American pensioners living in cold states to give up their usual winter-trips to the warm states, the resultant unemployment in the warm southern states will be less, the more readily workers serving these pensioners are willing to move to the cold northern states, where the pensioners will spend their income and cause increased demand for labor. The low propensity of European workers to migrate between countries has been used to argue that the cost of European monetary union is high and does not benefit its members.

Fourth, the costs of external shocks are also reduced by fiscal transfers from central governments to regions in economic distress. Europe does not have a government or agency providing such assistance and therefore may be expected to suffer more from unemployment and lost output than do regions of the United States that receive transfers when external shocks cause economic suffering.[16]

The fifth modification of the basic optimum currency area models involves the fact that a random distribution of natural, technical or demand-driven shocks within a currency area will average out more, the greater is the domain of a common currency. Thus, in the United States a bad citrus harvest in Florida is likely to be offset by a simultaneous bumper crop of apples in Washington State. As a result, the U.S. dollar price index for fresh food is more stable than would be such a food index for the two states if each had a separate currency.[17]

The more generally increased diversification of the economy in an enlarged currency union thus increases the overall stability of prices, wages, employment and output, whatever may be the general trend of the price level caused by the monetary authorities, including absolutely stable prices through time. One of the benefits from such increased price stability is the increased usefulness of money and the resultant increase in the efficiency of the financial sector.[18]

A sixth modification of the empirical results of the studies of economic shocks involves questions about the nature of such shocks. Most of the existing studies have assumed that all shocks are exogenous and unforeseen. In fact, however, studies of past economic shocks indicate that most have been caused by economic policies of the countries that experience them.[19]

Such endogenous shocks tend to emanate from faulty monetary policies and politically driven fiscal deficits that produced unsustainable inflation in goods and capital markets and irrational exuberance among the public. Many global shocks that are external to individual countries, like the energy price increases of the 1980s, are endogenous to the world in that the crisis was provoked by excess demand driven by faulty policies in the most important industrial countries simultaneously.

Another characteristic of genuinely external shocks in the world is that most of them develop slowly and do not have to cause major unemployment and other dislocations if they are properly anticipated, and government policies do not interfere with the private sector dealing with them.

For example, the global increase in demand for energy has resulted in the normal upward drift of prices that leads the private sector to reduce demand and to increase supply. If governments prevent such gradual adjustments, in time large price increases will be required to avoid rationing and other problems. Such large price increases should not be treated as an exogenous shock in optimum currency areas studies. These shocks are endogenous to the political system.

Seventh, the incidence of internally generated shocks is reduced if small countries with central banks subject to political influence give up their monetary sovereignty to a large central bank that is politically independent. For example, the European Central Bank is politically independent while some of the central banks of member countries were independent in law but in practice were not. In addition, the European Central Bank has larger resources available for the collection and analysis of economic data than did the central banks of member countries. These greater resources allow the use of increased competition among different economic theories and econometric models that decreases the risk of errors and succumbing to faddish theories.

While monetary policy mistakes will undoubtedly also be made by the European Central Bank and the mistakes will impact more people in a larger area than did the mistakes made by small central banks in the past, the effects on welfare for the community as a whole will be relatively smaller since economic relations among countries within the union are unaffected and most of their trade is with each other.[20]

The modifications of the basic optimum currency area models just discussed sometimes were mentioned in the many studies of the costs and benefits of monetary unions. However, the conclusions reached in these studies almost always were dominated by the concern over the effects of exogenous shocks on unemployment and lost output that was conditioned by the dominance of the Keynesian paradigm.

5. FUNDAMENTAL CHALLENGES TO OPTIMUM CURRENCY AREA MODELS

Two fundamental challenges to the optimum currency area models and studies developed in recent years. The first arose naturally from the demise of most of Keynesian economics. The second is based on the fact that the traditional model is static, assuming implicitly that economic conditions and institutions are not affected by the creation of a monetary union. In fact, most of the modifications of the traditional model presented in the preceding section are endogenous to the existing exchange rate regime.

5.1. The Demise of Keynesian Economics

In its simplest, vulgar version Keynesian economics is concerned with the manipulation of aggregate demand to create full employment through the use of monetary and fiscal policies. An important extension of the basic model involved the idea that unemployment could be reduced by inflation – the famous Phillips-curve trade-off.

This simple Keynesian paradigm received mortal blows from three different theoretical developments and empirical findings. The first of these is associated with the writings of Milton Friedman (1953) on the quantity theory of money and related topics. Friedman's theories were tested successfully in his own publications with Anna Schwartz (1963) and by a number of his students who worked under his supervision at the University of Chicago. These studies verified a strong relationship between the quantity of money and inflation, the absence of a long-run relationship between inflation and unemployment and the crucial role played by faulty monetary policy in creating and extending the Great Depression. These studies also showed that there are unpredictable lags of unpredictable length that follow changes in interest rates set by central banks.

Second, Robert Lucas (1972) argued that the success of Keynesian policies is based on the unrealistic assumption that workers suffer from money illusion, which means that they can be induced to accept work in the expectation of higher nominal wages without them, realizing that their real wages will be unchanged or lowered by inflation. Lucas argued that money illusion did not exist in a world of workers with rational expectations. His models explained the main empirical puzzle confronting Keynesian models in the 1970s, which was the co-existence of high unemployment and inflation, which was known as "stagflation".[21]

Third, Kydland and Prescott (1990) developed the theory that cycles in business activity and unemployment were caused by cycles in the development of new technologies that influenced the demand for labor and investment. The existence of and damage done by such cycles cannot be influenced by Keynesian monetary and fiscal policies designed to increase aggregate demand but always work themselves out as market incentives induce proper adjustments in the use and supply of labor.[22]

These challenges to the Keynesian paradigm are responsible for strong pessimism among many economists about the usefulness of monetary policy in dealing with endogenous and exogenous shocks. This pessimism implies that the costs from the loss of national monetary sovereignty either do not exist or they are much smaller than had been assumed in many studies of the benefits and costs of hard currency fixes.

In spite of the theoretical and empirical questions about the usefulness of monetary policy, central banks do exist and through time have improved their ability to maintain price and economic stability. However, this fact does not distract from the main conclusion for the analysis of the costs and benefits from monetary union. The less useful monetary policy is in dealing with economic shocks, the smaller are the losses arising from the surrender of monetary sovereignty through the adoption of hard currency fixes.

5.2. The Endogeneity of Institutional Characteristics

The traditional modifications to the assessment of the costs of losing national monetary sovereignty discussed in Section 4 refer to existing conditions and are treated as unalterable givens in the literature that first developed them. In fact, however, the most important of these modifications are conditioned by the exchange rate regime itself and are likely to change when a hard currency fix changes the environment in which the institutions function.[23]

Thus, unemployment rises when workers led by their unions refuse to accept lower wages, to retrain or to seek employment in other industries in response to exogenous changes in technology or consumer preferences that reduce the demand for their services. Similarly, unemployment increases when workers insist on higher wages that are not matched by productivity gains. Increases in unemployment due to such causes were frequent in many countries of Western Europe for several decades after the Second World War.

During this period governments responded to the higher unemployment by inflationary monetary and fiscal policies, which were considered to be appropriate according to the Keynesian economic models in vogue at the time. While the inflation reduced unemployment, it also caused balance of payments deficits and the subsequent devaluation of the national currency. The inflation also resulted in lower real wages, which led to a repetition of labor's demands for higher wages.

The cycles of unemployment, inflation, currency depreciation and renewed unemployment were repeated many times and led to cumulatively large effects. Between 1950 and 1990 the Italian lira lost 95% of its value, while that of the U.S. dollar and German mark fell 82% and 71%, respectively.[24]

It is important to note that during this period workers acted rationally. They enjoyed higher real wages, at least temporarily, than they would have otherwise and they knew that if unemployment developed, government would inflate the economy and depreciate the currency. Employers' willingness to give into workers' demands was based on the same expectations. Politicians in a democratic system could not afford to break the cycle, as other parties would promise to carry on with the cycle and win the next election.

However, the loss of national monetary sovereignty broke one of the key chains in the cycle of some of the countries in the European Monetary Union. Politicians no longer could promise to use the traditional inflationary monetary policy to relieve unemployment in their countries. As a result, the vicious cycle of unemployment, inflation and currency depreciation has ended. Workers and their unions have become less militant and are more willing to retrain and move from declining to rising industries.

In other words, labor market flexibility has increased as a result of the adoption of the hard currency fix. In this sense, the degree of labor market flexibility is endogenous to the exchange rate regime and the introduction of a hard currency fix reduces the cost that otherwise was argued to be associated with the loss of national monetary sovereignty.

The analysis just applied to labor market flexibility is also relevant to the efficiency of capital markets and the level of interest rates; reasons discussed in Section 1. The greater capital market efficiency and the lower interest rates result in more private capital flows between regions suffering from an economic shock and regions experiencing economic booms. Such flows compensate to a considerable degree for the lack of financial transfers through a strong federal government.

The adoption of a common currency also has some, if relatively minor, effect on labor mobility across borders, since the effects of migration are better known. This increased knowledge stems from the fact that the costs of consumer goods in terms of the common currency is more transparent, as are the wages, taxes and all the other factors determining real standards of living.

The strength with which the forces coming from hard currency fixing influence institutions depends on many factors. Advocates of the currency board in Argentina had hoped that it would lead to greater labor market flexibility and reforms of the country's arcane system of provincial financing. While the hard currency fix brought outstanding prosperity to the country for a number of years, the needed institutional reform did not take place and the hard fix was abandoned as public discontent over the adverse consequences were exploited through the political process.[25]

Ecuador is involved in another experiment worth watching.[26] The country's labor market rigidities, political system biased toward deficit spending, the excessive regulation of the private sector and other problems have caused the economy to remain stagnant for a long time. In an effort to deal with these problems, a courageous government introduced one of the most politically confrontational forms of hard currency fixing. It replaced the domestic currency with U.S. dollars.

It remains to be seen whether interest groups in Ecuador will be forced by the dollarization to surrender their privileges and make the economy more flexible. For some time, progress has been reasonable, but the discovery of petroleum resources and the aspirations of the native population in 2005 have led to political turmoil, which may well bring about an end to dollarization.

6. SUMMARY AND CONCLUSIONS

This paper presented the arguments for and against the hard fixing of currencies, starting with an account of the history and current conventional wisdom on the merit of fixed and flexible exchange rates. It pointed to an important dichotomy in the nature of fixed exchange rates: soft fixing accompanied by the retention of national monetary sovereignty and hard fixing that requires countries to give up the practice of making monetary policy.

At present, many economists and the IMF favor flexible exchange rates. However, at the same time a relatively small group of economists favors hard currency fixes for small countries.

The case for such hard fixes rests on the view that they bring substantial reductions in transactions costs and exchange rate premiums on interest rates. Other benefits consist of better monetary policy that is free from political influences and that can draw on larger resources to determine appropriate actions.

The case for hard fixes is strengthened by the critical evaluation of past studies of their costs. These studies were based on Keynesian models of the causes of unemployment and ability of monetary policy to reduce it successfully. These studies are flawed because they do not account for the limited usefulness of monetary policy in dealing with unemployment as was demonstrated by new economic theories developed and verified empirically during and after the 1970s. These studies of the costs and benefits of hard currency fixes are also flawed because they fail to understand the endogeneity of many of the institutional characteristics lowering the costs of losing national monetary sovereignty.

The analysis presented shows that the issues surrounding the merit of hard currency fixes are numerous and complex. Economists have neither the theoretical tools nor empirical data to engage in rigorous studies that consider even the most important of the determinants of the costs and benefits. However, Frankel and Rose (2002) have succeeded in making such a study using an indirect method.

These authors used a gravity model to measure the influence that distance, common borders of countries, past colonial relationships and other variables have on the level of trade between pairs of countries. They added to this widely used list of variables one for the existence of a hard currency. They found that this new variable is statistically significant. Countries with hard currency fixes have much higher levels of trade, given all of the country's other characteristics.

The authors also found that the higher is a country's level of foreign trade relative to national income, the higher is its per capita income. Combining the finding that currency fixing results in more trade and more trade results in higher income, they were able to estimate the impact of a hard currency fix on national income.

To illustrate the quantitative importance of this effect, they considered conditions for Canada and found that the adoption of a hard currency fix by that country would increase its trade by 184% and its GDP per capital by 37% over 20 years.

The authors were surprised by the size of this effect and attempted to manipulate assumptions that are always necessary in such studies so as to bias downward the results as much as possible. Their efforts resulted in only a small change in their best estimate. There is also the possibility that the result is unrealistic because the basic data in the gravity model involved many small countries while Canada in comparison is large.

Until economists can produce better empirical studies of the effects of hard currency fixes on income and welfare, the Frankel–Rose study must be taken as strong evidence that the micro-economic benefits are greater than the macro-economic costs, possibly by a large margin.

There remains one other issue not considered here. It involves the importance of political opposition to hard currency fixes, which is often based on nationalism and the coincidence with domestic policy objectives of politicians. Whether or not the expected income and welfare gains from hard currency fixing are large enough to overcome these forces requires another paper written by a political scientist rather than an economist.[27]

NOTES

1. For a more detailed discussion of these challenges to Keynesian models see Section 4.
2. See Mundell (1962).
3. I cannot find a citable reference for this proposition. However, in a private conversation when I asked him what he thought about Panama's use of the U.S. dollar in place of a national currency, he replied that, "I would never advocate that Panama have its own currency. The country simply is too small".
4. For an analysis of currency boards see Hanke (2002a). Hanke (2003) provides an insider's analysis of what went wrong with the currency board in Argentina.
5. A variant of this arrangement exists in Great Britain, where bank notes issued by some banks in Scotland circulate in Britain and are readily accepted at par with the notes issued by the Bank of England.
6. Such unilateral action is consistent with Canadian requests for a seat on the table of U.S. monetary policy makers to provide information about conditions in Canada and possibly a vote in decision on policy in the longer run.
7. In recent years the profits of the Bank of Canada have been about \$3 billion, which is paid to the federal government to be spent like tax revenue on public goods and services.
8. The original estimate is reported in "Delors Commission Report" (1989).
9. These developments are shown in graphs found in Grubel (2005b).
10. It has been argued that yield differences do not adequately reflect actual risks in Europe. While some have attributed this problem to the expectation that the European Union would not allow the national government of any member country to default on its debt, Buiter and Sibert (2005) showed that this problem is due to the

practice of the European Central Bank buying national government securities at par in the process of engaging in open market operations. This practice effectively prevents the development of appropriate default risk premia.

11. This general argument is found in a large number of studies of the European Monetary Agreement. A good representation of the argument is in Eichengreen (1992) and Bayoumi and Eichengreen (1993, 1996).

12. See Thiessen (1999) and Murray (2000).

13. See Eichengreen and Bayoumi (1997) for a full discussion of the concepts of symmetric and asymmetric and the role they play in the analysis of monetary unions.

14. Discussions of this issue are found in Johnson and Swodoba (1973).

15. This argument has first been advanced by Ingram (1973).

16. This argument was first made by Kenen (1969). See Eichengreen and Bayoumi (1997) for the argument in the context of the proposed European Monetary Union.

17. See Kenen (1969).

18. An elaboration of this argument and empirical evidence on its importance is found in Klein (1977).

19. See Belke and Gros (1999) and Pentecost and Sessions (2002).

20. More detailed analysis and empirical evidence is found in Grubel (2005a, 2005c).

21. Lucas' argument was central in the context of optimum currency area theory in a paper by McKinnon (1963).

22. Friedman's work became known as monetarism, Lucas' as rational expectations theory and Kydland–Prescott's as real business cycle theory. All four authors received Nobel prizes for their contributions. The preceding analysis is highly simplified and fails to mention the contributions of other economists and many qualifications to the basic findings. The literature surrounding these contributions is very large and cannot be cited here. Readers can find the relevant references on the personal web sites of the three Nobel laureates.

23. The best literature reference to this view is Frankel and Rose (1997).

24. For a complete list of countries and the rates at which their currencies have depreciated see Park (nd.).

25. For an account of Argentina's experience with currency boards see Hanke (2003), who was intimately involved in the creation of the board as an adviser.

26. For an early account of the Ecuador experiment see Emanuel (2002) and Hanke (2002b).

27. For an analysis of the forces involved in the political debate see Hefeker (1997) and Cohen (1998, 2002).

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PART B:
EMPIRICAL STUDIES ON REGIONAL INTEGRATION

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CHAPTER 5

THE GRAVITY OF GLOBALIZATION

Diego Agudelo and Lawrence S. Davidson

ABSTRACT

Can changes in the trade of the world's largest trading countries be considered more global? Or should they be labeled as more regional? We investigated these questions for the G7 countries for the time period from 1980 to 1997. We found that the usual dichotomy of global–regional is not rich enough to answer these questions because globalization can be measured in terms of both physical and cultural distance. Our new taxonomy allows for testing these separate impacts on world trade and suggests that trade changes are best described as regional, though with some qualification. With respect to physical distance, we find that trade is clearly becoming more regional. On the cultural dimension, however, we find conflicting results. These results are robust to a series of tests. We find the same pattern at industry level, except for paper products and motor vehicles. The regionalization pattern holds for both imports to and exports from the G7, but it is stronger for exports.

The central focus of the research is to measure changes in the degree of regionalization and globalization (heretofore, RZ and GZ, respectively) for the G7 countries (Canada, France, Germany, Italy, Japan, the UK, and the U.S.) between 1980 and 1997. Rugman (2001) and Rugman and Verbeke (2003, 2004) challenged the notion that the post-war period is best described

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by GZ and provides instead evidence in favor of RZ. This raises several issues, including how to best define RZ and GZ as well as how to measure their changes over time.[1] Davidson (2002, 2004a, 2004b) analyzed state-level U.S. export data to find evidence of both RZ and GZ. This paper suggests new definitions of these concepts and tests them with well-known gravity equations.

Our tests use Feenstra, Lipsey, and Bowen (1997) world trade flow data (bilateral import/export trade flow data for most countries, broken down by industry) and Andrew K. Rose's (2005) cultural, distance, and economic country data.[2] By estimating gravity equation parameters, we can measure the degree of change of RZ and GZ for the G7 countries. This approach uses the G7 group as a proxy for industrial countries and examines the trade of these seven countries with all their trading partners. This data set also allows us to probe further and examine these changes in GZ and RZ for the most important industries of the G7.

There is no single widely accepted definition of GZ in the international trade literature. To some people, GZ means a time period in which international trade increased at a faster pace.[3] At the other extreme is the idea that GZ is a new epoch – a time period that is qualitatively different from a previous period. While faster growth in international trade is one component of this larger view, it also contains the idea that trade goes above and beyond what went before. It suggests that trade overcomes physical barriers and stretches over longer distances. Implicit in this view is that trade also transcends cultural barriers and that traders go "farther" culturally by doing business in countries with new and different languages and religions. Under GZ, trade is enhanced not only by reductions in transportation and communications costs, but it is also expanded by trends that make it more desirable and possible to engage persons from different cultural backgrounds. The world is "smaller" in terms of moving across language and religions as well as the ease of moving across physical distance. Thus, our tests of GZ/RZ go beyond tests of physical distance to examine cultural distance. If international business is increasingly conducted with countries that are physically farther (closer) – this would be one form of evidence in favor of GZ (RZ). If international business is increasingly done with countries that have dissimilar (similar) languages and religions, this would be further evidence of GZ (RZ). Thus, in our tests an unambiguous finding of GZ requires a decline in the effects of both physical and cultural distance on trade – a finding that companies have "scaled" the world's kilometers, languages, and religions.

These distinctions have implications. One might say that international trade always involves greater distance and cultural diversity. But this would be stretching the point. If Spanish companies decide to trade more with new business partners in its former colonies in South America, the knowledge requirements and other business challenges are likely to be significantly different from those involved with new international deals in China or Moldova. If one thinks we are in a new age of GZ when in fact most of the new trade is regional (in terms of distance and/or culture), then business executives may be preparing themselves inappropriately.

We conclude that trade changes for the G7 countries between 1980 and 1997 are best described as RZ with respect to physical distance. That is, we find trade distances were declining, not increasing. We find mixed results with respect to cultural distance. Trade increased more with countries with different languages than with common-language partners (evidence of GZ). The result is just the opposite with respect to religion – trade was increasing more with countries of similar than dissimilar religions (evidence of RZ). These results remain statistically significant after performing a series of robustness tests. Most importantly, the economic effect of distance and language is substantial in all cases, while that of religion is economically small. These opposing cultural effects of religion and language suggest that Rauch's[4] network effects are at work, that is, more trade with close countries that speak different languages. This higher language barrier might be made more scalable if trade agents sought out partners of the same religion. As a result, we tried without positive results various immigration and foreign-born population numbers to investigate other determinants of common networks across countries. The language/religion results were unaffected by these additional tests.

The above results hold clearly for eight industries: raw materials, non-electrical machinery, textile products, food and related products, industrial chemicals, ferrous industries, household audio–video, and non-ferrous industries. Motor vehicles, on the other hand, exhibited neither GZ nor RZ in the physical and in the language sense. Paper products presented a clear pattern of GZ, but only in the imports to G7. The remaining 11 industries can be characterized as RZ in varying degrees and with increasing trade in different language countries.

1. GRAVITY EQUATIONS

We use gravity equations to estimate changes in GZ and RZ. Gravity equations have been used extensively in economic studies to estimate factors determining the size of flows (of capital, people, goods) between two geographic entities (cities, states, countries). More specifically, gravity equations have been employed recently to estimate the impact of currency unions and free-trade agreements on international trade.[5] We know of no study that has estimated changes in GZ and RZ in the post-war period.

In its simplest form the gravity equation proposes (borrows heavily from hard science applications of the pull of gravity) that the flow of activity (trade) is proportional to the product of the "size" of the two entities and inversely proportional to the distance. In the case of international trade, we have for countries i and j

$$\text{Trade}_{ij} = a(\text{GDP}_i \times \text{GDP}_j)\big/\text{distance}_{ij} \tag{1}$$

where GDP is a measure of economic size, distance is some measure of trade resistance, usually representing transportation and other costs related to the physical separation between the countries. A more general version of the gravity equation acknowledges the presence of information costs. Those costs are not only associated with physical distance, but also with the cultural differences between the trade partners.[6] Accordingly, a log version of the gravity Eq. (1) can be written as follows:

$$\begin{aligned}\log\ \text{Trade}_{ijt} = {} & a_0 + a_1 \log(\text{GDP}_{it} \times \text{GDP}_{jt}) + b_1 \textit{Log of distance}_{ij} \\ & + b_2 \textit{Cultural distance}_{ij} + \Sigma c_k Z^k_{ijt} + e_{ijt}\end{aligned} \tag{2}$$

where *Log of distance*$_{ij}$ is time invariant and is measured in miles or kilometers; *Cultural distance*$_{ij}$ measures the time-invariant cultural dissimilarity along the dimensions of language, religion, and migration between i and j;[7] $Z^k{}_{ijt}$ represents "k" control variables, Z^k usually incorporated in the bilateral trade gravity equation; and e_{ijt} is a random error term with the usual properties.

The distance model predicts that b_1 and b_2 should be negative. While physical and cultural distance may be fixed over time, their impacts may not. A decline in the costs of either form of distance is tantamount to a decline in distance barriers and numerically smaller b_1 and b_2. If, however, the opposite holds, distance becomes a larger drag on trade and evidence in favor of RZ.

Making use of our full data set, we begin with the basic model, where $t = 1$–18 for the years from 1980 to 1997 and augment this equation to test for changes over time by adding interactive terms:[8]

$$\begin{aligned}\log\ \text{Trade}_{ijt} = {} & a_0 + a_1 \log(\text{GDP}_{it} \times \text{GDP}_{jt}) + b_1 \textit{Log of distance}_{ij} \\ & + b_{1\text{a}} t \times \textit{Log of distance}_{ij} + b_2 \textit{Cultural distance}_{ij} \\ & + b_{2\text{a}} t \times \textit{Cultural distance}_{ij} + \Sigma c_k Z^k_{ijt} + e_{ijt}\end{aligned} \tag{3}$$

The null hypothesis is no change in the role of physical or cultural distance between 1980 and 1997:

$$H_0 : b_{1a} = b_{2a} = 0. \tag{4}$$

The alternative hypotheses are related to our definition of RZ and GZ as follows:

Distance	Culture	
	Similar	Dissimilar
Close	RZ $b_1 < 0$, $b_{1a} < 0$ $b_2 < 0$, $b_{2a} < 0$	Mixed $b_1 < 0$, $b_{1a} < 0$ $b_2 < 0$, $b_{2a} > 0$
Far	Mixed $b_1 < 0$, $b_{1a} > 0$ $b_2 < 0$, $b_{2a} < 0$	GZ $b_1 < 0$, $b_{1a} > 0$ $b_2 < 0$, $b_{2a} > 0$

In the empirical tests, cultural variables are defined in terms of cultural proximity (common language, common religion) rather than in terms of cultural distance. This only means that the expected signs of the cultural coefficients, b_2 and b_{2a}, are going to be the opposite to those indicated in the table above, without any loss of generality.

2. REGRESSION RESULTS

We begin by presenting results of the basic gravity equation applied to total trade in goods of the G7 countries and trade with 146 partners from 1980 to 1997. The list of countries included in this study is presented in the Table 1 of the Technical Appendix at the end of the volume. We then add time-interactive dummies to investigate changes in the impacts of key variables over time. Robustness tests are evaluated and we end the all-industries part with a discussion of the economic significance of our results. A final set of results analyzes industry effects.

2.1. All Industries, Full Time Period

The left-hand-side variable is the log of real bilateral trade in U.S.$ between each one of the G7 countries and 146 trade partners, from 1980 to 1997

Table 1. Gravity Equations of the Bilateral Trade of G7 Countries (1980–1997).

Variable	A	B	C
Landlocked	−0.73833***	−0.73829***	−0.73866***
	(0.08206)	0.08165	0.08159
Common language	0.38518***	0.37456***	0.46008***
	(0.09014)	(0.08987)	(0.10044)
Colonial relationship	1.31253***	1.3249***	1.41577***
	(0.11549)	(0.11565)	(0.13519)
Common currency	0.72189**	0.6974**	0.70421**
	(0.27436)	(0.27625)	(0.27664)
Log_areas	−0.04805***	−0.04804***	−0.0485***
	(0.01306)	(0.01306)	(0.01306)
Log of distance	−0.7759***	−0.76884***	−0.67637***
	(0.04897)	(0.04846)	(0.05069)
Log of real GDP	0.9054***	0.90617***	0.89159***
	(0.01642)	(0.01642)	(0.0186)
Common RTA	0.21573**	0.2008*	0.16013***
	(0.10359)	(0.10242)	(0.10417)
Religprox		0.00217*	0.00072
		(0.00121)	(0.00149)
Common language × *t*			−0.0099*
			(0.00559)
Colonial relationship × *t*			−0.01089
			(0.00754)
Log of distance × *t*			−0.01181***
			(0.00237)
Log of real GDP × *t*			0.00179*
			(0.00095)
Religprox × *t*			0.00017**
			(0.00008)
No. of observations	17712	17712	17712
R^2	0.82237	0.82269	0.82336

Note: This table presents the estimated coefficients of the log of bilateral trade by country-pair on several regressors. The sample consists of annual data spanning 1980–1997 for the G7 countries and their trade partners. All the regressions include a constant and year-dummy variables. *Log of distance* and *Log of real GDP* in the models B and C refer to the deviations of the mean of the log of distance and log of the product of the real GDP, respectively. Robust standard errors, calculated by clustering in country-pairs, are shown below the corresponding coefficient estimates.

*Statistical significance at the 10% level.

**Statistical significance at the 5% level.

***Statistical significance at the 1% level.

(from the database of bilateral trade in U.S.$ provided by Feenstra et al., 1997). Out of a total of 18,018 observations, 306 were dropped because they had zero bilateral trade, leaving a total of 17,712 observations. The right-hand-side variables – after Rose (2003) – (see Technical Appendix at the end of the volume for details) were[9]

Log of real GDP	Log of the product of the two real GDPs in 1995 U.S.$
Log of distance	Log of distance, in miles
Log_areas	Log of product of areas in squared miles
Dummy variables accounting for:	
Common language	If the countries share an official language
Colonial relationship	Ever in a colony relationship
Common currency	In a strict currency union/1:1 peg
Common RTA	In the same free-trade agreement
Landlocked	Number of landlocked countries in the pair (0,1,2)

We began with a pooled regression with yearly dummy variables, to account for fixed effects of time. Fixed effects are pervasively used in panel data models to account for omitted year effects, e.g. worldwide economic growth or decreasing cost of shipment. Therefore, in all the different specifications we include unreported yearly dummy effects. This first equation (column A of Table 1) does not include time-interactive variables, and include robust standard errors (clustering country-pairs) following Rose (2003).

All the estimated parameters are significant and with the right sign: the effects of *Log of real GDP, Colonial relationship, Common language, Common currency* and *Common RTA* are positive; the effects of *Landlocked*, *Log_areas*, and *Log of distance* are negative; the R^2 is quite high (82%), and all the yearly dummy variables are quite significant (not reported).

To test for changes in GZ/RZ over time, we turn to an evaluation of the changing effects of distance and culture on trade from 1980 to 1997. Recalling that cultural variables are measured in terms of proximity, the expected signs on the coefficients of physical distance are opposite to those of cultural distance.

The key variable for physical distance is *Log of distance* and for cultural proximity is *Common language* and *Colonial relationship*. Estimating cultural proximity is arguably more complex than a common language and/or colonial relationship. Thus, we add a religious proximity variable.[10]

Initially, we measured religious proximity by the percentage of people in each country affiliated with each of the major religious denominations – Catholic, Protestant, Orthodox, Jewish, Muslim, Buddhist, and Hindu.[11] Then, we calculated the first of our religious similarity variable (*Religprox*) as follows:

$$\begin{aligned} Religprox_{ij} = {} & \%\text{Cath}_i \times \%\text{Cath}_j + \%\text{Prot}_i \times \%\text{Prot}_j + \%\text{Ortod}_i \times \%\text{Ortod}_j \\ & + \%\text{Jew}_i \times \%\text{Jew}_j + \%\text{Muslim}_i \times \%\text{Muslim}_j + \%\text{Bud}_i \\ & \times \%\text{Bud}_j + \%\text{Hind}_i \times \%\text{Hind}_j \end{aligned} \tag{5}$$

Religprox is higher, the larger is the proportion of people from country i and country j that share the same religion. This variable can also be interpreted as the probability that a person, after a random draw from each country, may share the same religion.

After including this variable in the model, its regressor appeared with the expected positive sign, and was statistically significant, as shown in column B of Table 1. Consequently, we infer that the religious proximity variable accounted for cultural dimensions not directly measured either by *Common language* or by the *Colonial relationship* variables.[12]

2.2. Time-Interactive Effects

To investigate intertemporal changes of the effects of the cultural and distance variables, we added time-interactive variables in the model. The new empirical variables are then formed as the product between a trend variable t ($=$ 0 in 1980, $=$ 1 in 1981, and so) and variables *Log of distance*, *Log of real GDP*, *Colonial relationship*, *Common language*, and *Religprox*. For example, the interaction of *Log of distance* and time is denoted as *Log of distance* $\times$ t.

We included the interactive effect of *Log of real GDP*, since this is the single most dominant variable in the model, explaining by itself 71% of the variance of the log of real trade.[13] We did not add time-interactive dummy variables for *Common RTA*, *Landlocked*, *Common currency*, and *Log_areas*.

Column C of Table 1, henceforth referred to as the ‘‘Base model’’, shows reinforcing effects of distance and religious proximity over time, both strongly statistically significant. There are also marginally significant effects (at 10%) of the *Log of real GDP* (increasing) and the *Common language* (decreasing). There are no important multicollinearity problems, as indicated by a maximum and mean variance inflation ratio of 4.97 and 2.73, respectively.[14]

These findings are quite robust to different specifications. Following Rose (2003), we tried, alternatively, models with country-pair fixed and random effects to provide for potential omitted country-pair effects, a Prais–Winstein model with random effects to account for first-order autocorrelation of the residuals in the model, and a Tobit regression with random effects as used by Chen (2003), which admits observations with zero trade. The results are qualitatively the same, and are available from the authors upon request.

2.3. Robustness Test, Country Exclusions

Next, we tested the model's robustness to country changes by excluding one of the G7 countries at a time. Table 2 shows the results for excluding each country.

In general, these findings for specific countries are consistent or at least not contrary to those obtained with the pooled data model, and provide additional information. The increasing negative effect of distance on trade is especially robust, and of similar magnitude after dropping any of the G7 countries. The decreasing positive effect of common language seems concentrated mainly in the data of France, Italy, the UK, and the USA.[15] The decreasing effect of the variable *Colonial relationship* is not robust to excluding any country, with the exception of the USA. The increasing positive effect of common religion seems concentrated in Japan and in Italy.[16]

2.4. Further Robustness Tests

We submitted the model to a further series of robustness tests.[17] To verify that the results were not driven by a subset of very small or very poor countries, we considered excluding trade partners classified in the lowest three deciles of GDP in 1997 and, independently, excluding the countries in the three lowest deciles of trade for each of the G7's in 1997. The excluded-small country versions are labeled B and D, for GDP and trade, respectively, in Table 3.

We also ran an "error-in-variable" model to account for the estimated imprecision in measuring real GDP. Since *Log of real GDP* is the dominant variable of the model, any significant imprecision in its measurement casts doubts on the robustness of our results. To estimate that imprecision, we use

Table 2. Country Exclusions.

Variable	Exc_Canada	Exc_France	Exc_Germany	Exc_Italy	Exc_Japan	Exc_UK	Exc_USA
Landlocked	−0.775***	−0.747***	−0.780***	−0.713***	−0.717***	−0.773***	−0.691***
Common language	0.750***	0.405***	0.506***	0.479***	0.477***	0.472***	0.244**
Colonial relationship	1.129***	1.421***	1.419***	1.406***	1.417***	1.397***	1.615***
Common currency	0.520**	0.669**	0.675**	0.728**	0.722**	0.684**	0
Log_areas	−0.017	−0.052***	−0.053***	−0.056***	−0.057***	−0.048***	−0.046***
Log of distance	−0.654***	−0.687***	−0.703***	−0.634***	−0.656***	−0.698***	−0.702***
Log of real GDP	0.836***	0.898***	0.900***	0.905***	0.907***	0.906***	0.880***
Common RTA	0.230**	0.178	0.134	0.163	0.161	0.119	0.168*
Religprox	0	0.002	0.001	0.001	0.001	0	0
Common language $\times t$	−0.012***	−0.012***	−0.012***	−0.012***	−0.009***	−0.014***	−0.011***
Colonial relationship $\times t$	0.002**	0.002*	0.001	0.002*	0.003**	0.002	0.002
Log of distance $\times t$	−0.004	−0.014	−0.012	−0.01	−0.011	−0.005	−0.016*
Log of real GDP $\times t$	−0.017**	−0.007	−0.011*	−0.007	−0.012**	−0.01	−0.006
Religprox $\times t$	0.00020193**	0.00019201*	0.00019506**	0.00013442	0.00007013	0.00021851**	0.00016414*
No. of observations	15160	15122	15120	15120	15120	15120	15132
R^2	0.82126	0.82036	0.81039	0.81756	0.83124	0.8184	0.83288

Note: This table presents the estimated coefficients of the log of bilateral trade by country-pair on several regressors. The sample consists of annual data spanning 1980–1997 for each of the G7 countries and their trade partners, excluding one of the G7's in each model. All the regressions include a constant and year-dummy variables. Robust standard errors were calculated clustering by country-pairs for all the models (not reported).

*Statistical significance at the 10% level.

**Statistical significance at the 5% level.

***Statistical significance at the 1% level.

Table 3. Further Robustness Tests.

Variable	A Base Model	B Excluding Small_GDP	C Only Small_GDP	D Excluding Small_Trade	E Only Small_Trade	F Error-in-Variable Model
Landlocked	−0.739***	−0.520***	−0.958***	−0.569***	−0.552***	−0.478***
Common language	0.460***	0.498***	0.350*	0.501***	0.198	0.906***
Colonial relationship	1.416***	1.130***	1.810***	1.122***	1.701***	1.724***
Common currency	0.704**	0.718***	0.455	0.49	1.762***	0.647***
Log_areas	−0.049***	−0.052***	−0.022	−0.039***	−0.051**	−0.121***
Log of distance	−0.676***	−0.629***	−0.999***	−0.593***	−1.090***	−0.322***
Log of real GDP	0.892***	0.842***	1.061***	0.774***	0.989***	1.472***
Common RTA	0.16	0.152	0.548**	0.221**	0.954***	0.028
Religprox	0.001	−0.003**	0.011***	−0.001	0.006*	0.002***
Common language $\times$ *t*	−0.012***	−0.010***	−0.011	−0.008***	0.006	−0.039***
Colonial relationship $\times$ *t*	0.002*	0.006***	−0.016***	0.002**	−0.017***	−0.044***
Log of distance $\times$ *t*	−0.011	−0.002	−0.021*	−0.009	−0.023	−0.046***
Log of real GDP $\times$ *t*	−0.010*	−0.014**	−0.004	−0.016***	−0.008	−0.041***
Religprox $\times$ *t*	0.00017441**	0.00032537***	−0.00036873	0.00020428**	−0.00013848	0.00004645
No. of observations	17712	12343	5369	12459	5253	17712
R^2	0.82336	0.79505	0.57105	0.78375	0.51499	0.92509

Note: This table presents the estimated coefficients of the log of bilateral trade by country-pair on several regressors. The sample consists of annual data spanning 1980–1997 for each of the G7 countries and their trade partners. All the regressions include a constant and year-dummy variables. Robust standard errors were calculated clustering by country-pairs for all the models but D (not reported).

*Statistical significance at the 10% level.

**Statistical significance at the 5% level.

***Statistical significance at the 1% level.

the R^2 between the *Log of real GDP* used by Rose (2003) (calculated from GDP data from Penn World tables, WDI and IFS statistics) and the one used by us (mostly from WDI) obtaining a pooled correlation of about 91% for the common sample. Then, to account for a potential error in the estimation of this variable, we run the ''error-in variable model'' (model F in Table 3) with a reliability of the *Log of real GDP* value of 0.91.

The increasing negative effect of the log of distance is robust in all the specifications, but not in those that focus on the smaller countries by GDP or trade. So these effects appear not to be driven by a small-country effect. The increasing effect of the log of GDP over time does not fare well: it seems positive and strong when we focus only on the largest countries, but it changes signs when we account for the possible error in measuring the GDP. The decreasing effect of the common language over time is statistically significant in the relevant specifications. The increasing effect of the religious proximity variable is robust across the different specifications but in the last one, and it is clearly not driven by a small-country effect; on the contrary, it is stronger when we exclude the smaller countries either by GDP or by trade.

Finally, one might think that the mentioned time-varying effects of distance, common language, and similar religion might be reflecting the increase in trade of the G7's with the countries that abandoned communism in the early 1990s, after the fall of the Berlin Wall.[18] In particular, for the four European G7 countries, the boost of trade with Eastern Europe in the 1990s seems clearly a case of increasing trading at shorter distance and with non-common language nations. To control for that, we ran the basic gravity equation dropping the observations of the ex-communist countries,[19] as reported in column B of Table 4. In addition, we ran model C with a dummy variable (*ex_com*) for the ex-communist trade partners, and model D with a trend variable starting in 1991 for the ex-communist trade partners (*ex_comm_trend*). It is expected that the estimator of *ex_com* be negative, since it should capture the incremental difficulty in trading with those nations, while the estimator of *ex_comm_trend* be positive, reflecting the gradual rise of trade with them upon the fall of the Berlin Wall.

The resulting estimators of the variables *ex_com* and *ex_comm_trend* are highly significant and with the expected sign: the estimator of *ex_com* reflects the existence of barriers for the trade with the ex-communist countries, not accounted by the other variables of the gravity equation. The positive estimator of *ex_comm_trend* can be interpreted as a slow but continuous dismantling of those barriers. Adding these two variables significantly increases the R^2 of the model. A more complete study of the effect of the fall of Berlin Wall on trade is left for future study.[20]

Table 4. Controlling for the Effect of the Fall of the Berlin Wall.

Variable	A (Base Model)	B	C	D
Landlocked	−0.73866***	−0.73579***	−0.67418***	−0.67376***
Common language	0.46008***	0.35574***	0.39572***	0.36917***
Colonial relationship	1.41577***	1.40954***	1.40543***	1.39241***
Common currency	0.70421**	0.63132**	0.62726**	0.61369**
Log_areas	−0.04850***	−0.04343***	−0.04136***	−0.04201***
Log of distance	−0.67637***	−0.77451***	−0.76751***	−0.80580***
Log of real GDP	0.89159***	0.89489***	0.89855***	0.90191***
Common RTA	0.16013	0.01756	0.03868	−0.00169
Religprox	0.00072	−0.00068	−0.00024	−0.0007
Common language × *t*	−0.01181***	−0.00835***	−0.01295***	−0.00933***
Colonial relationship × *t*	0.00179*	0.00188*	0.00163*	0.00138
Log of distance × *t*	−0.01089	−0.0111	−0.01143	−0.01007
Log of real GDP × *t*	−0.00990*	−0.00574	−0.01002*	−0.00673
Religprox × *t*	0.00017**	0.00023***	0.00018**	0.00024***
ex_com			−0.96845***	−1.18890***
ex_com_trend				0.13902***
No. of observations	17712	16460	17712	17712
R^2	0.82336	0.83235	0.83164	0.8326

Note: This table presents the estimated coefficients of the log of bilateral trade by country-pair on several regressors. The sample consists of annual data spanning 1980–1997 for each of the G7 countries and their trade partners. All the regressions include year-dummy variables. Robust standard errors were calculated clustering by country-pairs for all the models (not reported).

*Statistical significance at the 10% level.

**Statistical significance at the 5% level.

***Statistical significance at the 1% level.

Regarding the increasing effect of religious proximity, the results of Table 4 are unambiguous: none of this seems attributable to an increase in trade with ex-communist countries. In the case of the increasingly negative effect of distance, models B and D suggest that only a small part of it might be attributed to an increased trade with the ex-communist countries. On the other hand, in models B and D the estimator of the interactive effect of common language and time, while still negative, loses statistical significance, although it is still economically significant as presented in the next section. This seems to imply that a good part of the decreasing effect of common language in the G7 trade might be attributed to an increased trade with the ex-communist countries with respect to the rest of the world.

2.5. Economic Significance

Taking the results of the Base Model (Table 1, column C), we can estimate the economic significance of the variables of interest. Overall, these estimations show that the increasing effect of distance, and the decreasing effect of common language over time are substantial, while the positive effect of religious proximity is modest.

First, the effect of *Common language* in 1980 was exp(0.46)−1 or 58%. That is, on average the group G7 traded 58% more with similar-language countries than with dissimilar-language countries, ceteris paribus. This effect decreased at a yearly rate of exp(−0.0099)−1 = −0.98%, so by 1997 the G7 group traded only 34% more with same language countries. On the other hand, taking the results of column B of Table 4, after excluding the ex-communist countries, the decreasing effect of common language is still important going from 43% in 1980 to 29% in 1997.

The quantitative effect of distance can be shown as follows: in 1980, a 100%, ceteris paribus, increase in distance meant an $\exp(-0.676 \times \log 2)-1 = -37\%$ of change in trade; while the same effect was $\exp((-0.676 + 17 \times -0.0118) \times \log 2)-1 = -45.5\%$ in 1997.[21]

Finally, going from 2% to 30% of religious similarity (interquartile range for the entire data set) increased trade by $(\exp(0.00072 \times 28))-1 = 2.5\%$ in 1980. The same effect was of $(\exp(0.00072 + 17 \times 0.0017) \times 28)-1 = 10.9\%$ in 1997.

2.6. Industry Effects

The database of Statistics Canada also provides the imports and exports between country-pairs discriminated for the 34 industries defined by the Bureau of Economic Analysis (BEA).[22] This allows us to explore to what extent the results from the gravity equation differ across industries. To do this, we begin with an industry-level gravity equation based on the one proposed by Chen (2003). This model is similar to the country-level gravity Eq. (2), but includes industry-specific variables, as follows:

$$\begin{aligned}\log(\text{Import}_{ijt,\ p}) = a_0 + a_1 \log(D_{it,\ p}) + a_2 \log(Y_{jt,\ p}) + b_1 \textit{Log of distance}_{ij} \\ + b_2 \textit{Cultural distance}_{ij} + \sum c_k Z_{ij}^k \\ + \sum c_{k'} Z_{ijt}^{k'} + \sum \text{dummy year}_t \qquad (6)\end{aligned}$$

where import $_{ijt,\ p}$ are the imports in real dollars to country "i" from country "j" of goods classified in the industry "p" in the year "t". At least one of the two "i" or "j" is a G7 country. We refer to this as "imports" only as a matter of convenience, since this variable represents both types of unilateral trade of the G7: imports and exports. The main explanatory variables are the log of $D_{it,\ p}$ the demand of products of industry "p" in country "i" in year "t", the log of $Y_{jt,\ p}$ the production of industry "p" in country "j" in year "t", the log of the distance, and the cultural distance variable (*Common language* or *Religprox*). Additionally, from the country-level model we include the time-invariant variables $Z_{ij}{}^{k}$ (*Log_areas*, *Landlocked*, and *Colonial relationship*), time-dependent control variables $Z_{ijt}{}^{k'}$ (*Common currency* and *Common RTA*), and year-dummy variables.

The industry gravity equation holds in any given time, so if we subtract the Eq. (6) for the period $t1$ from the one for the period $t2$, with $t2 > t1$, we obtain

$$\begin{aligned}\log(\text{Import}_{ijt2,\ p}/\text{Import}_{ijt1,\ p}) = {} & a_{1a}\log(D_{it2,\ p}/D_{it1,\ p}) \\ & + a_{2a}\log(Y_{jt2,\ p}/Y_{jt1,\ p}) \\ & + \sum c_{k'} \times (Z^{k'}_{ijt2} - Z^{k'}_{ijt1}) + a_{0a} \qquad (7)\end{aligned}$$

This way we are explaining the growth of the imports as a function of the growth of the industry-specific demand for the importer, the growth of the industry-specific production of the exporter, and changes in the time-dependent control variables. Note that the effects of the not-time-dependent variables are dropped, and that the effects of the year dummies are subsumed in the constant "a_{0a}" of the model. If we include the variables *Log of distance* and *Common language* in Eq. (7), they should come up insignificant if, and only if, the effects of these two variables in the industry trade are fixed over time. As a consequence, any explanatory power that a time-invariant variable such as *Log of distance*, and *Common language* may have in this model is just reflecting their time-varying effect. Then, model (7) is modified accordingly, to also include industry dummy variables to account for omitted industry-specific effects

$$\begin{aligned}\log(\text{Import}_{ijt2,\ p}/\text{Import}_{ijt1,\ p}) = {} & a_{1a}\log(D_{it2,\ p}/D_{it1,\ p}) + a_{2a}\log(Y_{jt2,\ p}/Y_{jt1,\ p}) \\ & + b_{1a}\mathit{Log\ of\ distance}_{ij} + b_{2a}\mathit{Common\ language}_{ij} \\ & + \sum c_{k'} \times (Z^{k'}_{ijt2} - Z^{k'}_{ijt1}) \\ & + \sum d_p \times (\text{industry dummy}_p) + a_{0a}. \qquad (8)\end{aligned}$$

The null hypothesis is that the distance and cultural proximity variables provide no explanation to trade growth in the different industries ($b_{1a} = 0$, $b_{2a} = 0$). If those estimators turn out significantly positive (negative), that would imply increasing (decreasing) trade growth at longer distances or with language similarity.

The estimation of Eq. (8) requires several steps. First, since data on industry-specific demand and production is not available for each of the 34 industries and the 147 countries included in this work, we estimate those variables as follows[23]:

$$D_{it,\ p} = \mathrm{GDP}_i \times \sum_j \mathrm{Import}_{ijt,\ p} \Big/ \sum_p \sum_j \mathrm{Import}_{ijt,\ p} \tag{9a}$$

$$Y_{jit,\ p} = \mathrm{GDP}_j \times \sum_i \mathrm{Import}_{ijt,\ p} \Big/ \sum_p \sum_j \mathrm{Import}_{ijt,\ p}. \tag{9b}$$

Second, instead of taking any arbitrary initial and final years, we measure the growth of unilateral trade using 5-year averages closest to the sample end-points: the average real trade from the period 1980 to 1984 and the average real trade from the period 1993 to 1997; we do the same for industry-specific demand and production in Eqs. (9a) and (9b). This way we are estimating the overall increase in trade over the entire period, using most of the data, while smoothing the effect of possible outliers.[24] Finally, to avoid obtaining results driven by a small-country or small-industry effect, for each industry we select the top observations representing 95% of the total bilateral trade. Out of a total of 47,067 industry country-pair observations, we end up with 14,903 covering 95% of the trade for each particular industry.

The results of model (8) are presented in column A of Table 5, where we pool together imports and exports of the G7 countries. The time-varying effects of the log of distance and the common language variable are both negative and highly significant. Moreover, the economic significance of those effects is quite similar to that reported for the all-industries models: doubling the trading distance meant an average reduction of 9% on the growth of imports from 1980 to 1997, while trading with a common language partner meant an average reduction of 15% on the same variable. Table 5 also presents the results for imports- and exports-only. The mixed-RZ pattern is present in both groups, but the magnitude of the RZ effect is twice as large for exports than for imports.

Next, we investigate the different effects of distance and common language across industries. Model (8) can be easily extended to investigate this by replacing the distance variable with interactive variables between log of distance and the industry dummies, and similarly for the common

Table 5. Industry Model.

Variable	A	B	C
Log_growth D_{ip}	1.031***	0.807***	1.050***
Log growth Y_{jp}	0.781***	0.741***	0.704***
Log of distance	−0.129***	−0.076***	−0.158***
Common language	−0.167***	−0.184***	−0.175***
Δ_*Common RTA*	0.633***	0.531***	0.716***
Δ_*Curcol*	−4.240***	−5.270***	−3.048***
Δ_*Common currency*	−0.331***	−0.32	−0.373***
No. of observations	14903	7752	7151
R^2	0.371	0.32176	0.42628

Note: This table presents the estimated coefficients of the log of unilateral trade by country-pair and industry on several regressors. The sample consists of the average industrial data for the periods 1980–1984 and 1993–1997 for each of the G7 countries and their trade partners. All the regressions include industry dummy variables not shown. Model A is for the pooled data set of imports and exports, model B for imports to the G7, and model C for exports to the G7. Robust standard errors not reported.

***Statistical significance at the 1% level.

language variable, as follows:

$$\begin{aligned}\log(\text{Import}_{ijt2,\ p}/\text{Import}_{ijt1,\ p}) = {} & a_{1\text{a}}\log(D_{it2,\ p}/D_{it1,\ p}) + a_{2\text{a}}\log(Y_{jt2,\ p}/Y_{jt1,\ p}) \\ & + b_{2\text{a}}\,\mathit{Common\ language}_{ij} + \sum c_{k'} \times (Z^{k'}_{ijt2} - Z^{k'}_{ijt1}) \\ & + \sum d_p \times (\text{industry dummy}_p) \\ & + \sum e_{1p} \times \mathit{Log\ of\ distance}_{ij} \times (\text{industry dummy}_p) + a_{0\text{a}}\end{aligned} \tag{10a}$$

$$\begin{aligned}\log(\text{Import}_{ijt2,\ p}/\text{Import}_{ijt1,\ p}) = {} & a_{1\text{a}}\log(D_{it2,\ p}/D_{it1,\ p}) + a_{2\text{a}}\log(Y_{jt2,\ p}/Y_{jt1,\ p}) \\ & + b_{1\text{a}}\,\mathit{Log\ of\ distance}_{ij} + \sum c_{k'} \times (Z^{k'}_{ijt2} - Z^{k'}_{ijt1}) \\ & + \sum d_p \times (\text{industry dummy}_p) \\ & + \sum e_{2p} \times \mathit{Common\ language}_{ij} \times (\text{industry dummy}_p) + a_{0\text{a}}.\end{aligned} \tag{10b}$$

We estimate Eq. (10) alternatively by pooling imports and exports of the G7 countries and separating imports from exports. The results of the interactive effect coefficients $e_{1\text{p}}$ and $e_{2\text{p}}$ are uninteresting by themselves; instead, we focus on their economic effects; see Table 6. For convenience, we only report the results of the top 20 largest industries for bilateral trade of

Table 6. Economic Effects of Distance and Common Language on Industry Growth of Trade 1980–1984 and 1993–1997.

Industry	BEA	% Share Total Trade 1980–1984	Distance Effect			Common Language Effect		
			Pooled Regression	Imports to G7	Exports to G7	Pooled Regression	Imports to G7	Exports to G7
Raw materials		25.1%	**−14%**	**−11%**	−8%	0%	33%	−27%
Motor vehicles	28	11.0%	−2%	4%	−4%	−2%	−15%	−2%
Other non-electric machinery	23	6.7%	**−11%**	−6%	**−8%**	**−22%**	**−29%**	**−17%**
Industrial chemicals	13	5.7%	−2%	5%	**−6%**	**−20%**	−19%	**−21%**
Textile product	5	4.6%	**−12%**	**−4%**	**−11%**	−1%	16%	−20%
Food and related product	4	4.0%	**−13%**	**−9%**	**−9%**	6%	12%	−3%
Other transportation	29	4.0%	−10%	−7%	−5%	**−29%**	**−41%**	−20%
Ferrous industries	17	3.6%	**−17%**	−7%	**−17%**	−18%	−25%	−13%
Household audio–video	25	3.5%	**−17%**	**−9%**	**−12%**	−11%	−18%	−10%
Non-ferrous industries	18	3.3%	**−22%**	**−20%**	**−10%**	−1%	2%	−9%
Instruments	33	3.2%	**−10%**	−3%	**−9%**	−8%	−13%	−9%

Computer equipment	22	2.6%	**−12%**	−4%	**−9%**	−11%	−14%	−7%
Other electric machinery	27	2.1%	**−17%**	**−9%**	**−14%**	**−21%**	−27%	−16%
Other manufacturing	34	2.0%	**−15%**	**−9%**	**−10%**	−11%	−9%	−19%
Construction	21	2.0%	**−12%**	−6%	**−10%**	**−38%**	**−57%**	−16%
Paper product	7	1.9%	11%	**22%**	**−7%**	6%	20%	−8%
Fabricated metal products	19	1.9%	−5%	2%	**−8%**	−21%	**−35%**	−8%
Wood, furniture	30	1.8%	**−15%**	**−4%**	**−17%**	**−30%**	−22%	−36%
Other chemicals	14	1.3%	**−8%**	**−5%**	**−5%**	**−26%**	**−34%**	−17%
Leather product	6	1.1%	**−11%**	**−12%**	−2%	**−25%**	−16%	**−37%**
Electronic components	26	1.1%	−9%	1%	**−13%**	22%	35%	8%

Note: Economic effect of distance and common language obtained from estimations of models (10a) and (10b). Economic distance effects refer to the effect of doubling trade distance on the growth of unilateral trade (imports, exports, or both), estimated as $\exp(e_{1p} \times \log 2) - 1$. Economics effects of common language refer to the incremental growth of unilateral trade from trading with common language partners, compared with trading with non-common language partners. Estimated as $\exp(e_{2p}) - 1$.
Economics effects derived from coefficients significantly different from zero at the 5% level are *indicated in bold.*

the G7 and raw materials covering the period 1980–1984 and 92.5% of total trade.

The results of Table 6 can be summarized as follows:

- The RZ result, understood as a more negative effect of distance on trade growth, was largely driven by the following trade flows: the imports of raw materials; the exports of non-electric machinery, industrial chemicals, and ferrous industries; and the bilateral trade of textile products, food and related products, household audio–video, and non-ferrous industries.
- On the other hand, the negative effect of common language on the growth of trade was due mainly to the following trade flows: the exports of raw materials and textile products, the imports of motor vehicles and both the imports and exports of non-electric machinery, industrial chemicals, and other transportation equipments.
- Most of the industries fall in the mixed-RZ trend found in the all-industry models. Only a few of the 21 industries showed trade patterns clearly opposed to the overall trend: first, the imports of paper products showed a clear pattern of GZ: doubling the trading distance represents a 22% increment of imports. Second, the imports of raw materials, textile products, food and related products, paper products, and electronic components showed sizable positive effects of common language, although none of them is statistically significant. Overall, the mixed-RZ trend of the bilateral trade is strongly present in the exports of the G7's, but it is also present in the imports to the G7's, albeit to a lesser degree.
- A few of the top industries showed neither a trend for GZ nor for RZ in both the physical and the cultural dimensions. That is clearly the case for motor vehicles, the second largest industry, which does not present significant changes of growth due to distances or language, neither for imports nor for exports. That is also partially true for the industries of instruments, computers, and electronics, though the exports of those industries show a trend for RZ.

3. CONCLUSIONS

Overall, the results indicate clearly that G7 countries tended to trade over time with closer countries, countries with dissimilar languages and with similar religions.

The increasingly negative effect of distance is robust under, and economically significant in, all the different specifications considered. Although the common language-decreasing effect is not statistically significant in some robustness tests, most importantly when the increasing trade with ex-communist countries is controlled, the estimators are always negative and economically significant. On the other hand, whereas the religion effect is robust to most specifications, it is economically quite small. All things considered, we believe that "regionalization with cultural qualifications" is the best way to describe the pattern of international trade for G7's in the sample period.

Focusing on the most important industries for trade in these countries suggests that most industries contributed to the general all-industries results. These results are present in both imports and exports to the G7, but are stronger for exports.

NOTES

1. If changes in world trade are truly best understood under the umbrella of RZ, as Rugman suggests, we seek to ask why by more closely examining trade by country and industry. We wish there were good data sets to facilitate this research that would allow investigation into the full post-war time period, but no such data exists. Since there were major changes in world financial arrangements in the 1970s, we believe starting in 1980 has merit on its own.

2. From http://faculty.haas.berkeley.edu/arose/RecRes.htm, November 2003. See Technical Appendix at the end of the volume for more information about data sources. We chose Feenstra's data over a similar database by Rose because Feenstra's had industry disaggregation of the trade flows. We perform a comparison of the Feenstra flows to those published by the Organization for Economic Cooperation Development (OECD). We found many differences between the two data sets, but the overall impression for tests like ours is that Feenstra's data is quite compatible with the OECDs (details available upon request). Because the databases do have differences, it is possible that one could obtain different test results using another database.

3. Rugman (2001) reviews several broader definitions of globalization and finally settles on the following: "the activities of multinational enterprises engaged in foreign direct investment and the development of business networks to create value across national boundaries". Rugman goes on (p. 12) to say that while globalization might exist in a few sectors (consumer electronics), "… it never really occurred; it is a myth. Instead the vast majority of MNE manufacturing and service activity is (and always has been) organized regionally, not globally".

4. Rauch (2001) and Rauch and Trindade (2002) found that business and social networks are used by companies in international trade to overcome informal trade barriers (weak contract enforcement and inadequate information). Rauch cites examples of Indian and Chinese networks operating at great distance.

5. Rose (2000) used a data set composed of 22,948 pairs, from 186 countries, for 1970–1990 in 5-year intervals. He ran both a pooled regression and separated regressions for each year, obtaining R^2 between 0.57 and 0.72, and all coefficients with the right sign and significant: specifically, with the exception of β_3 (distance) and δ (bilateral exchange rate volatility) all the coefficients are positive. His analysis is basically cross-sectional. Glick and Rose (2002) employed a very similar model, but in a panel data setting, providing for fixed and random effects alternatives, that control for the variation in the effect of common currency through time. Additionally, they included three new control variables: "$\text{Area}_i\text{Area}_j$" as the product of the two land masses, "Landl" the number of the landlocked countries in the pair (0, 1, or 2), and "Island" being the number of island nations in the pair. Egger (2002) pointed out several problems of the traditional Ordinary least squares (OLS) cross-section approach in the gravity equations, the most significant being, not properly accounting for the effect of time in the model, heteroskedasticity, and autocorrelation. He proposed a model that included four control variables, which reflect a country's freedom with respect to international exchange. He also included the real bilateral exchange rate in the model. He did not use as many control variables as Rose (2002) and his definitions of production, size, and per-capita effects also differed somewhat from Rose's. Egger tested his model with a data set of exports between OECD countries and 10 central and eastern European countries over the period 1986–1997. He obtained very high R^2 and ran several robustness tests. There are at least two papers that test the impact of language on trade (Hutchinson, 2002; Mélitz, 2002). Egger (2002) included variables for the contractual and legal environment that seemed relevant in his tests. Rose (2005) used a standard gravity equation with panel data covering 50 years and 175 countries to examine the effects of various international organizations (World Trade Organization, International Monetary Fund, and the OECD) on trade.

6. Doing business at increasingly physical, but not cultural distance implies the need for transportation communications and logistical information. If people are better informed about close-by events, increasing the physical distance of trade requires new sources of information about a wider variety of subjects. If instead, business is taking place at increased cultural distance, there will be additional requirements in terms of language, business practices, and other aspects of culture.

7. While physical distance between two countries is fixed between times (unless the legal borders change), the cultural proximity probably does change over time. We consider such changes to be small enough to ignore for our purposes. We admit, however, that an interesting extension of this work would treat trade and cultural proximity as mutually determined variables.

8. Our tests allow for several other interaction terms to allow for intertemporal parameter shifts of selected other right-hand-side variables.

9. Initially, the model included the variables *Island, Log of real per capita GDP, Curcol*, and *Common Border* (for definition see Technical Appendix at the end of the volume), included in the model of Rose (2005). However, the first three variables turned out statistically insignificant, which might be due to the fact that we have a different and smaller data set – focusing only on the bilateral trade of the G7 countries. Besides, the effect of border was found negative, whereas in Rose's model the estimator of a shared border is positive and significant. Again, it might be the

result of our focus on the G7 that produces the unexpected result. Having a common border does not add to the explanation of bilateral trade beyond what is already accounted by the variable *Log of distance*. Indeed, when we drop from the data set either the observations for Canada, or Germany and run the model without these countries (unreported), the perverse effect of border disappears as if it were concentrated in one or both of them.

10. Religion was also considered by Stulz and Williamson (2003), who perform cross-sectional comparisons of financial systems across the world.

11. Sources: CIA World Factbook 2004, Windows Encarta, and www.adherents.com, November 2003.

12. We also considered three additional cultural variables, that were discarded in favor of *Religprox*: (1) religprox2 was calculated after grouping Catholic, Protestant, Orthodox, and Jewish under the name of "Judeo-Christian" and using a similar expression as the one presented above; (2) commainrelig is defined as 1 if the two countries shared the same majority religion and 0 otherwise; (3) comcultreg, being 1 if the two countries share the same cultural region and 0 otherwise, as given by the geography textbooks. None of those variables fared better than *Religprox* in the model.

13. In so doing we found it necessary to replace the variables *Log of distance* and *Log of real GDP* with their deviations from the respective sample mean to avoid multicollinearity problems, and recalculate *Log of distance* $\times\, t$ and *Log of real GDP* $\times\, t$ accordingly. Doing so does not change the estimators of interest in this study.

14. We include also a t^2 term as explanatory variable and interactive variables between t^2 and the distance and cultural proximity variables, to account for possible non-linearities in the effect of time (not reported). The interactive effects with t^2 turned out to be not significant and the numerical estimators of the interactive effects with time were virtually unchanged. We thank Juergen von Hagen for this suggestion.

15. However, in all the cases the estimators of *Common language* $\times\, t$ are negative, and the decreasing effect of common language is economically significant in each of the models of Table 5.2 using the reasoning of Section 5 "Economic significance" (not reported).

16. Since the large increase of bilateral trade between USA and Canada, and USA and Mexico, was one of the most important facts in the last 20 years, we run models excluding alternatively the data for USA and Canada, USA and Mexico, and USA and both countries (unreported). The results remain qualitatively the same, and quantitatively almost unchanged. We thank Alan Rugman who suggested to check for this. Additionally, to see whether the results are mainly driven by interG7 trade, we also run the model excluding the bilateral trade between G7 countries (unreported). The interG7 trade accounts for roughly 30% of the total trade of the G7 countries. The results are qualitatively the same, and quantitatively almost unchanged.

17. In other non-reported robustness tests, the time-interactive effects were calculated over a 6-year horizon: we created, for each of the variables of interest (*Log of distance*, *Log of real GDP*, *Common language*, *Religprox*, and *Colonial relationship*), one interactive variable for the period 1980–1986 and another for the period

1991–1997. This way we were effectively investigating the different effects of each variable in each of the three 6-year periods. In a different robustness test, we used a stricter definition for the common language variable than the one used by Rose (2003). The results of those models are qualitatively the same of the Base Model, and are available from the authors upon request.

18. We thank Juergen von Hagen who suggested to check for this.

19. In our sample those countries are: Albania, Bulgaria, former Czechoslovakia, former USSR, former Yugoslavia, Hungary, Mongolia, Poland, Romania, and Vietnam.

20. Interestingly, the results of model D suggest that, after controlling for all the other factors, G7 countries traded 70% less with an ex-communist country than with a non-communist country before 1990, but that this difference dropped to 19% in 1997.

21. The 100% of increment on distance can be justified in this analysis since the ratio between the third and the first quintiles of distance of the entire data set is 2.18.

22. The BEA classifies industries in 34 groups. The remaining part of the trade that does not belong to any industry can be identified as ‘‘Raw materials’’ (e.g. vegetables, grains, livestock, oil, mineral products).

23. We thank the editor for this suggestion.

24. On top of that, not including the observations of the years 1985–1992 has the virtue of reducing, or perhaps eliminating, the effect on Eq. (8) of the autocorrelation of the residuals expected in model (7).

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CHAPTER 6

A SOUTH AMERICAN PERSPECTIVE: REGIONAL VERSUS GLOBAL TRADE PATTERNS

Diego Agudelo, Galia Julieta Benítez and Lawrence S. Davidson

ABSTRACT

This study presents evidence of increasing regionalization of international trade among 10 South American countries from 1980 to 2001. Regionalization of trade in South America is best described as an increasing trade among Spanish-speaking countries and increasing trade within the two regional agreements, the Andean Community and Mercosur. There is also evidence of border erosion in the continent, especially among the Mercosur members. These results emerge from a simple statistical analysis and are also economically significant when tested in a consistent gravity equation that controls for a set of macroeconomic and geographic variables.

The 1980s marked a radical shift in Latin American economic development strategy. Inward-oriented policies of import substitution were transformed into outward-oriented, market-based development strategies. Amid debt crises the countries of the region were forced to implement stabilization and structural adjustment programs, which brought restrictive macroeconomic

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polices, market deregulation, and the adoption of unilateral policies aimed toward opening up their economies to neighboring countries and the rest of the world (Chudnovsky, 1997). Regional integration is not a new phenomenon in South America. In the 1990s the integration process was reinvigorated, with countries adopting liberalization policies with respect to international trade. The new openness was seen as an essential mechanism for Latin American governments to gain markets and to advance their region on the global map.

During the past three decades, Latin American trade has progressed along two parallel paths. The promotion of closer trade relations among neighbors has stimulated a regional level of integration. At the same time, there has been a diversification and deepening of commercial relations with countries outside the region. In light of these dual directions, our research focuses specifically on the South American countries,[1] their regional trade agreements (RTA), and whether trade in the area has become more regional or more global over the sample period from 1980 to 2001.

The principal argument advanced here is that South American trade, between 1980 and 2001, has become more regionalized relative to extra-continental trade. Intra-continental activity was driven by trade within the two major RTAs in the southern American hemisphere, Mercosur, and the Andean Community, and to a lesser extent by trade between these two RTAs and Chile. Trade between the Mercosur and the Andean Community was an extremely small contributing factor.

South America has one of the lowest propensity to trade in the developing world. The impact of RTAs on this continent has been small relative to what has happened elsewhere. Nonetheless, over our sample period, South America has experienced similar trends of trade regionalization reported for the G7 countries; see Chapter 5 in this volume.

Using the results of the gravity equation, South American regionalization can be best characterized as taking place among Spanish-speaking countries; that is, trade has grown primarily among countries speaking Spanish in South and Central America and Mexico. The results also indicate that Chile has been most open to trade, whereas Colombia and Ecuador have been the least open. Regarding borders, and with reference to the gravity model, Argentina has traded below expectations with Chile, Brazil, and Uruguay; similarly, Colombia, Venezuela, and Ecuador have been relatively isolated from their neighbors. Overall, most of the South American borders have eroded over time, especially among Mercosur members.

The gravity equation has been applied extensively to explain the trade of South American countries, as well as the worldwide trade. Frankel, Stein, and Wei (1995) study the impact of RTAs around the world from 1965 to 1990 (every five years) including the Andean Community and Mercosur, but their analysis does not include the 1990s, when most RTAs took place. Carillo and Li (2002) study the industrial effects of RTAs in South America, but deal only with intra-continental trade, which in 2002 was less than 15% of the total trade of the continent. Croce, Juan-Ramón, and Zhu (2004) and Carrere and Schiff (2004) measure the role of distance on international trade and are the studies whose findings are most related to our research. The former finds evidence of an increasing trade between the members of the same RTA, and between bordering countries in the Western Hemisphere. The latter finds evidence of a decreasing average distance of trade for worldwide trade. Nonetheless, neither study uses the standard approach of the gravity equation and, hence, we have doubts about their results.

This chapter intends to overcome several of the shortcomings noted above. First, it covers a longer period of time, from 1980 to 2001. This is important because the regionalization processes in South America were either being launched or revamped in the 1990s. Second, we employ the consistent version of the gravity equation, as proposed by Feenstra (2002) and used by Rose (2004). In addition, we use the data of international trade at the country level provided by Statistics Canada, from 1980 to 2001, for each South American country with its trade partners (as listed in Table 1 of the Technical Appendix at the end of the volume).

We start by defining regionalization and globalization and a historical overview of the main issues that have affected the countries of South America throughout the last three decades. Next, we turn our attention to RTAs and, in particular, to two regional integrationist initiatives, the Mercosur and the Andean Community. We then present and discuss the empirical results. Finally, we draw conclusions and an agenda for further research.

1. DEFINING CONCEPTS: REGIONALIZATION AND GLOBALIZATION

The definitions of globalization and regionalization adopted in this study draw upon the international trade literature. Globalization will be defined as increased trade over longer distances, and regionalization as increased trade at shorter distance (as discussed in Chapter 5, this volume). Three further complementary definitions provide a more comprehensive view of regionalization. Regionalization can be understood as increasing trade with bordering countries, leading to borders becoming *thinner,* as suggested in Chapter 2 (of this volume). A third definition of regionalization considers the increasing trade between members of the same RTA as in Croce et al. (2004), Soloaga and Winters (2001), and further discussed in Chapter 2 (this volume). Finally, regionalization can be defined as increasing trade between countries that share a common language as long as those countries are relatively close to each other, as is the case for all South American countries except Brazil.[2]

These four distinct regionalization definitions can overlap and be in part contradictory; for example, regionalization might hold in terms of distance, borders and RTA, but not in the lingual sense. Thus, by including these four definitions in the empirical model we are measuring regionalization along different dimensions, and at the same time making them compete to find out which one(s) better describe(s) the dynamics of South American trade.

2. SIMILAR JOURNEYS, DIFFERENT PATHS

In the past 30 years the countries of South America have undergone intense political and economical transformations. In the political realm, several countries were in transition to democracy. In the economic sphere, by the mid-1980s these countries moved away from protectionist policies of import substitution to policies aimed toward opening up their economies, reducing trade barriers, eliminating non-tariff barriers, and implementing export promotion strategies (Weaver, 2000). These policies enabled the countries to engage in regional integrationist processes as well as to participate more intensively in multilateral initiatives (Rodríguez-Mendoza & Kotschwar, 1999).

Trade reforms in South America were implemented differently in different countries, although generally import substitution models gave way to trade liberalization policies. In Brazil, trade liberalization began during the 1980s and was intensified during the government of president Collor de Mello, who radically reduced or eliminated non-trade barriers and tariff barriers (Da Mota-Veiga, 1990). Brazil sees itself as a leader of Latin America and the developing world. This was evidenced in the period of *grandeza* – greatness – when the military regime of the 1960s and 1970s made clear that they would not follow the United States' lead (Selcher, 1981). This position shifted during the 1980s, when the country began aligning with the U.S. Brazil, the only Portuguese-speaking country in South America, was perceived with suspicion by neighboring states (Roett, 1999).

In contrast to Brazil, Argentina did not launch market and trade reforms until the start of the 1990s. Argentina has had a long history of political and economic turbulence. In 1991, it implemented a strong currency reform, the Convertibility Act, that came to a halt in 2001 with a massive debt default of over $130 billions. This crisis, which forced President La Rúa to step down, was the result of a combination of factors including a trade deficit produced by import liberalization policies, real appreciation of the domestic currency, and the financing of trade deficit with foreign savings (Tussie, Casaburi, & Quliconi, 2004, p. 79).

Chile is frequently cited for its remarkably diversified international trade relations and for being a successful export-led economy. Chilean liberal economic reforms began in 1973 by a military government and have continued to these days, with the exception of the 1982 debt crisis, when the country's flat trade tariff was raised from 10% to 35% until 1985 (Silva, 2004). Uruguay opened up its economy in 1973, also under a military rule. Because of its small population (the smallest in Latin America after Panama), Uruguay's openness was essential to gain access to its neighbors' markets. Colombia and Venezuela liberalized later, Venezuela's unilateral trade liberalization began in 1989–1991, Colombia's in 1990–1991. Peru's economic liberalization processes can be traced as far back as the 1948 Odría coup, which adopted an open, export-led economic growth model. However, subsequent governments halted these reforms; the country is one of the most radical in Latin America. In the 1990s, Peru embraced trade initiatives at different levels – unilateral, regional, and multilateral – and implemented gradual tariff reductions (Reynoso, 2004).

3. SOUTH AMERICAN RTAs

Since the time of Simón Bolivar[3] the idea of an integrated Latin America has ebbed and flowed; numerous visions and initiatives have been proposed and implemented across the course of time. The first attempt to build a unified Latin America goes back to Simón Bolivar's 1826 proposal for a confederation of the Republics of Latin America. The proposal failed; a new rhetoric followed, embodied in the pan-American movement of the mid-1880s. In contrast to Bolivar's plan, this movement aimed at closer cooperation within Latin America and across the American continent.

Renewed interest in Latin American integration emerged in the 1950s and 1980s. The Latin American Free Trade Association (ALALC) was created in the 1950s under the leadership of Raul Prebisch. It sought the formation of a free trade area as well as economic development through import substitution policies. In 1980, ALALC gave birth to a new association, the Latin American Integrationist Association (ALADI). These institutions would eventually be known as "old regionalism."

Many commentators and scholars have written on the failures of old RTAs. Among the most commonly cited reasons are the incomplete removal of barriers, the restrictive nature of liberalization plans, and the poor implementation and reneging of the agreements (Van Klaveren, 1993). In the 1960s and the 1970s, regionalization efforts were motivated by achieving independence from developed countries. *Dependistas* advanced the view that Latin American development had been shaped by the interests and interventions of the dominant developed countries, prompting some authors and commentators to the conclusion that dependency and development are incompatible (Wise, 1999). The *dependista* Fernando Cardoso asserted that it was possible to be dependent and to integrate.[4] But the facts showed that north–north (i.e., developed nations with developed nations) trade was growing faster than south–south (i.e., developing nations with developing nations) trade. Policy reformulations followed (Tussie, 1998, p. 85).

In the 1990s, regional integration received new attention and brought about the launch of Mercosur and the deepening of the Andean Community. This resurgence was called new regionalism (Carranza, 2000; Hettne, 1999) and, inspired by market-friendly principles, placed emphasis on export promotion, trade liberalization, and non-discrimination against the rest of the world (Bhalla & Bhalla, 1997, p. 21). These integrationist agreements and undertakings represent important qualitative departures, including the introduction of a bold emphasis on market forces, export promotion and trade liberation, global competition through scale, open trade, investment and growth. Along with other regional agreements around the world, Latin American efforts became broad-based strategies to confront perceived and real political and economic changes, tools for widening and expanding domestic markets while strengthening political and economic ties with the international system. While there has been a proliferation of RTAs in Latin America, almost schizophrenic (Pastor, 2001), the Andean Community and Mercosur are the most comprehensive.

4. THE ANDEAN COMMUNITY AND MERCOSUR

The Andean Community includes Colombia, Venezuela, Peru and Bolivia.[5] Created in 1969 by the Cartagena Agreement after the poor-performing

ALALC, the Andean Community covers a population of 118 million people (2005 data) living in an area of 4,700,000 square kilometers, with a Gross Domestic Product (GDP) of $650 billions.[6] In 1969, through the Agreement of Cartagena, Colombia, Ecuador, Peru, Bolivia, and Chile committed to the elimination of trade barriers and the creation of a common union by 1980. In 1973, Venezuela joined the group; in 1976, Chile withdrew from it. Even though a common external tariff was adopted by 1976 and all internal tariffs were eliminated by 1982, it was not until the 1990s that the group made its most important advances. By this time, these countries had adopted neo-liberal policies in place of the earlier import substitution policies. In 1991, Colombia, Venezuela, Ecuador, and Bolivia began reducing trade barriers, and by 1993 these four countries created a free trade area. By 1995, Colombia, Ecuador, and Venezuela established a common external tariff. These three countries faced domestic fragmentation resulting from domestic political instability (e.g., Peru), strategic reasons (i.e., Bolivia), or domestic conflicts (e.g., Colombia and Venezuela). Overall, the Andean Community has concentrated on establishing bilateral relations, and its policies have been unclear[7] and uncoordinated.[8] On paper, this group is committed to economic and political integration, but in reality these commitments have not been met.

Mercosur was created in March 1991 by the Asuncion Treaty and includes Brazil, Argentina, Paraguay, and Uruguay as full members, and Bolivia[9] and Chile[10] as associate members. This group is the most dynamic in Latin America and ranks third in size in the world, after the EU and NAFTA (Preusse, 2004; Schvarzer, 2001).

Mercosur forms one of the most important economic areas within the developing world: it accounts for 44% of the Latin American population and half of the output.[11] The relationship between Brazil and Argentina has determined the pace and path of Mercosur, as these two countries account for 96% of the members' GDP. On the subject, Bhalla and Bhalla (1997) state that

> … bilateral trade negotiations between Argentina and Brazil started when the two countries had political rivalries, suffered from macroeconomic instability and traded little with each other. The question then arises: what led them to believe that regionalism, which did not succeed in the sixties and in the seventies, would offer better results in the late eighties and nineties? (p. 142)

The literature points to the joint declaration of Foz de Iguazú on September 30, 1985 as the direct antecedent of Mercosur. A year later, several protocols, programs, and accords followed. At the end of 1986, the Act of

Democracy, Peace, and Development promoted political objectives such as integration, convergence, and mutual understanding. Then, Argentina and Brazil agreed on mechanisms for the integration of the automotive and food processing industries. In 1988, the treaty of Integration, Cooperation, and Development was signed: it proposed the elimination of tariffs and other barriers to trade (Magariños, 2001, p. 1). With the Asuncion treaty of March 26, 1991, Brazil and Argentina formalized their cooperation and set objectives of creating a common market by January 2005. During the transitional period from 1991 to 1994, several arrangements were reached regarding time tables for the reduction or elimination of tariffs and non-tariff barriers, and a consensus was reached to set up a free trade area by 2000 (Behar, 2000).

By contrast to the rest of South America, Chile is the only country that has signed unilateral agreements with different groups, without however committing to full memberships or being part of restrictive regional alliances (Marques-Moreira, 1999; Van Klaveren, 2000).

5. SOUTH AMERICA AND THE WORLD

Trade regionalization is not the only strategy pursued by South American countries. They have also followed trade opportunities with other countries of the hemisphere and the rest of the world. To begin with, it is important to highlight Mexico's relationships with South American countries. Mexico signed agreements with Bolivia in 1993; with Venezuela and Colombia in 1994 (the Group of Three); with Chile in 1999; with Uruguay the same year; and with Brazil in 2002. Chile signed an agreement in 1999 with the Central American Common Market, as well as with Mexico. Chile has signed trade agreements with countries outside of Latin America, including Canada in 1996, with the European Union (EU) in 2002, and the U.S. and Korea in 2003. Colombia signed agreements with Costa Rica, El Salvador, Nicaragua, and Guatemala in 1984, a year later with Honduras, with Panama in 1993, and with Caricom in 1994. Venezuela also signed an agreement with the Caricom in 1992; with Guatemala in 1985; a year later with Costa Rica, El Salvador, Honduras, and Nicaragua; with Trinidad Tobago in 1989; and with Guyana in 1990.

The countries of the Andean Community, as a group, have signed agreements with the EU, and negotiated the Political Dialogue and Co-operation Agreement in 2003. Mercosur also negotiated the Interregional Framework Cooperation Agreement with the EU, with the aim of creating a free trade area. Other agreements worth mentioning are the framework accord with India in 2003, and with Egypt in 2004.

The Free Trade Area of the Americas (FTAA) is a trade agreement, currently negotiated, extending from Alaska to *Tierra del Fuego*. This would encompass the 34 countries of South America, Central America, and the Caribbean (except Cuba), in addition to the U.S. and Canada. It would include a market of more than 800 million people and would make it the biggest trade area in the world. The FTAA is also a unique agreement because of the political and economic asymmetry of the membership. The FTAA would eliminate tariffs among participants within 10 years; it would also eliminate regulatory barriers. Negotiations are underway, but are shrouded by a veil of secrecy (Garay-Salamanca, 2002; Petrash, 2000; Gudynas, 2001).

In sum, South American countries have followed two approaches. The first is to have opened their economies and signed formal trade agreements with South American and Latin American countries. The second is to have built ties outside the region, in particular with the U.S., Canada, and the EU. In the following section, we show patterns and trends of international trade in South America.

6. TRADE PROCESSES IN SOUTH AMERICA

We begin, in Table 1, by describing the patterns of trade in South America from 1980 to 2001.[12] Rather than examine the data on a year-by-year basis, we average them for the first five years, 1980–1984, and the last five years, 1997–2001. This approach yields representative values at the start and at the end of the period that are less affected by year-specific fluctuations. Our analysis focuses principally on percentage changes across these two time periods. The presence of the two RTAs, the Andean Community and Mercosur, and Chile – which belongs to neither – imposes a natural partition of the continent into regions. We present summary data of the trade within each of the two RTAs; and the trade of the three partitions among themselves and with North America, the EU, and the rest of the world.

Panel A of Table 1 details the distribution of trade in South America by countries and regions. It shows that during the earlier period, 1980–1985, South American international trade is largely dominated by Brazil with a 39% share of the total, Venezuela with 25%, Argentina with 15%, and Colombia and Chile each with 8%. The total growth of trade of 42% from 1980 to 2001 is mostly due to Brazil whose trade grew by 58%. Also contributing to the strong growth were Argentina with 89%, Chile with

Table 1. Summary Statistics for South American Trade.

	Panel A: Total Trade (M 1995 US$)					Panel B: Trade with Common Lang. Partner			Panel C: Average Trade Dist			Panel D: Trade with Bordering Countries		
	1980–1985	%Share	1997–2001	%Share	Growth (%)	(%)	(%)	Δ Share (%)	1980–1987	1997–2003	Growth (%)	(%)	(%)	Δ Share (%)
Andean Community														
Venezuela	42,385	25	36,072	15	−15	11	19	7	3,512	3,059	−13	7	10	3
Colombia	13,781	8	23,184	9	68	18	26	8	3,984	3,470	−13	13	18	5
Peru	9,026	5	13,167	5	46	14	26	12	4,912	4,887	−1	11	16	5
Ecuador	7,186	4	8,571	4	19	14	31	18	4,294	3,905	−9	5	13	8
Bolivia	2,558	1	3,123	1	22	37	38	1	3,700	3,486	−6	45	41	−4
Intra Andean trade	1,790	1	4,943	2	176	100	100	0	679	766	13	88	78	−10
Andean with Mercosur	4,836	3	5,125	2	6	34	33	−1	1,577	1,628	3	76	72	−5
Andean with Chile	1,130	1	1,882	1	67	100	100	0	2,209	1,908	−14	21	41	20
Andean with North America	33,377	19	40,315	16	21	1	6	5	3,099	2,994	−3			
Andean with Western Europe	17,417	10	13,645	6	−22	10	13	3	5,375	5,562	3			
Andean with other	14,595	8	13,264	5	−9	14	18	4	5,400	6,286	16	1	1	0
Andean Total	73,145	43	79,175	32	8	12	19	7	3,927	3,735	−5	8	11	3
Mercosur														
Brazil	66,395	39	104,600	43	58	1	1	0	5,454	5,133	−6	10	18	8
Argentina	25,711	15	48,490	20	89	16	19	3	6,462	5,100	−21	17	37	19
Uruguay	3,779	2	5,891	2	56	21	32	11	5,081	4,299	−15	27	43	16
Paraguay	1,962	1	3,930	2	100	24	29	4	3,761	3,922	4	49	50	1

Intra Mercosur trade	4,421	3	17,211	7	289	17	12	−5	1,421	1,548	9	99	99	0
Mercosur with Andean	4,836	3	5,125	2	6	34	33	−1	1,577	1,628	3	76	72	−5
Mercosur with Chile	1,869	1	4,958	2	165	37	60	23	1,291	1,006	−22	32	56	24
Mercosur with North America	23,903	14	40,724	17	70	2	2	1	4,591	4,596	0			
Mercosur with Western Europe	27,016	16	43,152	18	60	4	6	2	6,033	5,944	−1			
Mercosur with other	31,381	18	34,532	14	10	2	1	−1	8,270	9,113	10			
Mercosur Total	93,425	54	145,701	60	56	6	7	2	5,871	5,479	−7	9	16	7
Chile														
Chile with Andean	1,130	1	1,882	1	67	100	100	0	2,209	1,908	−14	21	41	20
Chile with Mercosur	1,869	1	4,958	2	165	37	60	23	1,291	1,006	−22	32	56	24
Chile with North Am.	3,358	2	8,416	3	151	3	16	13	5,058	4,959	−2			
Chile with Western Europe	3,975	2	7,511	3	89	9	11	2	7,182	7,175	0			
Chile with other	3,016	2	8,719	4	189	1	3	1	9,437	10,525	12			
Chile Total	13,348	8	31,486	13	136	18	23	5	5,911	6,224	5	6	11	5
Trade within S.A.	14,046	8	34,119	14	143	46	51	5	1,426	1,388	−3			
Trade S.A. with the rest	158,037	92	210,277	86	33	54	49	−5	5,582	5,829	4			
Total South America	172,084	100	244,396	100	42	8	11	3	5,242	5,209	−1	6	12	5

136%, and Colombia with 68%. Notably, Venezuela was the only country in the region whose value of real bilateral trade fell (−15%). On the other hand, while trade with non-South American partners explained most of the total over the studied period, the intra-South American trade moved from being 8% to 14% of the total, which is evidence of increasing regionalization in the continent.

In Table 2, we see that Andean trade was concentrated with North America, Western Europe, and the rest of the world, while less than 12% was with South America. Similarly, Mercosur members did not trade much in South America in the early 1980s, but in the 1997–2001 period trade gained importance from 12% to 19% of the total trade of Mercosur.[13] Chilean distribution of trade by regions remained somewhat stable during our sample period.

Table 1 shows that the largest driving factors of the growth of total South American trade were the Chilean trade (growth of 136%), the intra-Mercosur trade (growth of 289%) and the trade of Mercosur with North America and Western Europe (growth of 70% and 60%, respectively). Other factors that contributed to the overall growth were the intra-Andean trade (growth of 176%), and trade of Mercosur with Chile (growth of 165%). In contrast, trade between the Andean Community and Mercosur grew by only 6%.

These initial results suggest that trade was increasing inside both Mercosur and the Andean Community. The increasing importance of intra-continental trade relative to the trade with the rest of the world supports the hypothesis of trade regionalization.

Panel C presents the average distance of trade for the countries and regions of South America; the results are ambiguous.[14] While the average trade distance is shrinking for each individual country during our sample period (with the exception of Chile and Paraguay), this parameter remains mostly constant for the continent as a whole.[15] Panel C also shows that increasing trade with same language partners happened for all South American countries, with the sole exception of Brazil, the only non-Spanish-speaking country in the area. Panel D shows that, with the sole exception of Bolivia, trade with bordering countries increased for all South American countries, especially for Argentina (the share went from 17% to 37%), Uruguay (27–43%), Ecuador (5–13%), and Brazil (10– 18%).

In summary, the results of Table 1 are indicative of an increasing regionalization of South American trade along four dimensions: rapid growth of trade between the members of the same RTA, rapid growth of intra-continental trade, an increasing trade across borders, and more trade

Table 2. Gravity Equation for the World Trade and Developing Countries, South American Effects.

Variable	1	2	3	4	5
Log of real GDP	0.547***	0.627***	1.020***	1.035***	0.615***
Log of distance	−1.436***	−1.494***	−1.105***	−1.176***	−1.477***
Log of real per capita GDP	0.482***	0.361***	−0.012	−0.016	0.349***
Common language	0.408***	0.385***	0.376***	0.326***	0.339***
Common border	0.351**	0.571***	0.797***	0.913***	0.635***
Landlocked	−2.455***	2.738	−0.473***	−0.459***	−0.654
Island	1.852***	−1.628***	0.028	−0.03	−2.949
Log_areas	0.520***	0.469***	−0.123***	−0.133***	0.417***
Common colonizer	0.654***	0.650***	0.781***	0.742***	0.576***
Curcol	−0.135	0.726	−0.111	2.051***	0.713
Colonial relationship	1.142***	1.208***	1.265***	1.450***	1.356***
Common currency	0.986**	0.861**	1.090**	1.026***	0.835**
Common RTA	0.221	1.706***	0.834***	2.180***	1.855***
SA			−0.398***	−0.389***	−7.803***
Log of real GDP × SA					0.191***
Log of distance × SA					−0.191**
Common language × SA					0.196
Common border × SA					−0.487*
Common colonizer × SA					0
Colonial relationship × SA					−1.238***
Common RTA × SA					−1.178***
Constant	−26.13***	−19.60***	−27.24***	−27.02***	−15.68
N	137,500	122,400	137,500	122,400	122,400
R^2	0.76	0.73	0.70	0.65	0.73
Data	World	Developing	World	Developing	Developing
Country fixed effects	Yes	Yes	No	No	Yes

Note: Regressand: Log of bilateral trade; Robust standard errors on clustering by country pairs; Country and year fixed effects not shown. *SA*: Dummy variable = 1, if either of the two countries is in South America (excluding the three Guyanas), = 0 otherwise.
*Significance level 10%.
**Significance level 5%.
***Significance level 1%.

between countries with the same language. While Chile's rising trade with the other South American members contributed to that overall trend, trade between the Andean Community and Mercosur did not; it grew by only 6% in real terms in the span of 22 years, against a growth of 42% for the overall trade and a 143% surge for intra-continental trade. Although intuitive, the analysis of this section is by no means rigorous. We did not control for factors known to explain increasing trade, for example the growth of the GDP. A more rigorous approach is presented below using the gravity equation.

7. GRAVITY EQUATION

We use the gravity Eq. (3) of Chapter 5 to explain the patterns of trade of South American countries – among them and with the rest of the world. Based on theoretical grounds, Anderson and van Wincoop (2003) argue for the adoption of a consistent gravity equation.[16] This approach is implemented by Feenstra (2002) and Rose (2004) using country-fixed effects in the gravity equation; thus, we include country-fixed effects whenever possible. The variables are defined in the Technical Appendix at the end of the volume.

As in Chapter 5, the panel data version of the gravity equation, complemented with time interactive variables, allows us to estimate the time-varying effect of the variables of interest. For example, if after adding to the model the interactive variable of distance and time, *Log of distance* $\times$ *t*, its coefficient result is positive and significant, we can infer that the negative effect of distance on trade is diminishing over time. This is the central part of our tests of regionalization and globalization – this parameter essentially creates a test that indicates whether trade is increasing closer to home (regionalization) or farther from home (globalization), while controlling for the other relevant factors.

Table 2, Columns 1 and 2, illustrates the results of the gravity equation for two datasets: for the entire world (145 countries) and for the subset of developing countries, replicating the results of Table 1 of Rose (2004).[17,18] Although we are using a different time frame and different source for the trade data, in the first two columns we obtain almost the same results of that paper: a positive and significant effect from the GDPs, the GDPs per capita, the common language, border, common colonizer, current colonizing relationship, and common currency. As in Rose (2004), we also find significant negative effects from distance, from the number of landlocked countries in the pair, and from the product of the areas. Consistent with Rose (2004), the RTA effect is much larger for developing countries than for the world as a whole, (an estimated 4.4 times larger).[19]

8. SOUTH AMERICAN EFFECTS ON TRADE

We investigate South America's propensity to trade by adding to the gravity equation the dummy variable SA, which is equal to one when either of the countries in the pair is from South America. Columns 3 and 4 of Table 2 show the results for the world and developing countries, respectively. The findings confirm the basic statistics shown earlier: South America trades less than the world as a whole or developing countries. The estimated coefficients of SA show that South America traded around 32% less than the rest of the world.[20]

We get some insight into South America's lower propensity to trade by including interactions between the main variables of the gravity equation and the South America dummy variable; see column 5 of Table 2. The interaction variables give an estimate of the additional effect of the key regressors for South America. For example, the negative significant sign of the log of distance means that distance is a larger negative factor for trade in South America than in the rest of the developing countries. To illustrate this, the impact on trade, of going from 1,000 to 3,000 mi implies, on average, an 80% reduction in trade for the developing countries but 84% for the South American countries.[21]

Furthermore, common borders are supposed to facilitate trade, and indeed the estimators of Table 2 suggest that bordering countries trade 88% more, on average, than non-bordering countries, after controlling for all other factors. For South America, the border effect is in the order of 16%.[22] These findings point to the historically weak trade relationship in South America. We explore this issue below and show that borders in South America have shrunk over time.

The incremental effect on trade, of belonging to the RTA is three times lower for South America than for the rest of the developing nations,[23] confirming the intuition that RTAs seem to have had less of an impact on bilateral trade in South America than elsewhere.

Finally, while the rest of the developing countries trade four times more with their former colonizers than with other countries, after controlling for confounding factors, this is not the case for South America. South American countries trade on average just 1.12 times more with Spain and Portugal than with other countries.[24] The colonial link with Spain and Portugal is understandably weak since South American countries have been independent since the early 1800s.

9. GLOBALIZATION VERSUS REGIONALIZATION WITHIN SOUTH AMERICA

Table 3 deals with the regionalization issue. We run the gravity equation only with South American observations. The basic South American model is

Table 3. Gravity Equation for South America, Time Varying Effects.

Variable	1	2	3
Log of real GDP	0.974***	0.987***	0.965***
Log of distance	−2.415***	−2.499***	−2.503***
Log of real per capita GDP	0.079	−0.047	−0.021
Common language	0.633***	−0.018	0.02
Common border	−0.273	−0.293	−0.177
Common RTA	0.529*	0.506*	−0.03
Log of real GDP $\times$ *t*		0.005***	0.005***
Log of distance $\times$ *t*		0.008	0.009
Common language $\times$ *t*		0.059***	0.057***
Common border $\times$ *t*		0.002	−0.01
Common RTA $\times$ *t*			0.047**
Constant	−14.797	−12.872	−12.158
N	20830	20830	20830
R^2	0.78	0.78	0.78

Note: Regressand: Log of bilateral trade for South American countries; Robust standard errors on clustering by country pairs; Country and year fixed effects not shown. *t*: trend variable (= 0 in 1980, = 1 in 1981, and so).
*Significance level 10%.
**Significance level 5%.
***Significance level 1%.

presented in Column 1,[25] while models 2 and 3 incorporate time interactive variables. For example, while in Column 1 the variable *Common language* reflects an overall positive relationship between common language and trade, the estimator of *Common language* $\times$ *t* in Column 2 shows that this has been increasing over time, and indeed the estimator of *Common language* in Column 2 shows that this effect was not significant at the beginning of the period. Similarly, Column 3 shows an increasing RTA effect. On the other hand, the parameters of *Log of distance* $\times$ *t* and *Common border* $\times$ *t*, show that the effect of distance and common border have not experienced significant changes. These results are robust under alternative specifications, which are not reported,[26] and confirm that South America trades increasingly with countries of the same language and RTAs. There is no significant evidence of trade changing at different distances or of changes in border effects.

In the next three sections we pursue in more depth three issues: the propensity to trade of individual South American countries, the intensity of trade of South America with different regions of the world, and border effects.

10. PROPENSITY TO TRADE

We employ dummy variables for individual countries in the gravity equation to estimate degrees of "openness" of each South American country, as shown in Table 4.[27]

Taking Ecuador as an arbitrary base (= 1.0), the estimated parameters of the gravity equation indicate that, for example, Chile trades almost five times more than Ecuador, and 1.6 times more than Brazil, after controlling the GDP, GDP per capita, common language, distance, and border effects; it is the most trade-oriented country in the region. Brazil, Uruguay, and Argentina appear also as countries relatively trade oriented. In contrast to the results of Table 1, the Andean countries, especially Colombia and Ecuador, appear less inclined to trade than the Mercosur countries. Chile's strategy, as we have explained above, has historically followed a differentiated trade policy in comparison with the rest of South America.

Table 4 also reports estimates of the annual change of the propensity to trade, estimated using the gravity equation. The results suggest that all the South American countries increased their propensity to trade during the period of study. The strongest rates of growth were experienced by Peru, Argentina, Colombia, and Ecuador; and the lowest by Venezuela.

Table 4. Propensity to Trade for South American Countries 1980–2001.

Rank	Country	Propensity to Trade 1980–2001	
		Average	Annual Change (%)
1	Chile	4.94	4
2	Brazil	3.00	3
3	Uruguay	2.86	3
4	Argentina	2.52	7
5	Peru	1.65	8
6	Venezuela	1.56	2
7	Paraguay	1.38	3
8	Bolivia	1.37	3
9	Colombia	1.11	6
10	Ecuador	1.00	5

Note: Average estimators obtained in a Gravity equation with country-fixed effects, and assigning a value of 1.0 to Ecuador; Annual change estimators obtained in a Gravity equation with time-interactive effects of South American country fixed effects.

11. INTENSITY OF TRADE

Panel A of Table 5 presents the estimated average intensity of trade between the three regions of South America and the rest of the world. To estimate these variables we used fixed effects in the gravity equation for trade between South American regions and the other regions in the world, defining intra-trade of the Andean Community as an arbitrary base, with a value of 1.0. Thus, for example, trade between Chile and Western Europe is 8.4 times larger than intra-Andean Community trade, after controlling for GDP, distance, common language, and other effects in the gravity equation. The results reflect that trade between Chile and the Pacific Basin (East Asia, Southeast Asia, Australia, and New Zealand) has been particularly intense, even after controlling for variables in the gravity equation. Moreover, the Pacific basin has also been an important partner for international trade of the Andean Community and Mercosur. The Chile–Andean Community trade has also been very important beyond what the proximity to Peru and Bolivia might imply, while the Chile–Mercosur trade has been relatively low. On the other hand, trade between the two regional groups and the U.S., Canada, and Western Europe have been at relatively normal levels according to the gravity equation (average values). All in all, the punch line of Panel A is that Chile has been a particularly active trading country with the

Table 5. Intensity of Trade with Different Regions in the World.

South American Region	Andean Community	Mercosur	Chile	U.S. and Canada	Mexico, Central America and Caribean Basin	Western Europe	Pacific Basin	Rest of the World
Panel A: Average intensity 1980–2001								
Andean Community	1.0	1.3	9.6	2.2	1.8	2.6	4.7	1.3
Mercosur		2.3	1.9	1.6	1.9	2.5	4.5	3.4
Chile				5.6	3.7	8.4	22.3	4.1
Panel B: Average annual change on the intensity 1980–2001								
Andean Community	9.7%	4.4%	−1.2%	−0.8%	2.8%	−2.0%	0.9%	0.4%
Mercosur		5.1%	0.3%	1.7%	0.8%	−0.4%	2.1%	−2.0%
Chile				−1.2%	4.5%	−0.4%	1.6%	−3.4%

Note: Average estimators obtained in a Gravity equation with country-fixed effects for the trade between the South American sub-regions and each of the world regions, assigning a value of 1.0 to the intra-Andean Community trade; Annual change estimators obtained in a Gravity equation with time interactive effects of sub-region-region trade.

entire world except Mercosur, and that the Andean countries have been trading relatively little between them.

In the sample period, intra-Andean trade surged by a 10% annual increment, trade among Mercosur members by 5.1%, and between Mercosur and the Andean community by 4.4%; see Panel B of Table 5. Trade with Mexico, Central America and the Caribbean countries gained intensity for the entire Continent, but especially for Chile and the Andean Community. Trade with the Pacific basin also increased significantly for all South America, while trade of Western Europe with the Andeans lost some intensity. The results of the gravity equation suggest that trade intensity of South America with the U.S., Canada, and Western Europe has not changed much in the 22 years of the study.

12. BORDER EFFECTS

Focusing on the intra-continental trade offers some interesting questions to be explored. For example, the findings of Table 5 suggest that Chile and Argentina, which share the longest frontier in the continent, have been trading relatively little. Furthermore, Table 5 shows that, on average, the Andean countries, most of which share a common border, have traded far less than their proximity, common language and size would predict in a gravity equation applied to South American trade. In addition, the results of Tables 2 and 5 point to a null or very small "border" effect on South America: bordering countries do not trade as much as expected. To investigate further this phenomenon, we estimate border effects between South American nations (see Table 6).[28]

The first column of Table 6 presents the estimated border effects. To allow a relative comparison, we assigned an arbitrary value of 1.0 to the border effect between Argentina and Brazil. Thus, for example, we find that trade between Colombia and Peru was 50% more than that for Argentina and Brazil, but around half that between Bolivia and Peru, after controlling for GDP, distance, common language, and other variables in the gravity equation. To be sure, these border effect estimators not only reflect the average infrastructure, topography, or logistic conditions in the frontiers. They also capture historical, political, industrial, and any other omitted country-pair factor not explicitly controlled by the gravity equation.

The stronger border effects, i.e., more porous borders, are present in the pairs formed by Bolivia with Argentina, Bolivia with Peru, Brazil with Paraguay, Brazil with Uruguay, and Bolivia with Chile. In alternative

Table 6. Effects of Borders on South American Trade.

Bordering Countries	Border Effect	
	Average Effect 1980–2001	Growth of Border Effect (%)
Argentina–Bolivia	4.06	−5.8
Argentina–Brazil	1.00	9.2
Argentina–Chile	0.03	4.5
Argentina–Paraguay	0.93	4.7
Argentina–Uruguay	0.06	5.1
Bolivia–Brazil	0.87	1.7
Bolivia–Chile	1.55	1.9
Bolivia–Peru	3.45	5.1
Bolivia–Paraguay	0.20	18.9
Brazil–Colombia	0.51	1.7
Brazil–Paraguay	1.92	1.9
Brazil–Peru	0.46	1.0
Brazil–Uruguay	1.82	2.6
Brazil–Venezuela	1.00	−2.0
Chile–Peru	0.91	2.7
Colombia–Ecuador	0.79	4.9
Colombia–Peru	1.49	4.2
Colombia–Venezuela	0.62	3.4
Ecuador–Peru	0.37	6.4

Note: Average estimators obtained using individual border fixed effects in a Gravity equation with Country-fixed effects for South American trade; Annual change estimators obtained in a Gravity equation with time-interactive effects of the border effects.

specifications, not reported here, these results are mostly unaffected by including RTA variables, suggesting that none of those border effects are driven by RTAs. Moreover, the results are indicative that an intense trade between Brazil with Paraguay and Uruguay was already in place before Mercosur commenced officially in 1992.

On the other hand, there are borders associated with average negative effects on trade: the two most critical cases are Argentina with Chile, and Argentina with Uruguay. The estimators imply that after controlling for GDP, distance, and the other variables of the gravity equation, Argentina traded with those two countries, on average, less than 6% of the trade with Paraguay or Brazil.

The borders of Bolivia with Paraguay, Ecuador with Peru, Brazil with Colombia, and Brazil and Peru have also been associated with less porous borders. The fact that the border of Brazil with Colombia and that of Brazil with Peru, is located in the Amazon jungle could explain the relatively low trade between them. However, the border between Colombia with Peru, and the border of Brazil with Venezuela are also located in the Amazon Jungle, yet those countries do not exhibit a negative border effect. It is evident that the border effects are gathering more than simple frontier conditions.

The gravity equation also allows to estimate the trend on those border effects over time, as shown in the second column of Table 6. The results indicate that for the most part, trade between South American bordering partners increased more than predicted by changes in the GDP, or any other variable included in the gravity equation. The two exceptions are Argentina–Bolivia and Brazil–Venezuela. Trade intensity across all other borders has increased over time, especially for those of Mercosur and Andean community members. The second largest change in the border effect is between Argentina and Brazil (9.2%), which attests for the increasing importance of their commercial relations since the 1980s, and confirms the findings of Table 1.

On the other hand, the border with the highest trade growth is not among countries participating in a common RTA, but between Bolivia and Paraguay (probably due to the fact that these two countries did not trade much in the early 1980s).[29] Bolivia presents an interesting case: for the period under study, on average, it has been trading actively with Argentina, Peru, and Chile, while not trading so much with Paraguay and Brazil. Now, Bolivia seems to have, to a large extent, replaced the Argentinean trade – with more trade with Brazil, Peru and, Chile and the Andean community members, while having a somewhat normal trade with Paraguay.

Taken together, the results of Table 6 suggest that Argentina, Colombia, Ecuador, and Venezuela have traded relatively little with their border neighbors. Especially dramatic have been the cases of Ecuador with Peru, Argentina with Chile, and Argentina with Uruguay, although these negative border effects have been diminishing over time. These findings are very well illustrated by the words of Marques-Moreira (1999).

> It is interesting to observe that physical barriers, the lack of transportation infrastructure capable of supporting a de facto integration, and institutional contrasts, have not only constituted an obstacle to integration between countries, but also among subregions within countries themselves.

13. CONCLUSIONS

This study presents evidence of increasing trade regionalization of 10 South American countries from 1980 to 2001. We find that South America has been impacted much less by globalization than countries in other parts of the world. South American countries trade less than other countries, distance seems to be a larger impediment to trade, and RTAs seem to enhance trade less there than in other parts of the world. Regionalization can be derived from several different sources – borders, distance, free trade agreements, and common culture and language. Trade regionalization in South America can be characterized as increasing trade with Spanish-speaking countries and increasing trade within the two RTAs. These results are evident in a simple statistical analysis and are also robust and economically significant when tested in a consistent gravity equation that controls for a set of macroeconomic and geographic variables.

Finally, to further deepen our knowledge of the patterns of trade in South America we should find out how the reported patterns of trade in South America are explained at the industry level. For example, we should identify what industries and products are most relevant in the growing trade of Argentina with Brazil, Chile with Mercosur, and the Andean Community, and the increasing intra-Andean trade. Is regionalization present in all industries or is it different for different industries? How would our results change if we were to consider imports and exports separately? Is South America still mainly exporting commodities while importing manufactured products and capital goods?[30] All those questions are left for future research.

NOTES

1. Although the three Guyanas (English, Dutch and French) are geographically in South America, they have been culturally and economically integrated to the Antilles and Europe rather than to the rest of South America.

2. The effects of the cultural proximity provided by language commonality have been recently included in the gravity equations (see for example, Rose & van Wincoop, 2001; Soloaga & Winters, 2001) while its time-changing effects are explored for the G7 countries in Chapter 5, this volume.

3. Simón Bolívar (1783–1830) won independence over the Spanish crown for Bolivia, Colombia, Ecuador, Panama, Peru and Venezuela. He is seen as the "George Washington of South America."

4. It is essential to qualify Fernando Cardoso because his thought has shifted dramatically during his career.

5. The original name of the Andean Community was the Andean Pact. In 1997, they changed the name to Andean Community of Nations.

6. Taken from CIA World Factbook site http://www.cia.gov/cia/publications/factbook, on June 17, 2005.

7. In the act of Barahona of December 1991, the presidents of the Andean Community agreed on an external tariff; however, how bilateral tariff agreements were to be compatible with a common external tariff has not been resolved.

8. In 1992, Colombia and Venezuela agreed to apply jointly a common tariff, though Peru and Bolivia continue to apply their respective regulations, while Bolivia has separate regulations.

9. After two years of complex negotiations and opposition from the private sector, in December 1996, Bolivia reached an agreement with Mercosur. This agreement was viewed by the Andean Community as a stab in the back for weakening the power to negotiate against other interest groups. In order to resolve this issue and not break the already fragile integration among the member countries of the Andean Community, this group issued special permission for Bolivia to begin negotiations with Mercosur.

10. The first agreement made by Mercosur was with Chile. After Chile declined an invitation to become a full member of Mercosur, in 1996 it signed a free trade agreement and instead became an associate member, forfeiting formal participation in the decision-making processes and the policies of the common union. Even though Chile shares strong historical ties with Brazil and Argentina and is also part of the Southern Cone. Strategic international matters and internal political tensions led Chile to decide not to become a full member of Mercosur.

11. Taken from CIA World Factbook site http://www.cia.gov/cia/publications/factbook on June 17, 2005.

12. For a description of data sources, see the Technical Appendix at the end of the volume.

13. From the numbers in Table 1: $12\% = (4{,}421 + 4{,}836 + 1{,}869)/93{,}425$; $19\% = (17{,}211 + 5{,}125 + 4{,}958)/145{,}701$.

14. The average distance of trade for each region is defined as in Carrere and Schiff (2004), as the weighted average distance of trade for every pair of trading countries, where one or both of the countries belongs to the region. To account for the relative importance of some trading partners over others, it uses as weights, the ratio between the bilateral trade of the country pair and the total bilateral trade of the region.

15. This strange result can be better understood by observing that the fall of the average trading distance at country level is mostly due to the increasing intra-continental trade. Moreover, while the intra-continental trade is happening at increasingly shorter distance, the reverse is true for the extra-continental trade.

16. Anderson and van Wincoop (2003) advocate for the model of Anderson (1979) as a theoretical foundation for the gravity equation. They criticize the "traditional gravity" equation as misspecified for ignoring the "multilateral resistance" of each particular country in the estimation of bilateral trade. The notion of "multilateral resistance" can be illustrated as follows: One should expect that Australia and Indonesia trade more with each other than predicted by the "traditional" gravity equation, simply because the later does not incorporate the fact that Australia is relatively close to Indonesia but at the same time away from the rest of the world.

17. For a list of developing countries, see Table 1 of the Technical Appendix at the end of the volume.

18. Columns 1 and 2 of Table 2 only present the results of the model that includes country-fixed effects. Results without country-fixed effects are qualitatively the same and can be obtained from the authors upon request.

19. Comparing between the exponential of the estimated coefficients of the *Common RTA* variable in the models 1 and 2 on Table 2: exp(1.706)/exp(0.221) = 4.4.

20. 32% = 1−exp(0.39). Models 3 and 4 were regressed without country-fixed effects. To include country-fixed effects will mislead the estimation of the South American effect as they are highly collinear with the South America fixed effect.

21. From the estimators of Column 5 of Table 2: $-80\% = (3{,}000/1{,}000)^{(-1.477)}-1$; $-84\% = (3{,}000/1{,}000)^{(-1.477-0.191)}-1$.

22. From the estimators of Column 5 of Table 2: 88% = exp(0.635)−1; 16% = exp(0.635−0.487)−1.

23. 3.2 = exp(1.855)/exp(1.855−1.178).

24. From the estimators of Column 5 of Table 2: 3.86 = exp(1.36), 19.5% = exp(1.356−1.178)−1.

25. Regressing only South American trade a model specification analysis lead us to drop the following variables of the gravity equation of Rose (2004): *Curcol*, since none of the 10 South American countries is a current colony, and *Common currency*, since it's only relevant for one country pair-year in the sample (Ecuador–U.S. 2001). Besides the variables *Colonial relationship*, *Island,* and *Log_areas* are discarded for having insignificant effects on South American trade. The *Landlocked* variable, although significant, is eliminated from the model for two reasons: it alters in a confusing way, the estimators for the two landlocked countries in South America – Bolivia and Paraguay – and it is overridden by the country-fixed effects.

26. These results are robust to dropping the country-fixed effects (thus becoming the traditional gravity equation), to dropping Chile, the most "globalized" South American country; and to dropping Brazil, the only non-Spanish-speaking country and the largest economy. It also shows that the RTA effect is stronger in Mercosur than in the Andean Community. Those results are available from the authors upon request.

27. The results are mostly unchanged under several specifications that incorporate alternatively country-fixed effects for the non-South American countries, and the *Common RTA* variable. Those results are available from the authors upon request.

28. The average results are qualitatively the same under several specifications that incorporate or exclude alternatively country-fixed effects and a RTA variable. The reported average growth results effects are virtually unchanged by adding or excluding country fixed effects. Those results are available from the authors upon request.

29. Bolivia represented less than 0.01% of the trade of Paraguay, and vice versa, in the early 1980s.

30. Carillo and Li (2002) provide a partial answer to some of these questions, but they use a very limited version of the gravity equation.

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CHAPTER 7

INTRA-REGIONAL SALES AND PERFORMANCE OF MULTINATIONAL ENTERPRISES

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ABSTRACT

This chapter is an extension of a recent work that has examined the intra-regional sales of large multinational enterprises (MNEs). First, we examine the interaction between the performance of MNEs and four proxies for their firm-specific advantages (FSAs). This includes: firm size, knowledge (as represented by research and development (R&D)), marketing ability, and industry type. We find that FSAs in R&D and service sector type are best exploited within the home region. In contrast, the FSA firm size is better exploited by global and bi-regional firms. Second, we find that a service MNE tends to be more home-region oriented and has a higher proportion of intra-regional sales than a manufacturing firm.

According to Rugman and Verbeke (2004), much economic activity is location bound and takes place in clusters of the broad "triad" regions of North America, the European Union (EU), and Asia. More specifically,

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most of the world's 500 largest firms are not global and an average 70% of their sales is in their home region of the triad. This regional concentration of sales has important implications for the concept of the geographic reach of firm-specific advantages (FSAs), as suggested by Rugman (2005).

The FSAs stem from the firm's proprietary assets that arise due to production or marketing activities (Rugman, 1981b). There is a large body of literature which examines the relationship between FSAs and a firm's degree of multinationality, especially a firm's levels of foreign direct investment (FDI) (e.g., Hennart, 1986; Grubaugh, 1987; Morck & Yeung, 1992). However, these studies neglect to address the following issues:

First, many previous studies generally examine the relationship of the FSAs and the firm's level of FDI, i.e., the MNE's upstream production activity. Most empirical studies, however, fail to address the effect of these FSAs on downstream activities. According to Rugman (2005), FSAs not only affect the firm's upstream activity, such as the level of FDI, but also affect its downstream activities.

Second, most previous empirical studies fail to address the effect of FSAs on a firm's regional sales. Most of the 500 largest MNEs are not global in the sense of having the ability to sell the same products and services around the world (Rugman & Brain, 2003; Rugman & Verbeke, 2004; Rugman, 2005). Accordingly, a regional analysis rather than a global one is needed.

Finally, most previous empirical studies fail to distinguish the FSAs based on their geographic reach. Rugman (2005) suggests that the firm's FSAs can be exploited either regionally or globally. For example, national patent or regional EU "eco" labels affect the regional reach of the FSAs. In order to achieve global reach, the FSA has to become a global standard or global brand. It should also have the global benefits of integration, with economies of scale and scope.[1]

To address these issues, this study tests (1) whether each FSA (including firm size, knowledge, marketing ability, and industry type) exhibits any home-region geographic bias or non-home-region geographic bias; and (2) the effect of each of the FSAs on a firm's regional sales.

This chapter is organized into seven main sections. The first section is the literature review. The second section states the main hypothesis and a proposition. The third section explains the econometric models and describes measures of variables used in the analysis. The fourth section describes data sources and the sample used in the chapter. The fifth section shows and analyzes the results of the test. The sixth section describes the limitations of the chapter. The last section provides conclusions of the chapter.

1. LITERATURE REVIEW

According to the existing theories of MNEs, FSAs are important factors in determining the performance of MNEs (Rugman, 1981b). The resource-based view also suggests that a firm's unique resources and heterogeneous capabilities can generate competitive advantages, which can lead to sustainable superior returns (Barney, 1991; Rugman & Verbeke, 2002). These resources may include brand names, skilled labor, knowledge of technology, and efficient production processes (Wernerfelt, 1984).

Internalization theory suggests that internalization can occur in response to imperfections and externalities in the goods and factor markets (Rugman, 1981b). According to Hennart (2001), these externalities can come from structural market imperfections (as suggested by Hymer, 1960) and natural market imperfections (as suggested by Rugman, 1981b). Hymer's analysis of structural market imperfections is consistent with Bain-type advantages to enhance the asset power of the MNEs (Dunning & Rugman, 1985). A firm's asset power could be partly reflected by firm size since resources are needed in absorbing the high costs of marketing, for enforcing patents and contracts, and for achieving economies of scale (Agarwal & Ramaswami, 1992; Hood & Young, 1979). According to Grubaugh (1987), Hymer's analysis also emphasizes the importance of the industry sector a firm is in.

Rugman and Verbeke (2003) integrate FSAs and internalization theory with the resource-based view. They suggest that "in more general terms, FSAs should be viewed as knowledge bundles that can take the form of the intangible assets, learning capabilities, and even privileged relationships with outside actors" (Rugman & Verbeke, 2003, p. 127).

In a regional context, Rugman (2005) proposes the two-by-two regional matrix representing the interaction between the geographic reach of the FSAs (regional or global) and the geographic scope of the locational advantages (regional or global). According to Rugman (2005), only firms with the global reach of FSAs and global scope of locational advantages can be defined as global firms. However, most of the largest companies are regional firms in the sense of having a regional reach of FSAs and a regional scope of locational advantages. Some companies may have a global reach of FSAs, but the geographic scope of locational advantages is regional. These firms can be bi-regional (having at least 20% of their sales in two regions of the triad, but less than 50% in any one region). However, it is difficult to find firms with a regional reach of FSAs and a global scope of locational advantages.

Many empirical studies use various intangible assets as proxies for FSAs (e.g., Rugman, 1981a; Hennart, 1986; Grubaugh, 1987; Morck & Yeung, 1991). Such intangible assets are commonly thought to include technological know-how, marketing ability and related consumer goodwill, and effective and dedicated management (Helpman, 1984; Morck & Yeung, 1992).

The most common empirical proxy for technological know-how in the literature is research and development (R&D) expenditure or R&D intensity, such as R&D per sales and R&D per assets (see e.g., Rugman, 1981a; Grubaugh, 1987; Morck & Yeung, 1992). Most studies utilize advertising expenditures or advertising intensity, such as advertising per sales or advertising per assets, as a proxy for marketing ability and related consumer goodwill (e.g., Morck & Yeung, 1992). Grubaugh (1987) uses sales and general administrative expenses as a proportion of total sales as a proxy for marketing ability (or advertising intensity in Grubaugh's 1987 paper). Due to the fact that it is difficult to define variables reflecting effective and dedicated management, different studies use different proxies for management quality. Morck and Yeung (1992), for example, use a fraction of the firm's outstanding equity held by insiders (INS) as a proxy for effective management. Caves (1974), on the other hand, has non-production workers in total employment and average earnings per employee as proxies for management quality. Pugel (1978) measures management ability according to the share of managers in total employment.

Some studies incorporate firm size as one of the FSAs. The proxies used for firm size include a firm's assets and its sales (e.g., Horst, 1972; Grubaugh, 1987). Moreover, Ray (1989) states that the relationship between level of FDI and firm size cannot be assumed to be linear. Kimura (1989) uses the log of the firm's domestic merchant sales as a proxy for firm size.

2. HYPOTHESIS AND EMPIRICAL PROPOSITION

According to the evidence that most of the world's 500 largest firms have the vast majority of their sales within their home region of the triad, Rugman and Verbeke (2004) demonstrate that the lack of global market activity can be interpreted as a reflection of the limits to the international transferability of a company's FSAs. Anand and Delios (1997) suggest that the transferability of resources could be restricted by the physical boundedness of FSAs or by the applicability of FSAs in the host country environment. That is, there exist location-specific capabilities for firms engaging in international expansion.[2]

According to Hitt, Hoskisson, and Kim (1997), although international expansion can provide greater opportunities to achieve economies of scales, to leverage strategic resources and achieve economies of scope, and to exploit market imperfections across countries, it is also associated with significant costs. Based on transaction cost theory, multinational involvement can generate significant transaction costs and information-processing demand (Jones & Hill, 1988; Hitt, Hoskisson, & Ireland, 1994). Zaheer and Mosakowski (1997) propose that a firm operating abroad may encounter the liability of foreignness, "a comparative disadvantage compared to a local firm in a country" (Zaheer & Mosakowski, 1997, p. 440).

In a regional context, Rugman and Verbeke (2004) suggest that firms trying to expand their sales from the home region of the triad to other regions may face liabilities of inter-regional foreignness (such as trade regulations, powerful foreign rivals in other regions, and local product preferences) so that they cannot repeat their home-triad base advantages in the two other triad markets. Indeed, the evidence is that most available FSAs might well be realized and exhausted within the home region of the triad itself. However, no formal test has been conducted to explore the geographic reach of FSAs. Accordingly, this chapter examines whether the benefits of each FSA (including firm size, knowledge, marketing ability, and industry type) can be realized within the home region of the triad. This leads to the main hypothesis of the chapter.

Hypothesis 1. Each FSA could be exploited more efficiently in the home region of the triad than in other regions.

In this study, a distinction is made between home-region bound FSAs and non-home-region-bound FSAs. Home-region-bound FSAs are those whose geographic reach is limited to the home region. In other words, these FSAs can be exploited more efficiently in the home region. Non-home-region bound FSAs are those whose geographic reach is not limited to the home region; that is, these FSAs can be exploited both in the home region and beyond the home region.

After testing whether each FSA exhibits any home-region geographic bias or whether each FSA can be exploited more efficiently in the home region, the next step is to examine the effect of each FSA on a firm's regional sales to test whether a firm indeed exercises each of these FSAs within the home-region. This leads to the empirical proposition 1.

Empirical Proposition 1. If the benefits of any of the FSAs could be realized within the home region of the triad, it is expected that a firm with a greater level of that FSA tends to have a higher proportion of intra-regional sales than a firm with a lower level of such an FSA.

3. ECONOMETRIC MODELS AND MEASURES

To test hypothesis 1, the model can be estimated by regressing a firm's performance on those FSAs, and the interaction between each FSA and the dummy, whether a firm is in a home-region oriented category (*HOMEdummy*, the variable will have a value of 1 if a firm has at least 50% of its sales in its home region of the triad and a value of zero otherwise). The estimation can be written in the following equations:

$$\begin{aligned} performance = {} & \beta_0 + \beta_1 firm\_size + \beta_2 knowledge + \beta_3 marketing\_ability \\ & + \beta_4 industry\_type + \beta_5 firm\_size \bullet HOMEdummy \\ & + \beta_6 knowledge \bullet HOMEdummy + \beta_7 marketing\_ability \bullet HOMEdummy \\ & + \beta_8 industry\_type \bullet HOMEdummy + \beta_9 HOMEdummy + \varepsilon \end{aligned} \quad (1)$$

where ε stands for the error term.

The firm's performance is measured by a firm's return on equity (*ROE*). Firm size is measured by a firm's log of total asset (*logasset*). Knowledge is measured by a firm's R&D expenditures as a proportion of total sales (*RDpsale*). Marketing ability is measured by the firm's selling and general administrative expenses as a proportion of total sales (*selladminpsale*). Industry type is identified by a dummy of whether a firm is in the manufacturing industry or service industry (*servicedummy*); (see Table 1 for a detailed description of the variables used in the analysis, and see Table 2 for the descriptive statistics and the correlations of the variables).

The ordinary least squares (OLS) method is used to estimate the model in Eq. (1). If the coefficient on the interaction term between any FSA and *HOMEdummy* is significant, it can be interpreted that the effect of that FSA on a firm's performance depends on whether a firm is home-region oriented. Moreover, if the coefficient has a positive value, this implies that that FSA can be exploited more efficiently in the home region of the triad than in other regions. If this is the case, then FSA would be defined as a home-region bound FSA. In contrast, if the coefficient on the interaction term is negative and significant, the FSA would be defined as a non-home-region bound FSA.

To test the empirical proposition 1 or to examine the effect of each FSA (including firm size, knowledge, marketing ability, and industry type) on a firm's regional sales, the estimation can be written in the following equation:

$$\begin{aligned} regionsales = {} & \beta_0 + \beta_1 firm\_size + \beta_2 knowledge + \beta_3 marketing\_ability \\ & + \beta_4 industry\_type + \beta_5 NAdummy + \varepsilon \end{aligned} \quad (2)$$

where ε stands for the error term.

Table 1. List of Variables used in the Estimation.

Variables	Explanation
ROE	Return on equity = (net income−preferred dividend)/common equity
regiontypes	Categorical variables Home-region oriented group: firms having at least 50% of their sales in their home region of the triad of North America, Europe, and Asia Host-region oriented group: firms having at least 50% of their sales in a triad market other than their home region Bi-regional group: firms having at least 20% of their sales in each of two regions of the triad, but less than 50% in any one region Global group: firms having at least 20% in each part of the triad, but less than 50% in any one region
logasset	Log of total assets (millions of dollars)
selladminpsale	Selling and general administrative expenses as a proportion of total sales
RDpsale	Research and development expenses as a proportion of total sales
servicedummy	Dummy 1 if the firm is a service firm
HOMEdummy	Dummy 1 if the firm is home-region oriented
logassetHOME	*logasset* × *HOMEdummy*
adpsaleHOME	*adpsale* × *HOMEdummy*
RDpsaleHOME	*RDpsale* × *HOMEdummy*
serviceHOME	*Servicedummy* × *HOMEdummy*
INTRA	Proportion of a firm's intra-regional sales
NAdummy	Dummy 1 if the nationality of a firm is in North America

Note: The total sales data used to calculate *selladminpsale* and *RDpsale* are derived from the variable *RevenueCOMPUSTAT*. The original selling and general administrative expenses data item from COMPUSTAT database normally includes R&D expenses. The selling and general administrative expenses used here are obtained by subtracting the R&D expenses from the original one.

The dependent variable *regionsales* represents a firm's regional sales. This can be measured with three proxies. The first proxy is the four types of firms as classified by Rugman (2005), including home-region oriented firms, bi-regional firms, host-region oriented firms, and global firms, denoting this

Table 2. Means, Standard Deviations, and Correlations.

Variables	Mean	Standard Deviation	1	2	3	4	5	6
1. *ROE*	0.10	0.33						
2. *INTRA*	0.70	0.21	0.13					
3. *HOMEdummy*	0.79	0.41	0.05	0.69*				
4. *logasset*	9.98	0.94	−0.16	−0.26*	−0.16			
5. *RDpsale*	0.04	0.06	0.01	−0.50*	−0.35*	0.19		
6. *selladminpsale*	0.16	0.10	0.14	−0.17	−0.15	0.15	0.32*	
7. *servicedummy*	0.32	0.47	−0.04	0.60*	0.29*	−0.22*	−0.41*	0.14

Note: *means p-value < 0.05.

variable as *regiontypes*.[3] With this proxy, a model could be estimated using the multinomial logit method. With this method, the effect of FSAs can be compared across firms with different geographic sales structures. The most interesting comparisons would be those with home-region oriented firms as a comparison group; that is, the effect of FSAs of host-region oriented vs. home-region oriented firms; bi-regional vs. home-region oriented firms; and global vs. home-region oriented firms. In this case, it is expected that a firm possessing a high value of home-region bound FSAs tends to be a home-region oriented firm rather than a host-region oriented firm, a binary firm, or a global firm. The opposite would occur for the firms with a high value of non-home-region bound FSAs.

The second proxy for regional sales is a binary variable regarding whether a firm is of a home-region oriented type (*HOMEdummy*). In this case, the logit method could be used to estimate the effect of each FSA on a firm's propensity to be home-region oriented. It is expected that a firm with a higher value of home-region-bound FSAs has a greater possibility of being a home-region oriented firm than a non-home-region oriented one.

The last proxy for regional sales is a continuous variable of the firm's intra-regional sales as a proportion of total sales (*INTRA*). With this proxy, the OLS method could be used to estimate the relationship between the FSAs and a firm's proportion of intra-regional sales. However, Wooldridge (2001) argues that using the OLS method to estimate the model with proportion (in this case "*INTRA*") as a dependent variable has two limitations. First, the OLS predicted value of proportional change might lie outside the unit interval. Second, the OLS model implies that a ceteris paribus unit increase in each independent variable always changes the dependent variable in the same amount, regardless of the initial value of the independent variable. He suggests that this implication cannot be true because continually increasing one unit of the independent variable would eventually drive the dependent variable to be greater than one or less than zero. Accordingly, this chapter also uses the fractional logit estimation to estimate the effect of FSAs on a firm's proportion of intra-regional sales. It is expected that a firm with a higher value of home-region-bound FSAs tends to have higher proportion of intra-regional sales than other firms with a lower level of this kind of FSAs.

To examine the effect of each FSA on a firm's regional sales, the model also controls for the effect of the firm's region of origin, that is, market effect. Due to the fact that North America is the largest market among the broad triad region, it is expected that all other things being equal (if firms possess the same level of FSAs), the North American firms tend to have more sales within their home region than firms of other regions. Accordingly, the dummy variable defining when a firm is a North American firm (denoted by *NAdummy*) is included in the model.

4. DATA SOURCES AND SAMPLE

This chapter uses two databases for the analysis: (1) the "Regional Nature of Global Multinational Activity" (the RNGMA database), the same database used in Rugman (2005); and (2) the industrial annual section of the Standard & Poor's COMPUSTAT North America database provided by Wharton Research Data Services.[4]

The first database, covering the world's 500 largest companies according to the "*Fortune* Global 500" (2002), contains year 2001 data on firms' total revenues (denoted by *revenueRNGMA*); regional sales in the triad region of North America, Europe, and Asia; proportion of intra-regional sales (denoted by *INTRA*); the type of industry the firms are in (manufacturing or services, denoting this variable as *servicedummy*); and the firms' region of origin.

The second database provides financial statistics and market information covering publicly traded companies in the United States and Canada. It provides year 2001 data on firms' consolidated net income, common equity, total sales (denoted by *revenueCOMPUSTAT*), total assets, selling and general administrative expenses, and R&D expenditures.

According to the RNGMA database, of the 500 largest firms, 380 firms have intra-regional sales data available. The industrial annual section of the COMPUSTAT North America database contains multiple entries. In order to align the 380 firms in the RNGMA database with firms in the

COMPUSTAT North America database; company names, firms' stock ticker symbols (available for some firms in the RNGMA database, but available for all firms in the COMPUSTAT North America database), and firms' revenues (available in both databases) are compared between the two databases. In the process of comparison, out of 380 firms in the RNGMA database, only 253 firms have similar names or similar stock ticker symbols with available revenue data in the COMPUSTAT North America database. For these reasons, only 253 firms are left for further comparison.

Due to the fact that each database may have different methods of collecting and reporting the data, all 253 firms in the RNGMA database are needed to compare their revenues with firms in the COMPUSTAT North America database in order to obtain consistent data between the two databases. The percentage differences between revenues of the RNGMA and those of the COMPUSTAT North America databases (denoted by *percentdifferent*) are calculated by the following formula:

$$percentdifferent = \frac{revenueCOMPUSTAT - revenueRNGMA}{revenueRNGMA} \times 100 \qquad (3)$$

where *revenueCOMPUSTAT* is the revenue data derived from the COMPUSTAT North America database, and *revenueRNGMA* the revenue data derived from the RNGMA database.

If the firms have high value of "*percentdifferent,*" it implies that those firms in the two databases might be different or both databases may have very different methods of collecting and reporting the data. For these reasons, a cut-off point of "*percentdifferent*" is needed in order to determine which firms should be included for further analysis. The + 3 threshold is chosen as a cut-off point; that is, firms with value of "*percentdifferent*" greater than 3 or less than −3 are eliminated from the database. Then, out of 253 firms, 206 firms are left for further analysis. This threshold is chosen because the new 206 firms' database and the original 380 firms' database have a similar percentage of each type of firms (home-region oriented, host-region oriented, bi-region, global firms, and insufficient data to identify the type of firms); and they are in exactly the same order.

Out of 206 firms, 11 do not have sufficient data to determine the type of firms based on their regional sales (*regiontypes*). Therefore, only 195 firms are left for further analysis. Out of 195 firms, after eliminating firms without data on at least one of the following three variables: *ROE*, *selladminpsale*, and *RDpsale*, 87 firms are used for the final analysis.

5. RESULTS

Table 3 reports the results of the OLS estimations of the effects of FSAs and their interactions with *HOMEdummy* on a firm's performance (measured by *ROE*). The hypothesis that all interaction terms' coefficients equal zero can be rejected at the 5% significant level. This implies that the overall effects of all FSAs on a firm's performance depend on whether a firm is home-region oriented. Each of the interaction term coefficients except that of "*selladminpsaleHOME*" is statistically significant at the 5% or 10% significant

Table 3. The OLS Estimation of the Effect of FSAs and the Interaction Terms on a Firm's Performance.

Dependent Variable: *ROE* ($ per share)	*ROE*
Independent variables	
logasset	0.0218
	(0.66)
selladminpsale	1.8074**
	(3.59)
RDpsale	−1.7908**
	(−2.94)
servicedummy	−0.7633**
	(−4.08)
logassetHOME	−0.1096*
	(−1.82)
selladminpsaleHOME	−1.1002
	(−1.57)
RDpsaleHOME	1.7589*
	(1.78)
serviceHOME	0.6675**
	(3.23)
HOMEdummy	1.2306**
	(2.08)
Constant	−0.3222
	(−0.88)
Number of observations	87
R^2	0.1064
Test of all interaction terms:	
F-statistic	2.86
p-value	0.0288**

Note: Values in the parenthesis are the Huber–White robust *t*-statistic value.
**means p-value < 0.05.
*means p-value < 0.10.

level. Because the coefficient on *selladminpsaleHOME* is not significant at the 10% significant level, the null hypothesis that the effect of *selladminpsale* on performance does not depend on whether a firm is home-region oriented cannot be rejected. However, the results show that variables *logassetHOME*, *RDpsaleHOME*, and *serviceHOME* are negatively, positively, and positively related to *ROE*, respectively. It can be interpreted that the FSA *logasset* can be exploited both in the home region and beyond the home region of the triad (non-home-region bound FSA), while the FSAs *RDpsale* and *service-dummy* can be exploited more efficiently in the home region of the triad (home-region bound FSAs).

The results derived from Table 3 determine the prediction of empirical proposition 1. That is, it is predicted that a firm with a lower value of *logasset* (a small firm), a firm with a higher value of *RDpsale*, and a service firm tends to be home-region oriented or tends to have higher proportion of intra-regional sales. Then, Eq. (2) is used to test the empirical proposition 1.

To estimate Eq. (2), either *regiontypes*, *HOMEdummy*, or *INTRA* can be used as a proxy for a firm's regional sales (*regionsales*). The first analysis is to use *regiontypes* to measure *regionsales*. Table 4 reports the results of the multinomial logit estimation of the effect of all FSAs on types of firms based on their regional sales (*regiontypes*). The pseudo R^2 of the estimation is 0.3110. The results derived from the multinomial logit estimation should be analyzed with much caution because of the limitation of observation for some categories of *regiontypes*. Out of 87 overall firms; 69 firms (79.31%) are home-region oriented; 2 firms (2.30%) are host-region oriented; 12 firms (13.79%) are bi-regional; and 4 firms (4.60%) are global. Due to the fact that there are very few firms that are host-region oriented or global, high variation and reliability problems of the estimation become essential issues.

According to Table 4, the coefficient on all FSAs (*logasset*, *selladminpsale*, *RDpsale*, and *servicedummy*) for all comparison groups (host- vs. home-region oriented firms; bi-regional- vs. home-region oriented firms; and global- vs. home-region oriented firms) are not significant at the 10% significant level. Accordingly, the prediction of empirical proposition 1 cannot be supported. However, the results from Table 4 show that the coefficient on *NAdummy* in the comparison groups between bi-regional firms vs. home-region oriented firms is significant at the 5% significant level with negative value. That means all things being equal (each firm possesses the same level of all FSAs), the North American firm tends to be a home-region oriented firm rather than a bi-regional firm.

Next, a binary variable *HOMEdummy* is used as a proxy for *regionsales* for the model in Eq. (2). Table 5 reports the results of the logit estimation of

Table 4. The Multinomial Logit Estimation of the Effect of FSAs on Types of Firms.

Comparison Group	Host-Region Oriented Firms vs. Home-Region Oriented Firms	Bi-Regional Firms vs. Home-Region Oriented Firms	Global Firms vs. Home-Region Oriented Firms
Variables			
logasset	3.2385	−0.2422	0.4660
	(1.08)	(−0.44)	(0.69)
selladminpsale	10.7067	−0.1325	5.4501
	(0.77)	(−0.03)	(1.06)
RDpsale	40.3395	10.6435	10.8546
	(1.13)	(1.55)	(1.18)
servicedummy	−34.9556	−35.4505	−0.5294
	(0.00)	(0.00)	(−0.36)
NAdummy	−37.3693	−2.0888**	−1.3983
	(0.00)	(−2.70)	(−1.19)
Constant	−41.4907	1.9290	−8.1927
	(−1.09)	(0.34)	(−1.10)
Number of observations	87		
Log likelihood	−41.0873		
Model χ^2	37.09		
Significance of model	0.0012		
Pseudo χ^2	0.3110		
The likelihood-ratio test (LR-test) for the coefficient on each FSA			
χ^2 statistics for coefficient on *logasset*	4.21		
χ^2 statistics for coefficient on *selladminpsale*	1.79		
χ^2 statistics for coefficient on *RDpsale*	5.00		
χ^2 statistics for coefficient on *servicedummy*	7.75*		
χ^2 statistics for coefficient on *NAdummy*	14.26**		

Note: Values in the parenthesis are the *z*-statistic value.
**means p-value < 0.05.
*means p-value < 0.10.

the effect of FSAs on *HOMEdummy* (see column 1 of Table 7 for the results of marginal effects of each FSA on *HOMEdummy*). The results show that the coefficient on *servicedummy* is significant at the 5% significant level with

Table 5. The Logit Estimation of the Effect of FSAs on *HOMEdummy*.

Dependent Variable: *HOMEdummy* (0 or 1)	Coefficient
Independent variables	
logasset	−0.0976
	(−0.26)
selladminpsale	−1.7890
	(−0.48)
RDpsale	−10.1281*
	(−1.85)
Servicedummy	2.1246**
	(2.19)
Nadummy	2.0803**
	(3.32)
Constant	1.5133
	(0.38)
Number of observations	87
Pseudo R^2	0.2903

Note: Values in the parenthesis are the Huber–White robust *t*-statistic value.
**means p-value <0.05.
*means p-value <0.10.

positive value. That is, a service firm is more likely to be home-region oriented than a manufacturing firm. This result supports the prediction of the empirical proposition 1 based on the home-region-bound nature of the FSA *servicedummy*. In other words, firms tend to exercise the FSA *servicedummy* based on its geographic reach. According to Table 5, the coefficient on *RDpsale* is significant at the 10% significant level with negative value. That is, a firm with higher level of *RDpsale* is less likely to be home-region oriented. This result does not support the prediction of the empirical proposition 1 based on the home-region bound nature of the FSA *RDpsale*. This means that most firms with higher levels of *RDpsale* try to exercise the FSA *RDpsale* both in the home region and beyond the home region of the triad without realizing that indeed the FSA *RDpsale* can be exploited more efficiently in the home region of the triad itself.

Finally, the dependent variable in Eq. (2) is measured by the continuous variable *INTRA*. The results of Table 6 (column 1 demonstrates the OLS estimation and column 2 demonstrates the fractional logit estimation) show that among the coefficients on all four FSAs, only the coefficient on *RDpsale* and *servicedummy* are significant at the 5% significant level with negative

Table 6. The OLS and Fractional Logit Estimation of the Effect of FSAs on a Firm's Proportion of Intra-Regional Sales (*INTRA*).

Dependent Variable: *INTRA* (between 0 and 1)	*INTRA* (OLS)	*INTRA* (fractional logit)
Independent variables		
logasset	0.0027	−0.0319
	(0.15)	(−0.30)
selladminpsale	−0.2224	−1.2332
	(−1.13)	(−1.13)
RDpsale	−0.8911**	−3.6957**
	(−2.90)	(−2.65)
servicedummy	0.2126**	1.3174**
	(6.13)	(4.92)
NAdummy	0.1555**	0.7292**
	(3.91)	(4.19)
Constant	0.5555**	0.6677
	(2.75)	(0.58)
Number of observations	87	87
R^2	0.5598	0.5389

Note: Values in the parenthesis are the Huber–White robust *t*-statistic value.
**means p-value <0.05.

and positive value, respectively (see column 2 of Table 7 for the results of the marginal effects of each FSA on *INTRA* using the fractional logit model). That is, a firm with higher level of *RDpsale* tends to have lower proportion of intra-regional sales than a firm with lower level of *RDpsale*, and a service firm tends to have higher proportion of intra-regional sales than a manufacturing firm. These results are similar to the results of Table 5; therefore, the implications of the results of the two tables regarding the FSAs *RDpsale* and *servicedummy* are similar.

Moreover, the results from Tables 5 and 6 (both columns 1 and 2) show that the effects of *NAdummy* on a firm's regional sales (*HOMEdummy* and *INTRA*) are significant at the 5% significant level with positive value. That means that the North American firm is more likely to be a home-region-oriented firm and tends to have a higher proportion of intra-regional sales. These results are consistent with the prediction that all things being equal, the North American firms tend to have more sales within their home region, the largest market among all the three triad regions, than firms of other regions.

However, Tables 5 and 6 (both columns 1 and 2) show the same results that the coefficient on variable *logasset* is not significant at the 10% significant

Table 7. The Marginal Effects of each FSA on *HOMEdummy* (logit model) and *INTRA* (fractional logit model).

Dependent Variable: *HOMEdummy* and *INTRA*	*HOMEdummy* (logit)	*INTRA* (fractional logit)
Independent variables		
logasset	−0.0097	−0.0064
	(−0.26)	(−0.30)
selladminpsale	−0.1773	−0.2461
	(−0.45)	(−1.13)
RDpsale	−1.0040*	−0.7376**
	(−1.80)	(−2.66)
servicedummy	0.1704**	0.2328**
	(2.67)	(6.51)
NAdummy	0.2996**	0.1553**
	(2.47)	(3.88)
Number of observations	87	87

Note: Values in the parenthesis are the Huber–White robust *z*-statistic value.
**means p-value<0.05.
*means p-value<0.10.

level (similar to the results derived from Table 4). Accordingly, the prediction that a firm with a lower value of *logasset* tends to be home-region oriented or tends to have a higher proportion of intra-regional sales cannot be supported.

6. LIMITATIONS

This chapter has some limitations. First, due to the fact that the RNGMA database has available data on intra-regional sales only for year 2001, the data used for the analysis are cross-sectional. This generates limitations to analyze the relationship between a firm's FSAs, intra-regional sales, and performance across time. Accordingly, a time wise analysis would be a logical next step for future research.

Second, out of 87 firms used in the analysis, there are 64 firms from North America; 22 firms from Europe; no firms from Asia or Asia-Pacific; and only 1 firm from *OTHER* (regions other than North America, Europe, Asia and Asia Pacific, Europe/*OTHER*). The small number of observations from *OTHER* and the absence of observations from Asia and Asia-Pacific are due to two factors. The first is that most of the Asian firms and firms from *OTHER* fail to report information that can be used in this analysis. Moreover, this chapter derives most of the independent variables from the COMPUSTAT North America database. This database covers only publicly traded companies in the United States and Canada, and most of these companies are North American or European firms. Moreover, among the 87 firms included in the analysis, none of these firms is in banking or other financial services industries. For these reasons, the interpretation of results is based almost entirely on North American and European firms and do not cover banking and other financial services industries.

Finally, this chapter does not incorporate any analysis of a firm's structure and its managerial capability. This is a distinct limitation of studies using secondary data. Accordingly, future research may try to collect data regarding a firm's structure and its managerial method from primary sources and incorporate these variables in the analysis.

7. CONCLUSIONS

The main contribution of this study is to test the regional nature of MNEs as it affects a firm's international strategies. Rugman and Verbeke (2004) proposed that the lack of global expansion among large MNEs could be attributed to the problem of international transferability of the firms' FSAs, but they only investigated the geographic sales of MNEs. This is the first empirical study to test whether the benefits of each FSA (including firm size, knowledge, marketing ability, and industry type) can be realized within the home region of the triad itself. We explore the effect of each FSA on a firm's regional sales, as measured by its proportion of intra-regional sales and other variables indicating whether it is a home-region oriented firm in contrast to a host-region oriented, bi-regional, or global firm.

First, we find that some FSAs can be exploited effectively only in the home region (R&D and service sector type), and one FSA can be exploited both in the home region and in other regions (firm size). Second, we find that a service firm tends to be home-region oriented or tends to have higher proportion of intra-regional sales than a manufacturing firm. Finally, we find that most firms do not exercise its FSA knowledge based on its geographic reach. That is, a firm with higher levels of R&D tends to use their knowledge both in the home region and beyond the home region of the triad without realizing that indeed they can exercise the knowledge from R&D more effectively in the home region of the triad itself.

Future research on international business should pay more attention to the differences in terms of the geographic reach of each FSA when analyzing the effect of FSAs on any firm's policy and strategic decisions. Attention to regional strategy rather than global strategy is also needed.

NOTES

1. In a related work, Erramilli, Agarwal, and Kim (1997) conduct an empirical study to examine the subsidiary ownership preferences among Korean MNEs. They found that the influence of FSAs (including technological intensity, product differentiation, and capital intensity) on subsidiary ownership levels depends on whether the subsidiary is located in a relatively less developed or more developed country than the home country. Although the study tests the effect of FSAs (contingent upon location of the subsidiary) on a firm's levels of subsidiary ownership decision, it does not examine the effect of these FSAs on the MNE's downstream activity and does not examine the geographic reach of these FSAs.

2. Anand and Delios (1997) suggest that a firm's FSAs could be local in scope. However, they do not directly examine the geographic reach of each of the firm's FSAs. Instead, they measure a firm's location-specific capabilities by the proportion of production that must occur at the time of consumption (S-factor), and examine the effect of the S-factor on the choice of foreign entry mode (acquisition, joint venture, and greenfield) and subsidiary performance, using the sample of Japanese FDI data from the wholesale and retail industries. They find that "entry in industries in which the foreign parent's resources and capabilities were not transferable to the host country increased location-specific disadvantages and impeded the frequency and efficacy of entry by greenfield" (Anand & Delios, 1997, p. 598).

3. According to Rugman (2005), firms are categorized as home-region oriented firms if they have at least 50% of their sales in their home region of the triad of North America, Europe, and Asia; host-region oriented firms if they have at least 50% of their sales in a triad market other than their home region; bi-regional firms if they have at least 20% of their sales in each of two regions of the triad, but less than 50% in any one region; and global firms if they have at least 20% in each part of the triad, but less than 50% in any one region.

4. Wharton Research Data Services provide both the COMPUSTAT North America and the COMPUSTAT Global databases. The former is a database of financial, statistical, and market information covering publicly traded companies in the U.S. and Canada, whereas the latter provides authoritative financial and market data covering publicly traded companies in more than 80 countries (Wharton Research Data Services, 2001). However, not all firms in the COMPUSTAT North America database are included in the COMPUSTAT Global database. It appears that the COMPUSTAT North America database contains more firms from the "*Fortune* Global 500" than the COMPUSTAT Global database. Accordingly, this chapter obtains data from the industrial section of the COMPUSTAT North America database rather than the COMPUSTAT Global database. Although some companies are available in the COMPUSTAT Global database but not in the COMPUSTAT North America database, only three of them, including Assicurazioni Generali, Tesco, and BHP

Billiton, have "*percentdifferent*" between -3 and $+3$. The *percentdifferent* in this context is calculated by

$$percentdifferent = \frac{revenueCOMPUSTATglobal - revenueRNGMA}{revenueRNGMA} \times 100$$

where *revenueCOMPUSTATglobal* is the revenue data derived from the COMPUSTAT Global database, and *revenueRNGMA* the revenue data derived from the RNGMA database.

However, these firms do not have data on at least one of the two independent variables, selladminpsale and RDpsale, available. Accordingly, the three firms from the COMPUSTAT Global database will not be included for the analysis of this study.

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CHAPTER 8

FREE TRADE AGREEMENT AMONG CHINA, JAPAN, AND KOREA

Heejoon Kang

ABSTRACT

China, Japan, and South Korea have been discussing and investigating, through communiqués and their governmental research institutes, the feasibility of a free trade agreement (FTA) among them. Separately, Japan and Korea have announced that they will finalize an FTA by the end of 2005. A China and Korea FTA may follow. For all three countries, and for Korea particularly, a tripartite FTA, termed here FEAFTA (Far Eastern Asia Free Trade Agreement), will be the best arrangement to truly reduce trade barriers in all sectors including agricultural industry. Statistical analysis shows that trade and gross domestic product (GDP) (particularly for Korea) will increase substantially. The trade talk background, trade negotiations, trade issues, and the impacts of such an FEAFTA are discussed.

Free trade agreements (FTAs) are rapidly proliferating among Asian countries. For instance, Japan is actively negotiating with Mexico, Singapore, and Korea. When President Roh of South Korea made a series of state

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visits, he proposed possible FTAs with numerous host countries including Singapore, India, Vietnam, and Argentina. China wants to establish FTAs with the ASEAN (Association of South East Asian Nations) as well as with Korea. China, Korea, and Japan have been jointly investigating the feasibility of a tripartite FTA for some time. In this chapter, I will investigate the desirability and likelihood of an FTA among China, Japan, and Korea and its impact on the rest of the world in general and on the U.S., NAFTA (North America Free Trade Agreement), and Far Eastern Asian countries in particular. Recently, the leaders of China, Japan, and Korea have renewed their determination to initiate talks toward an FTA. Below, I will refer to it as Far Eastern Asia Free Trade Agreement or FEAFTA.

I will take two approaches. The first makes use of a statistical analysis method to quantify the impact of such an arrangement on world trade. What will happen to trade among member countries? What will happen to trade between member countries and non-member countries, in particular, the United States and the NAFTA? The second makes use of a case study method to investigate how these three countries view a new trade arrangement and how they will prepare for the coming trade talks. An investigation of official government position documents and other academic research papers will be made to understand how the three countries rationalize FEAFTA, how they will prepare for it, and what they want to accomplish through the agreement. These two approaches will complement each other in comprehending the nature of FEAFTA and its impact on world trade.

1. BACKGROUND

Trades among the FEAFTA countries, between FEAFTA and NAFTA, and between FEAFTA and the European Union (EU) are as follows:

Year	FEAFTA	FEAFTA and NAFTA	FEAFTA and EU
1990	96,162	442,701	267,793
1995	247,199	660,348	390,045
2000	337,883	853,160	477,166
2001	329,701	785,902	455,348
2002	378,071	827,392	423,237

Trade data shown above are averages of four measures of exports and imports reported by each trading partner, in millions of U.S. dollars, from the 2003 Direction of Trade Statistics (DOTS).

In 1990, before joining the World Trade Organization (WTO), China did not trade much with the rest of the world. The annual growth rates for trade from 1995 to 2002 are 7.56% for FEAFTA, 3.61% for FEAFTA–NAFTA, and 1.14% for FEAFTA–EU. The large growth rate for FEAFTA is mainly because of the tremendous increase of Chinese trade in recent years. In fact, Japan has negative growth rates: −1.10% with the NAFTA and −1.50% with the EU. Those two figures for Korea are, respectively, 3.15% and 2.69%. For the trade out of and into China alone, the annual growth rates are 22.45% with the NAFTA and 6.94% with the EU.

On the other hand, populations of those regions are as follows:

Year	FEAFTA	NAFTA	EU
1990	1,301,569	359,427	355,631
1995	1,373,987	383,330	362,855
2000	1,433,015	403,394	367,913

The figures, in thousands, are from Penn World Tables. FEAFTA has almost twice the population of the NAFTA and the EU combined. In addition, the neighboring countries of FEAFTA – like Indonesia and India – have huge populations as well. Even if the EU further extends its membership in Eastern Europe and the NAFTA extends its membership in South America, the influence of FEAFTA over the world population will continue to dominate the other trade blocks.

The gross domestic products (GDP) of those regions are as follows:

Year	FEAFTA	NAFTA	EU
1990	5,674	7,387	7,884
1995	6,482	8,276	8,690
2000	7,326	10,096	9,829
2001	7,444	10,138	9,982
2002	7,554	10,363	10,083

The GDP data, in billions of 1995 U.S. dollars, are from 2002 International Energy Annual. For 1990, the GDP of West Germany is used. The annual growth rates from 1990 to 2002 are 2.76% for FEAFTA, 3.36% for the NAFTA, and 2.32% for the EU. Although the growth rate of China is 16.98% and that of Korea is 8.26%, FEAFTA's growth rate is lower than those of the NAFTA and the EU because Japan's growth rate is only 1.24%.

According to the United States Census Bureau (2003), total exports, total imports, and trade balance of U.S. merchandise, not including services, with the seven largest U.S. export countries are as follows:

	Exports, f.a.s. ($ billion)	Imports, Customs ($ billion)	Trade Balance ($ billion)
Canada	170.0	221.6	−51.7
Mexico	97.4	138.1	−40.6
Japan	52.0	118.0	−66.0
United Kingdom	33.8	42.8	−9.0
Germany	28.8	68.1	−39.3
China	28.4	152.4	−124.1
South Korea	24.1	37.2	−13.2
FEAFTA	104.5	307.6	−203.1
NAFTA	267.4	359.7	−92.3
EU	151.7	244.8	−93.1

In terms of U.S. imports, China is the second largest trading partner, Japan the fourth, and South Korea the seventh. U.S. imports from the three FEAFTA countries are already larger than the imports from the entire EU. U.S. trade with FEAFTA countries is also growing faster than that with the EU or NAFTA. As of November 2004, China and Japan have become the third and the fourth largest trading countries in the world, respectively, following the United States and Germany. Whether or not China, Japan, and South Korea will successfully negotiate FEAFTA, they are likely to remain important players in world trade. The creation of FEAFTA will enhance this role.

According to Cheong et al. (2003b, p. 57), the positions of the three regions for 2002 are, in percentages of the world, as follows:

	FEAFTA	NAFTA	EU
Population	23.6	6.8	6.1
GDP	17.7	36.7	26.8
Trade	13.2	21.1	36.8

Apart from the importance of FEAFTA to the world in general and to NAFTA in particular, a successful FEAFTA arrangement, according to Cheong et al. (2003a, p. 39, 2003b, p. 91), would increase their GDP growth rates by 0.03–1.05% for China, 0.03–0.16% for Japan, and 1.29–4.73% for

Korea. Their simulation assumes an opening of Japanese and Korean agricultural sectors. FEAFTA would, on the other hand, shrink the Korean agricultural sector by 8–10%. According to Japan's Cabinet Office estimates, cited by Cheong et al. (2003b, p. 89); however, GDP growth rates will increase by 1.3% for China, 0.2% for Japan, and by 3.2% for Korea. The increment to Japan's growth rate is small mainly because of its large economy relative to the other two countries. Korea will enjoy the largest percentage increase. Though numerical values differ, analysts report positive contributions of FEAFTA on their member countries' GDP growth rates.

In order to arrive at the successful conclusion of FEAFTA, countries have to be prepared for significant changes in their agricultural as well as manufacturing sectors. Countries should view these changes as opportunities rather than threats, as challenges and advantages rather than weaknesses and disadvantages in the long run. The protection of sunset industries will become harder and costlier as years pass and substantial reforms will be necessary for each country.

For instance, Japan and Korea share a similar tariff structure, although Japanese tariff rates are somewhat lower in fisheries and forest products. On the other hand, Chinese tariff rates are substantially higher than Japanese and Korean rates; except in transportation, electronics/machinery, and manufacturing (for which China has much lower rates) (Cheong et al., 2003b, p. 88). Differences in tariff rates and trade barriers reflect different stages in economic development as well as differences in political clout of import-competing sectors. An omnibus trade negotiation would be quite complicated in resolving many competing claims.

2. STATISTICAL ANALYSIS

I employ a gravity equation to analyze the impact of FEAFTA on world trade[1] and for this purpose I will use the same dataset used in other chapters of this volume; see Chapters 2, 5, 6, 10, and Technical Appendix at the end of the volume. I select observations for 1975, 1980, 1985, 1990, 1995, and 1999 for all cross-country trade along with their GDP, exchange rate, and other geopolitical variables.

ASEAN presently has 10 member countries, including Indonesia, Malaysia, the Philippines, Thailand, and Singapore. ASEAN wants to establish a single integrated market by 2020. At the same time, in September of 2004, ASEAN summit meetings invited the state heads from China, Japan, and South Korea for an ASEAN + 3 Framework meeting. The ASEAN wants to link its members to those three large economies in Far Eastern Asia. In the future, we may indeed see an extended Asian trade block, which may even include India and Pakistan. There are numerous other preferential regional trade arrangements; see Chapter 3.

Estimates of the gravity model by ordinary least squares method are presented in Table 1. Larger countries trade more with significantly positive regression coefficients for (the log of) real GDP and for (the log of) real per capita GDP. Their coefficients are, respectively, 0.89 and 0.43, as shown in the second column of Table 1, in which all the regional trade areas (RTAs) are separately included in the regression equation. A 10% increase in the real GDP or real per capita GDP, respectively, will increase trade by 8.9% and 4.3%. Indeed (the log of) distance between trading partners is a great trade barrier, with a significant negative regression coefficient of -1.17. A 10% increase in the distance between the two trading partners will reduce their trade by 11.7%. Results in Table 1 are, as expected, similar to those reported in the literature; see also Chapter 2. For RTA dummies, coefficients vary from one RTA arrangement to another.

The coefficient of NAFTA is only 0.13 and is not statistically significant. In contrast, some coefficients of RTAs are large and statistically significant. For instance, the coefficient for ASEAN is 1.75 and very significant. Studies in the literature repeatedly report a negative, significant coefficient for the EU. In Table 1, it is -0.62, due possibly to the fact that the EU is one of the oldest and most extensive RTAs. Their effectiveness to reduce trade barriers might have been diminished over the years. In addition, the protection of, for instance, agricultural sectors through the common agricultural policies might have even enhanced trade barriers. More study is needed to identify and quantify the effectiveness of the EU.

Since FEAFTA is not yet in place, we do not have its RTA dummy variable in the model. Moreover, a statistical investigation through the gravity model does not provide the impact of those RTAs on other trading partners. Yet, it is reasonable to assume that FEAFTA is closer to ASEAN than to NAFTA, mainly due to the fact that China is closer to many ASEAN countries geographically as well as in its economic development. Hence, FEAFTA is expected to significantly increase trade among member countries. If the impact of FEAFTA is assumed to be half that of ASEAN so that a hypothetical regression coefficient is 0.875, trade between the member countries and the rest of the world will increase by 87.5% after the conclusion of a trade agreement. This projection may underestimate the actual trade expansion because the data end in 1999 and China, since then, has greatly increased its domestic product and foreign trade.

Table 1. Estimates from Gravity Model Dependent Variable is the Log of Real Trade Flows.

Variables	With RTA Effects	With Separate RTAs
Intercept	−29.28*** (0.214)	−30.0*** (0.218)
Log of real GDP	0.88*** (0.004)	0.89*** (0.004)
Log of real GDP per capita	0.42*** (0.007)	0.43*** (0.007)
Log of distance	−1.17*** (0.014)	−1.17*** (0.014)
Regional dummy	1.16*** (0.074)	
Interregional dummy	0.35*** (0.036)	0.30*** (0.036)
Common currency dummy	0.80*** (0.085)	0.92*** (0.085)
Common land border dummy	0.43*** (0.066)	0.48*** (0.067)
Common colonizer before 1945 dummy	0.62*** (0.038)	0.60*** (0.038)
Common country dummy	1.18* (0.662)	1.16* (0.659)
Colonial relationship dummy	1.58*** (0.077)	1.58*** (0.077)
Common language dummy	0.35*** (0.027)	0.32*** (0.027)
1975, 1980, 1985, 1990, 1995, and 1999 year dummies	Estimated but not reported here	Estimated but not reported here
ASEAN dummy		1.75*** (0.222)
ANDEAN dummy		0.72* (0.380)
CARICOM dummy		2.0*** (0.131)
CACM dummy		2.03*** (0.257)
European Community/EU dummy		−0.62*** (0.125)
MERCOSUR dummy		0.94 (0.600)
NAFTA dummy		0.13 (0.784)
SPARTECA dummy		3.10*** (0.208)
USIS dummy		1.35 (1.036)
PATCRA dummy		−0.67 (0.943)
ANZCERTA dummy		−0.92 (1.056)
Number of observations	43,746	43,746
R^2	0.64	0.64

Note: The dependent variable is the average of four-way flows between country i and j divided by the U.S. price deflator. Numbers in parentheses are standard errors. Estimates were obtained from the ordinary least squares method by using pooled data compiled by Rose (2003), http://www.has.berkeley.edu/~arose/. For data sources, see Technical Appendix at the end of the volume.

*Statistical significance at 10% level.

***Statistical significance at 1% level.

3. FEAFTA

This section draws liberally from two publications by Cheong et al. (2003a, 2003b). At the summit meeting of China, Japan, and Korea in the Philippines in November 1999, the three countries hinted at the possibility of an FTA among them. Summit meetings of the same three countries have become an annual event. In the November 2002 meeting in Cambodia, China suggested, and all three countries accepted, a joint investigation toward the feasibility of an FTA. In October 2003, the three countries issued a communiqué announcing a formal study on the creation of an FTA. Since then, the three countries have jointly investigated various aspects of FEAFTA, results of which are published regularly in each country. Separately, Japan and Korea have announced, in October of 2004, that they were set to "declare the launch of official talks to forge an FTA by 2005."

The main purpose of FEAFTA would be to promote trade among China, Japan, and Korea. FEAFTA would initially become a free trade area, like NAFTA, but eventually attain the status of a customs union, like the EU. Thus, in addition to trade promotion through the elimination of trade barriers, the three countries want to closely coordinate their economic policies and their industrial infrastructure. Their aspiration is toward a peaceful co-development of the economy and long-lasting prosperity in the region. Yet, aside from those long-term goals, a trade promotion is their immediate purpose of pursuing an FTA.

The attitude of the United States toward FEAFTA was generally negative at the outset. In the early days of the discussion of a possible FEAFTA in the late 1980s and early 1990s, the United States reacted by proposing a close economic tie through the WTO or Asian Pacific Economic Cooperation (APEC). Since then, the United States completed NAFTA in 1994 and has pushed for the American FTA (AFTA) for the entire American hemisphere. U.S. attitude toward FEAFTA now is softer than at the start. The three countries at least believe that the United States will not oppose FEAFTA, barring a big political shock, such as another massive global terrorism event or a further deterioration of the North Korean relationship.

The United States still is reluctant to see a close relationship between Japan and China. Both Japan and the United States, in 2004, renewed their peace treaty and the United States reiterated that China is a potential threat to both countries. Japan is also cautious about the increasing role China plays in world politics. It might not have been coincidental that the United States proposed in 2004 the U.S.–Japan and the U.S.–Korea FTAs in order to contain the economic and political ambitions of China. As Cheong et al. (2003a) also note, a U.S.–China FTA is not likely in the near future.

Japan has been active in trade deals. As reported in the *Wall Street Journal* on March 30, 2004, Japan "was seeking a back door to the lucrative U.S. market" through a free-trade pact with Mexico. In addition, Japan wants to establish FTAs with Thailand, the Philippines, and Malaysia. Japan apparently realizes that the Southeast Asian region is very important to the country, especially after the 1997 Asian financial crisis. Japan is very active in the region, both in trade and a source of foreign direct investments.

There are many factors that the three countries have to overcome for a successful agreement. One of the main problems is that Japan and Korea, particularly Japan, are not as open on the import side as they are on the export side. Japan has the second largest GDP in the world, yet it ranks fourth in total international trade. Likewise, much of Korean domestic consumption is produced within the country. Both countries will have to open up their borders to fully take advantage of imports.

Agriculture is the largest stumbling block for a successful negotiation of FEAFTA. If countries leave out such an important sector altogether, any such FTA will not be recognized by the WTO. That is, the WTO does not allow an FTA among countries if it does not cover all industries. It is possible to exclude some segments of the agricultural sector, but most of the sector must be included. In addition, Japan and Korea share similar industry structure as indicated by Cheong et al. (2003b). These are some reasons why the Korea–Japan FTA needs to be – and, in fact, may very well be – negotiated before any other FTA configurations in the region.

Korea and Japan have similar characteristics in the agricultural sector. Neither country has a comparative advantage in it. Actually, because of this and other similarities, a bilateral Japan–Korea FTA would not benefit the two countries greatly. According to Lee and Okamoto (2002), Japan would still maintain its self-sufficient structure. Japan and Korea would become more deeply interdependent. On the other hand, China has a comparative advantage in the agricultural sector in general, and vis-à-vis Japan and Korea in particular.

Both Japan and Korea must realize that they have to liberalize their agricultural sectors in order to enjoy an expansion of exports in other sectors. With or without FEAFTA, the pressure to open up their agricultural sectors will increase over time for both Japan and Korea. Hence, both countries would be better off to include the agricultural sector in the negotiation of FEAFTA with China to proactively reform that sector as early as possible.

Another difficulty in a China–Japan bilateral FTA stems from the ambition of both countries to be leaders in Asia. This would be a reason to avoid a bilateral FTA. Yet, with or without an FTA, the battle for hegemony remains. The region in general, and Korea in particular, would be better off if neither China nor Japan were dominant. FEAFTA could actually become a good institutional arrangement in making and maintaining a balance of power between China and Japan for a peaceful Far Eastern Asia. Hence, the role of Korea cannot be overemphasized for the success of FEAFTA.

Lately, South Korea has been very active in seeking regional FTAs with its trading partners. Korea has reached an FTA with Chile and has completed an FTA negotiation with Singapore. Since 1998, Korea has been negotiating with Japan on a bilateral FTA. Recently, both countries have renewed their commitments toward a successful agreement to arrive at the declaration just mentioned. Korea is also talking with other South East Asian countries and with China. There is a good possibility that China, Japan, and Korea will indeed initiate a formal negotiation toward the tripartite FEAFTA soon, with the greatest potential benefit for Korea.

In order to maintain its tremendous economic and export growth rates, China will be eager to continue good trade relationships with the rest of the world. Particularly, China heavily depends on the United States, Japan, and Korea for its exports and for its much-needed foreign investments. Because of the developing status of its economy and recent membership in the WTO, China has to open up its borders to accept greater amounts of foreign direct investment and imports and follow the international norm in foreign trade. China will be eager to join FTAs with other countries to allay concerns of trading partners. China will value very highly the success of a China–Korea bilateral FTA, various FTAs with ASEAN countries, and eventually a tripartite FEAFTA.

The fact that these countries have different cultures and have waged war with one another is not unique in FTA arrangements. France and Germany or Argentina and Brazil have equally, if not greater, troublesome historical relationships. Countries do want to trade more and be friendlier, and former enemies will be more, not less, qualified for that. Other countries in Asia are positioning themselves to make FTAs with their trading partners in the region. Soon, and perhaps very soon, there will be quite a few FTA configurations in the region.

In view of the fact that economic growth rates in that part of the world far exceed those elsewhere, FEAFTA would contribute to both world trade and world peace.

4. IMPACT OF FEAFTA

China, Japan, and Korea account for 20% of the world economy. With fast growing China and with recovering Japan, this share is bound to rise in the future. FEAFTA will thus naturally have a large impact on world trade and the world economy. Because of size, population, and tremendous economic growth, the importance of FEAFTA would grow relative to that of the EU and NAFTA. Japan is an advanced country that exports a great deal but does not depend greatly on foreign trade for domestic consumption (Lee & Okamoto, 2002). FEAFTA would induce liberalization in the Japanese domestic markets. Japan's recent IDEA (Initiative for Development in East Asia) in Thailand, Indonesia, and other countries has met steep opposition in these and neighboring countries. ASEAN has been constantly approaching China, Japan, and Korea for extending an FTA. ASEAN + 3 have been in the agenda for both ASEAN and APEC for some time. Both ASEAN and FEAFTA want freer trade among themselves. Once FEAFTA is in place, a merger of ASEAN with FEAFTA would be feasible. In fact, the three countries could quickly extend memberships to India or even to Russia. Without a successful FEAFTA, on the other hand, ASEAN + 3, or ASEAN + FEAFTA, would not be possible. Perhaps, we would have ASEAN + China, ASEAN + Korea, and ASEAN + Japan for some time.

Because of the competition between China and Japan for hegemony, an FTA between China and Japan would be the hardest to complete; an FTA between Japan and Korea or between China and Korea would be the easiest. Japan and Korea are going through the process of opening up their rice markets. At the end of the Uruguay Round, Korea negotiated with rice producing and rice exporting countries to open up its rice market by the end of 2004. Between 1994 and 2004, Korea opened its rice market such that the share of foreign imports rose from 1% to 4% of the market share in Korea. Korea still has to further increase the import of its rice reaching toward 8% of its market share by 2014. Both countries also import many agricultural products from other countries. Opening up its agricultural sector has been an issue for some time for Korea.

With or without a China–Korea FTA, Korea has to open up its agricultural sector. In addition, China is rapidly closing its technology gap with Korea in the manufacturing sector. Korea should realize that an FTA with China would greatly assist the country in maintaining the technology gap while enjoying increasing exports in the manufacturing sector. As for China, an FTA with Korea will enhance its economic and political position against Japan. As of 2004, both China and Japan view Korea as their closest and most desirable trade partner. Korea should take advantage of this unique situation to conclude successful FTAs with both Japan and China and, more importantly, toward FEAFTA. Otherwise, Korea will lose its leverage as time passes. If Korea does not take advantage of this situation in the near future, it will lose its leverage and a great chance for interdependent economic growth will be lost.

Once China and Korea start negotiating an FTA, in particular for the agricultural sector, then Japan may come to the table for two reasons. First, Japan would be better off politically by not letting China and Korea form an FTA. Second, because of the similar positions for Japan and Korea in their agricultural sector, especially against China, a successful FTA between China and Korea can easily transfer to a tripartite FEAFTA. Yet, a bilateral FTA between China and Japan may be the hardest of all to negotiate. It is reasonable to predict the following FTA negotiations among the three countries: first, Japan–Korea FTA, then China–Korea FTA, which are followed by FEAFTA among the three countries.

The impact of FEAFTA on world trade would be significant. According to Cheong et al. (2003b, p. 159), inter-FEAFTA trade is only 2.90% of the world trade, although the proportion of exports and imports of the three countries with the rest of the world is almost 27% of it. Even without FEAFTA, the former number will increase. With it, however, that number will become even larger, and if it reaches, for instance, 27%, it would indicate a tremendous amount of trade creation. As of 2001, according to Cheong et al. (2003a, p. 71), trade among FEAFTA countries is only about one-third of the trade among the EU countries or among the NAFTA countries. In sum, FEAFTA is more outward oriented in trade than either the EU or NAFTA.

In the meantime, additional FTAs with other countries in Latin America or European countries are likely to be negotiated, separately, by China, Japan, or Korea. The three countries will likely initiate their FTAs with the ASEAN. Consequently, in the late 2010s or in the early 2020s, we may have ASEAN + FEAFTA or even ASEAN + FEAFTA + India and other Asian countries under an Asian Free Trade Agreement (ASFTA).

By that time, AFTA for the entire North and South Americas would likely be concluded. At the same time, the EU would continue to expand its memberships to form an Extended EU, or EEU. The world will truly be divided into the triads of EEU, AFTA, and ASFTA. Some former Soviet Union countries may join EEU and some others may join ASFTA. It is unclear what may happen to Russia. Because of geographical proximity, Russia may end up joining ASFTA. Hopefully, trade barriers, not only among member countries but also against non-member countries, will become so low that by the time we have those three giant free trade groups, they may lose the meaning of regional trade agreements altogether. The entire world may then enjoy free trade.

Yet, while some countries strive to achieve those three giant FTAs, the competition across them will become more severe. Once ASFTA is formed, those Asian countries would have more say in world trade and politics. Unless the entire world truly becomes one without any trade barriers, new triads will simply replace the current triads that are not as well defined. Currently, we do have triads in world trades among the EU, the NAFTA, and Japan. We would thus extend the current system to the triad of EEU, AFTA, and ASFTA. It is very possible that the world will be further and more deeply divided, in terms of international trade, by deepening, not lessening, the regionalization of trade in those three regions. In fact, Rugman and Verbeke (2005) show that most large multinational corporations have about 80% of their sales in one of the three triads. Though each country becomes more liberalized and hence globalized in its exports and imports, overall international trade may also follow similar patterns with intensified regionalization based on the same triads.

5. CONCLUDING REMARKS

Advancement of various configurations of FTAs appears to be driven more by geopolitical than economic factors. China, Japan, and Korea are relative newcomers to FTAs. They have quickly negotiated a few FTAs, but thus far only with small trading partners. They have not had sufficient time to evaluate the impacts of those FTAs. All three countries appear to compete in enlarging their FTAs, especially with the ASEAN countries. Because of geographical proximity and the role of Hong Kong, China can move quickly with the ASEAN. Japan has already amassed tremendous foreign direct and portfolio investments in the region and is realizing the importance of the region following the events of the 1997 Asian crisis. Korea depends heavily on exports for its economic growth and is anxious to expand its trade with the ASEAN countries.

At the same time, the three countries have initiated trade talks toward the establishment of FEAFTA. Yet, China and Japan are not eager to form a bilateral FTA because of their sizes and their rivalry in global hegemony. It seems that Korea is in an ideal position to make FEAFTA happen. In addition, Korea would gain most from the formation of FEAFTA.

A bilateral China–Japan FTA is not likely, a bilateral Japan–Korea or a bilateral China–Korea FTA would not benefit Korea greatly. Japan is more advanced than Korea and Korea competes directly with Japan in many similar products and industries. A China–Korea FTA would critically depend on the handling of the agricultural sector. Since Japan and Korea are in similar situations concerning their agricultural sectors, many issues between China and Korea would overlap in negotiations between China and Japan. In sum, Korea has strong incentives for a tripartite FEAFTA.

The world will then have three large trading blocks: EEU, AFTA, and FEAFTA + ASEAN. As long as all three trading blocks lower their trade barriers, the world would enjoy greater international trade. Yet, it is also possible that new trading conflicts would be further amplified because of the enlarged blocks. The WTO's role should be enhanced in order to reduce trade conflicts among the giant trading blocks. Otherwise, world trade may see a deepened and enhanced regionalization. Although trade increases greatly within each trading block, trade and investment between those blocks may not increase as much as true globalization warrants.

NOTES

1. See, among others, Anderson (1979), Frankel (1997, Chapter 5), and Rose (2000, 2003).

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CHAPTER 9

ASIAN BUSINESS IS REGIONAL, NOT GLOBAL

Alan M. Rugman and Simon Collinson

ABSTRACT

Of the 75 Asian firms with data on regional sales, only three are global whereas 66 have the majority of their sales in their home region. Why is this? Despite a large literature extolling the global success of Asian firms, especially the Japanese, why does the evidence suggest that most Asian firms operate regionally? This study explains how most large Japanese firms have firm-specific advantages, which are based in their home region.

Recent empirical research has demonstrated that the vast majority of the world's 500 largest firms have most of their sales in their home region (Rugman & Verbeke, 2004). Of the 380 firms with regional sales data, the 185 from North America average 77.2% of their sales in their home region; the 119 from Europe average 62.8% and the 75 from Asia average 74.3% at home. While each region has three truly global firms, North America has 167 home-region oriented firms; Europe has 86 and Asia has 66 home-based firms, Rugman (2005). These data indicate a lack of globalization in the sense of a commonality of interests and the homogenization of markets as envisaged by Levitt (1983) and Yip (2002). Instead, we have a system of semi-globalization, (Ghemawat, 2001, 2003) in which firms and initiatives

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are strongly localized. This implies that analysis of global strategy has been too simplistic, if not indeed based on inaccurate interpretation of the data. For example the first example of a global business in Govindarajan and Gupta (2001) is Wal-Mart. Yet Wal-Mart has 94% of its sales in North America, and is better explained by regional issues (such as NAFTA) than global issues, Rugman (2005).

1. ASIAN BUSINESS IS REGIONAL, NOT GLOBAL

Of the 75 Asian firms with regional sales data in the world's top 500, 66 are Japanese. For this reason this paper focuses on the largest Japanese firms. The 66 Japanese firms in Table 1 average 74.7% of their sales in the Asian region. Of these 66 firms, only Sony and Canon are global. The third global firm in Asia is Flextronics of Singapore. Indeed, there are 66 home-region-based firms in Asia out of the 75. There are three bi-regionals: Toyota, Nissan and Bridgestone. There are two host-region oriented firms: Honda and News Corp. Overall, the 75 large Asian firms have an average of 74.3% of the sales in their home region. This is similar to firms from other regions of the triad, as reported in Rugman and Verbeke (2004).

The 75 Asian companies are listed in full in Table 2. Of the 75 firms as many as 66 are home-region oriented (shown in Table 2 as firms with a 'D' in the last column). This table shows that there is only one non-Japanese firm in the largest 25 Asian firms and that 20 of these 25 firms are classified as home-region based. Home-region firms include: Mitsubishi with

Table 1. The Country Distribution of Asia-Pacific MNEs and their Intra-Regional Sales.

Country	No. of Firms	Average Revenues (USD$bn)	Average Intra-Regional Sales (%)*
Australia	5	13.6	71.4
Japan	66	28.9	74.7
Singapore	1	13.1	22.4
South Korea	2	26.3	71.2
Taiwan	1	11.6	100.0
Asia-Pacific	75	27.4	74.3

Note: Numbers might not add up due to rounding. Data are for 2001.
*Weighted average is calculated by using the size of firms according to revenues.

Table 2. The 75 Large Asia-Pacific Firms.

	500 Rank	Company	Country	Revenues in U.S.$ (bn)	*F/T* Sales	Intra-Regional (%)	North America Percentage of Total	Europe Percentage of Total	Asia-Pacific Percentage of Total	C
1	10	Toyota Motor	Japan	120.8	50.8	49.2	36.6	7.7	49.2[j]	B
2	12	Mitsubishi	Japan	105.8	13.2	86.8	5.4[z]	1.7[u]	86.8[j]	D
3	13	Mitsui	Japan	101.2	34.0	78.9	7.4	11.1	78.9	D
4	17	Itochu	Japan	91.2	19.1	91.2	5.5	1.7	91.2	D
5	23	Sumitomo	Japan	77.1	12.7	87.3	4.8[z]	na	87.3[j]	D
6	25	Marubeni (q)	Japan	71.8	28.2	74.5	11.6[z]	na	74.5	D
7	32	Hitachi	Japan	63.9	31.0	80.0	11.0	7.0	80.0	D
8	37	Sony	Japan	60.6	67.2	32.8	29.8[z]	20.2	32.8[j]	G
9	41	Honda Motor	Japan	58.9	73.1	26.9	53.9	8.1	26.9[j]	S
10	45	Matsushita Electric Industrial	Japan	55.0	35.1	64.9	12.4[l]	6.9	64.9	D
11	58	Nissan Motor	Japan	49.6	50.3	49.7	34.6	11.0	49.7[j]	B
12	74	Nissho Iwai	Japan	43.7	21.4	88.9	7.5	3.0	88.9	D
13	77	Toshiba	Japan	43.1	37.0	75.3	13.9	8.7	75.3	D
14	80	Tokyo Electric Power	Japan	41.8	<10	>90	na	na	>90[j]	D
15	82	Mizuho Holdings	Japan	41.5	30.3	74.4	19.7	5.8	74.4	D
16	84	NEC	Japan	40.8	20.4	79.6	7.0	na	79.6[j]	D
17	88	Fujitsu	Japan	40.0	28.2	71.8	11.4[l]	12.2	71.8[j]	D
18	133	Hyundai Motor	South Korea	30.9	20.9	81.6	18.1	0.3	81.6	D
19	137	Sumitomo Mitsui Banking	Japan	30.2	22.4	83.4	11.1[l]	5.6	83.4	D
20	141	Mitsubishi Electric	Japan	29.2	26.3	83.1	8.9	6.0	83.1	D
21	161	Ito-Yokado	Japan	26.8	40.0	66.6	30.2	na	66.6	D
22	165	Mitsubishi Tokyo Financial Group	Japan	26.1	na	64.4	23.6	7.0	64.4	D
23	171	Mitsubishi Motors	Japan	25.6	40.9	62.8	22.1	12.1	62.8	D
24	174	UFJ Holdings (q)	Japan	25.3	29.4	78.5	15.5	6.1	78.5	D
25	190	Canon	Japan	23.9	71.5	28.5	33.8[l]	20.8	28.5[j]	G
26	197	Nippon Mitsubishi Oil	Japan	23.5	19.2	87.9	1.9	10.2	87.9	D
27	204	Mitsubishi Heavy Industries	Japan	22.9	7.9	93.2	4.7	1.9	93.2[j]	D

Table 2. *(Continued)*

	500 Rank	Company	Country	Revenues in U.S.$ (bn)	*F/T* Sales	Intra-Regional (%)	North America Percentage of Total	Europe Percentage of Total	Asia-Pacific Percentage of Total	C
28	208	KDDI	Japan	22.7	<10	>90	na	na	>90[j]	D
29	219	Hyundai	South Korea	21.7	46.2	56.3	24.2	10.5	56.3	D
30	229	Nippon Steel	Japan	20.6	17.8	82.2	na	na	82.2[j]	D
31	233	East Japan Railway	Japan	20.3	0	100.0	—	—	100.0[j]	D
32	237	Daiei	Japan	20.1	1.0	99.5	0.5	—	99.5	D
33	251	Fuji Photo Film	Japan	19.2	51.6	48.4	na	na	48.4[j]	I
34	252	Denso	Japan	19.2	32.4	73.1	20.0[l]	6.8	73.1	D
35	281	BHP Billiton	Australia	17.8	67.9	66.1	12.6	13.0	66.1	D
36	285	Bridgestone	Japan	17.6	61.2	38.8	43.0[l]	10.1	38.8[j]	B
37	293	Sanyo Electric	Japan	16.9	49.0	72.7	17.0	8.7	72.7	D
38	296	Mazda Motor	Japan	16.8	34.3	65.7	24.4	7.0	65.7[j]	D
39	302	Kajima	Japan	16.5	9.9	92.2	6.9	1.0	92.2	D
40	305	Nichimen	Japan	16.4	15.0	91.5	0.6[l]	2.3[m]	91.5	D
41	307	Japan Tobacco	Japan	16.3	9.5	90.5	na	5.8	90.5[j]	D
42	330	Mitsui Sumitomo Insurance	Japan	15.2	2.0	98.0	na	na	98.0[j]	D
43	346	Sharp	Japan	14.4	32.5	80.0	18.7[l]	9.5	80.0	D
44	348	Dentsu	Japan	14.3	5.0	95.0	na	na	95.0	D
45	350	Mitsubishi Chemical	Japan	14.2	13.1	86.9	na	na	86.9[j]	D
46	364	News Corp.	Australia	13.8	na	9.0	75.0[z]	16.0[u]	9.0	S
47	367	Nippon Express	Japan	13.7	14.9	85.1	na	na	85.1[j]	D
48	368	Japan Telecom	Japan	13.6	<10	>90	na	na	>90	D
49	371	Tohoku Electric Power	Japan	13.6	—	100.0	—	—	100.0	D
50	378	Taisei	Japan	13.4	<10	>90	na	na	>90	D
51	379	Ricoh	Japan	13.4	39.5	60.5	16.4[l]	16.1	60.5[j]	D
52	381	Suzuki Motor	Japan	13.3	31.6	68.4	13.3	14.9	68.4[j]	D
53	384	NKK	Japan	13.2	30.5	69.5	na	na	69.5[j]	D
54	388	Flextronics International	Singapore	13.1	na	22.4	46.3[z]	30.9	22.4	G
55	395	Norinchukin Bank	Japan	12.9	na	90.6	2.2	7.2	90.6	D
56	399	Japan Airlines	Japan	12.9	<10	>90	na	na	>90	D
57	404	Isuzu Motors	Japan	12.8	30.8	69.2	39.6	na	69.2[j]	D
58	405	Shimizu	Japan	12.7	5.5	94.5	na	na	94.5[j]	D
59	406	Coles Myer	Australia	12.6	0.5	100.0	na	na	100.0	D

60	411	Telstra (q)	Australia	12.4	na	92.6	na	na	92.6	D
61	431	Sumitomo Electric Industries	Japan	11.9	24.8	82.8	13.5[l]	na	82.8[j]	D
62	438	Kyushu Electric Power	Japan	11.7	—	100.0	—	—	100.0	D
63	440	Cathay Life	Taiwan	11.6	—	100.0	—	—	100.0	D
64	442	Woolworths	Australia	11.5	—	100.0	—	—	100.0	D
65	445	Yasuda Fire & Marine Insurance (q)	Japan	11.3	—	100.0	—	—	100.0	D
66	447	Obayashi	Japan	11.2	<10	>90	na	na	>90	D
67	462	Fuji Heavy Industries	Japan	10.9	34.0	66.0	33.7	na	66.0[j]	D
68	463	Daiwa Bank Holdings	Japan	10.9	<10	>90	na	na	>90[j]	D
69	466	Sumitomo Metal Industries	Japan	10.8	6.8	95.1	na	na	95.1	D
70	472	Sekisui House	Japan	10.6	<10	>90	na	na	>90[j]	D
71	474	Cosmo Oil	Japan	10.6	<10	>90	na	na	>90[j]	D
72	480	Dai Nippon Printing	Japan	10.5	10.5	89.5	na	na	89.5[j]	D
73	489	Toppan Printing	Japan	10.4	<10	>90	na	na	>90[j]	D
74	490	Showa Shell Sekiyu	Japan	10.4	12.8	90.8	na	na	90.8	D
75	499	Asahi Glass	Japan	10.1	40.7	74.5	12.1[l]	13.4	74.5	D

Note: Data are for 2001.

D = Home-Region Oriented; S = Host-Region Oriented; B = Bi-Regional; G = Global; I = Insufficient Information; na = not available.

Marubeni: Asia includes only Japan and Singapore; *UFJ:* Estimated using ordinary income figures from the Annual Report; *Telstra:* Data for Asia is only for Australia; *Yasuda Fire & Marine Insurance:* Now part of Sompo, the Annual Report describes overseas sales as immaterial and does not report them.

[u]refers only to the United Kingdom

[l]refers to Americas

[m]refers to EMEA: Europe, Middle East, and Africa

[z]refers only to the United States; and

[j]refers to Japan

86.8% of its sales in Asia; Mitsui with 78.9%; Itochu with 91.2%; Sumitomo with 87.3%; Marubini with 74.2%; Hitachi with 80.0%; Toshiba with 75.3%; NEC with 79.6%; Sanyo Electric with 75.7%; Mazda with 65.7%; Sharp with 80.0% and Asahi Glass with 74.5%. None of these firms can be thought of as global; they are all conducting the great majority of their business in the Asian region. This is the key empirical driver of this paper; most Asian firms are regional, not global. We now consider the implications of this for analysis of the strategies of these large firms. In doing so, we must first distinguish new approaches from much of the traditional literature, which has assumed that large Asian (in particular Japanese) firms are global and follow global strategies. As we shall see, this is not the case.

2. THE LIMITED SCOPE OF ASIAN FIRM-SPECIFIC ADVANTAGES

The current concern about the evolving global competitiveness of large Asian firms has strong similarities with the fear of Japanese economic superiority among U.S. and European CEOs and policymakers in the 1970s and 1980s. Unprecedented growth in Japan's GDP, exports and outward FDI (OECD, 1989) suggested for the first time that an alternative model of market capitalism underpinned new forms of competitive advantage that would out perform incumbent firms in the United States and Europe. High-profile articles and books on the Japanese threat (Franko, 1983; Wolf, 1983; Ouchi, 1981; Drucker, 1981; Vogel, 1979) fed this fear, and research efforts tried to identify what was different about Japan and its firms and how such differences might convey sustained competitive advantages.

As a sub-set of the literature connecting multinationality and performance (Rugman, 1979, 1981; Buckley & Casson, 1976; Hitt, Hoskisson, & Kim, 1997) studies of Japanese firms have attempted to connect differences in Japan itself, as the 'locus of origin of geographic diversification' (Wan & Hoskisson, 2003), with attributes in Japanese firms that convey advantages vis-à-vis U.S. and European counterparts (Westney, 1999, 2001; Nelson, 1996; Fruin, 1992; Whitley, 1990). This research has tended, however, to over-generalize on the basis of the export-led growth of a relatively small number of industry sectors, the international success of a relatively small number of firms and superior capabilities in a limited range of business processes. As a result, the accepted wisdom (until the Japanese domestic-market recession from the early 1990s) was that these unique competitive advantages would lead to the widespread dominance of Japanese firms over incumbent firms in their own home markets.

Trade data show that export success of Japanese firms was only ever limited to a small number of industry sectors (Fransman, 1995) and these same sectors were responsible for much of the outward FDI and foreign sales of Japanese firms (Pearce & Papanastassiou, 1996; Dunning & Cantwell, 1991). The data presented in this paper further show how this success, expressed in terms of the proportion of overseas sales of a wide range of Japanese (and other Asian) firms, has also been rather limited. Their size, as is the case for many U.S. firms, reflects success in their large regional home market rather than their global competitiveness. Table 3 reports the industry breakdown of the 75 large Asian firms with regional sales data. Of these, 66 are Japanese (see Table 1).

One reason for the widespread perception of the global nature of Japanese firms within academic circles comes from biases in the empirical analysis of Japanese firms. As Table 4 shows, large 'global' international Japanese firms dominate the research across all business and management disciplines. There is a strong correlation between the degree of internationalization and the number of academic articles in which a firm features. While none of the top 5 firms in this list (Table 4) are the unusual home-market oriented type of Asian multinationals, these unrepresentative firms account for over half of the total number of articles for the entire group of 75. There is an overwhelming bias toward firms like Toyota, Sony, Canon and Honda because they have made their mark in the global economy (particularly in the United States). Yet they are not representative of Japanese or Asian firms in general. We know least about the most 'typical' group of Asian firms whose sales are predominantly in their home region.

While acknowledging the differences in Japanese organizations identified by the above studies we argue that these have not led to superior competitive advantages for a wide range of Japanese firms in the global economy. Few Japanese firms have ever managed to leverage their unique characteristics to internationalize across the triad. The vast majority of Japanese firms are still strongly dependent on the domestic market. The last 10 years have therefore seen widespread decline in corporate performance as recession or near-recession has hit profits, in many cases for the first time in over 45 years. This change has revealed substantial weaknesses in the strategies and structures of such firms, contrasting with much of the accepted wisdom of the pre-recession studies.

Table 3. The 75 Asia-Pacific MNEs, by Industry and Category.

Industry Category	Global	Bi-Regional	Host-Region Oriented	Home-Region Oriented	Insufficient Information
Manufacturing	3	3	1	33	1
Aerospace and defense	0	0	0	0	0
Chemicals and pharmaceuticals	0	0	0	1	0
Computer, office and electronics	3	0	0	10	0
Construction, building materials and glass	0	0	0	6	0
Energy, petroleum and refining	0	0	0	3	0
Food, drug and tobacco	0	0	0	1	0
Motor vehicle and parts	0	3	1	7	0
Natural resource manufacturing	0	0	0	4	0
Other manufacturing	0	0	0	1	1
Services	0	0	1	33	0
Banks	0	0	0	6	0
Entertainment, printing and publishing	0	0	1	2	0
Merchandisers	0	0	0	12	0
Other financial services	0	0	0	3	0
Telecommunications and utilities	0	0	0	6	0
Transportation services	0	0	0	3	0
Other services	0	0	0	1	0
Total	3	3	2	66	1

Note: Data are for 2001.

To put much of the literature on Japanese firms into perspective, we will examine some selected case studies and compare global and bi-regional firms with home-region oriented firms from Japan. These cases will include reviews of major studies that have attempted to explain the sources of competitive strengths and weaknesses in these firms. This will show how the former set of firms above is relatively unique in managing to develop firm-specific advantages (FSAs) applicable to other triad markets. The Japanese-studies literature helps provide the beginnings of an explanation of why most firms are

Table 4. The 75 Asia-Pacific Firms Ranked by the Frequency with which they Feature in Academic Articles.

Article Hits*	500 Rank	Company	Country	Revenues in U.S.$ (bn)	Asia-Pacific Percentage of Total	C	Data for Selected Groups				
							Cumulative Hit Total	Cumulative Hit Total (%)	Average No. of Article Hits	Average Revenues	Average Asia-Pacific (%)
91	10	Toyota Motor	Japan	120.8	49.2	B					
51	37	Sony	Japan	60.6	32.8	G					
45	190	Canon	Japan	23.9	28.5	G					
40	41	Honda Motor	Japan	58.9	26.9	S					
36	58	Nissan Motor	Japan	49.6	49.7	B	263	51	52.6	62.8	37.4
26	12	Mitsubishi	Japan	105.8	86.8	D					
26	84	NEC	Japan	40.8	79.6	D					
20	77	Toshiba	Japan	43.1	75.3	D					
20	251	Fuji Photo Film	Japan	19.2	48.4	I	355	69	39.4	58.1	53.0
18	32	Hitachi	Japan	63.9	80	D					
16	45	Matsushita Electric Industrial	Japan	55	64.9	D					
13	88	Fujitsu	Japan	40	71.8	D					
9	13	Mitsui	Japan	101.2	78.9	D					
9	381	Suzuki Motor	Japan	13.3	68.4	D					
8	23	Sumitomo	Japan	77.1	87.3	D					
8	141	Mitsubishi Electric	Japan	29.2	83.1	D					
8	285	Bridgestone	Japan	17.6	38.8	B					
5	133	Hyundai Motor	South Korea	30.9	81.6	D					
5	219	Hyundai	South Korea	21.7	56.3	D					
5	379	Ricoh	Japan	13.4	60.5	D					
5	411	Telstra (q)	Australia	12.4	92.6	D					
5	442	Woolworths	Australia	11.5	100	D	469	91	8.8	37.5	74.2
4	296	Mazda Motor	Japan	16.8	65.7	D					
3	82	Mizuho Holdings	Japan	41.5	74.4	D					
3	171	Mitsubishi Motors	Japan	25.6	62.8	D					
3	252	Denso	Japan	19.2	73.1	D					
3	364	News Corp.	Australia	13.8	9	S					

Table 4. *(Continued)*

Article Hits*	500 Rank	Company	Country	Revenues in U.S.$ (bn)	Asia-Pacific Percentage of Total	C	Data for Selected Groups				
							Cumulative Hit Total	Cumulative Hit Total (%)	Average No. of Article Hits	Average Revenues	Average Asia-Pacific (%)
2	229	Nippon Steel	Japan	20.6	82.2	D					
2	293	Sanyo Electric	Japan	16.9	72.7	D					
2	348	Dentsu	Japan	14.3	95	D					
2	368	Japan Telecom	Japan	13.6	91	D					
2	378	Taisei	Japan	13.4	91	D					
2	388	Flextronics International	Singapore	13.1	22.4	G					
2	399	Japan Airlines	Japan	12.9	91	D					
2	404	Isuzu Motors	Japan	12.8	69.2	D					
2	445	Yasuda Fire & Marine Ins. (q)	Japan	11.3	100	D					
2	499	Asahi Glass	Japan	10.1	74.5	D	505	97	2.4	17.1	71.6
					For all 75 firms		518	100	0.9	19.7	83.2

Note: Quoting the database providers, ''Business Source Premier is described as 'the world's largest full text business database.' It provides full text for nearly 3,800 scholarly business journals, including full text for more than 1,100 peer-reviewed business publications. Coverage includes virtually all subject areas related to business. This database provides full text (PDF) for more than 350 of the top scholarly journals dating as far back as 1922. This database is updated on a daily basis via EBSCO*host.*'' By comparison, the Social Sciences Citation Index covers 1,725 journals spanning 50 disciplines.

Table 4 lists the firms ranked in order of the number of article 'hits' received. The final list includes a cumulative total of 518 hits across the top 75 firms. This does not mean 518 individual articles since the count includes multiple hits where single articles include more than one listed firm. Only the 37 firms, which returned 2 or more hits, accounting for 505 of the 518 total, are listed here. We should note that the database, although providing global coverage of business and management journals is dominated by English language, U.S.-based publications. This is, however, simply a reflection of the research field and the proportion of U.S. academics and academic institutions in the field.

*Article 'hits' refers to the number of search 'hits' that were returned from a keyword search combining the name of the firm and the term 'business.' Only peer-reviewed periodicals were included in the search, which used the 'Business Source Premier' database.

home-region-based in their FSAs. First we develop an analytical framework to position these case studies.

3. THE REGIONAL MATRIX

We adapt the basic model of the international business field, which distinguishes between country- and firm-level effects. In earlier work a matrix of country-specific advantages (CSAs) and firm-specific advantages (FSAs) was developed (Rugman, 1981; Rugman & Verbeke, 1992). Much of the analysis in the IB field can be synthesized within a simple framework of CSAs and FSAs, which are the two basic building blocks for international business strategy.

First, there is a set of firm-specific factors that determine the competitive advantage of an organization; we call these firm-specific advantages. An FSA is defined as a unique capability proprietary to the organization. It may be built upon product or process technology, marketing or distributional skills. The FSAs possessed by a firm are based ultimately on its internalization of an asset, such as production, knowledge, managerial, or marketing capabilities over which the firm has proprietary control. FSAs are thus related to the firm's ability to coordinate the use of the advantage in production, marketing, brands, or the customization of services.

Second, there are country factors. These, of course, are highly relevant to firms involved in international trade and investment. They can lead to country-specific advantages (CSAs), which affect a firm's strategy. For example, the CSAs can include political, cultural, economic, and financial factors, which are parameters exogenous to the firm. The CSAs can be based on home-country natural resource endowments (minerals, energy, forests) or on the labor force and cultural factors. The CSAs can also include demand conditions; the political, cultural, and regulatory systems; and infrastructure. In Porter (1990) terminology, the CSAs form the basis of the global platform from which the multinational firm derives a home-base 'diamond' advantage in global competition. Tariff and non-tariff barriers to trade and other government regulation also influence CSAs. Building on these CSAs, the firm's leading managers make decisions about the efficient global configuration and coordination between segments of its value chain (operations, marketing, R&D, and logistics). The skill in making such decisions represents a strong managerial, indeed organizational, FSA, which can be dynamic in a Penrose sense, Rugman and Verbeke (2002).

This two-by-two FSA/CSA matrix can be modified into a new matrix, as shown in Fig. 1. On the horizontal axis is shown the regional or global reach

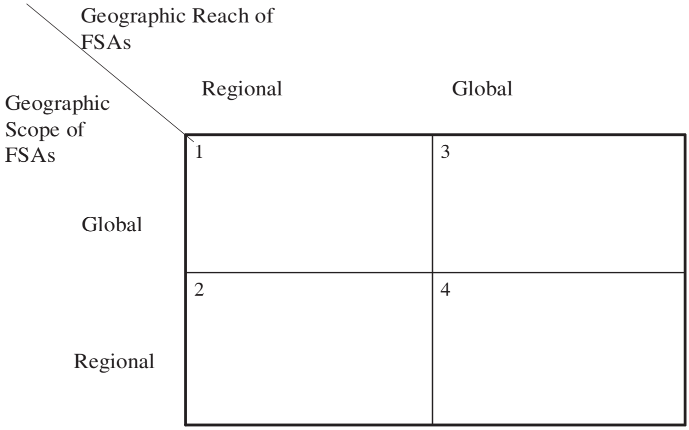

Fig. 1. The Regional Matrix.

of the FSAs of a firm. On the vertical axis is shown the regional or global scope of the locational advantages of a firm's FSAs. The regional matrix can be used for analysis of firm strategy in connection with the geographic reach of FSAs and the geographic scope of FSAs. It differs from the CSA/FSA matrix as now both axes represent FSA aspects of corporate strategy. On the horizontal axis the firm's FSAs are exploited either regionally or globally. On the vertical axis the firm's geographic scope of FSAs (either regional or global) determines the locus of competitive advantage for the firm. In turn, this latter axis depends upon the nature and impact on the firm of relevant CSAs, but the CSAs themselves are parameters to which managers react.

The regional matrix will allow us to position the 75 Asian firms for which data on intra-regional sales can be obtained. The vertical axis becomes operational for strategy, as, for each firm, there are data available on its geographic scope. Most of these 75 firms will be on the lower (regional) half of the vertical axis. Only three of the 75 firms are unambiguously 'global' in their geographic scope. The three bi-regional firms are also constrained in their geographic scope to the regional half of the vertical axis. We now turn to the analysis of these three types of firms, using this new regional matrix.

On both axes of the regional matrix, a distinction is made between regional and global dimensions. For example, on the vertical axis, at the regional level, the relevant indirect CSA affecting a firm's geographic scope of FSAs can be a national government regulation or an EU or NAFTA regulation; at the global level it is a WTO, IMF, or UN type of instrument.

Other locational effects of CSAs on a firm's FSAs can also be modeled to include culture, infrastructure, and resource endowments. On the horizontal axis the geographical reach of an FSA can be based, for example, on a national patent or a regional EU 'eco' label's green capability (Rugman & Verbeke, 1998). For a global reach to the FSAs it is necessary for the FSA to become a global standard or a global brand, and/or have global benefits of integration, with economies of scale and scope. This matrix does not handle 'national responsiveness' directly, but these location-bound FSAs have been discussed in Rugman and Verbeke (1992).

In this regional matrix, only cell 3 is purely global. There a firm can be both global in the reach of its FSAs and in the scope of its locational advantages. In contrast, cell 2 is purely regional. By regional it is meant home region. A firm can be purely regional when the reach of its FSAs is limited to its home country and/or home region, while the geographic scope of its FSAs is also limited to its home region.

In contrast, in cell 4, bi-regional firms appear. These have a global reach to their FSAs, but their geographic scope of FSAs is not fully global but is limited to two regions. The bi-regionals have more than 20% of their sales in two regions of the triad and less than 50% in any one region. They are more 'global' than the home-region firms in their reach of FSAs, and individual cases will need to be analyzed to find the specific reasons for their positioning in the regional matrix.

Finally, cell 1 is a case not observed often, where there is only a regional reach of FSAs, despite a potentially global scope for FSAs. Firms remain in cell 2, when the regional reach of their FSAs acts as a constraint to the development of their geographic scope.

This leads to the following key analytical classifications:

Cell 3: Global firms – these have a global reach of their FSAs and a global scope for FSAs; they are in all three regions of the triad; we find three among our 75 Asian firms in Table 2.

Cell 4: Bi-regional firms – these have a global reach for their FSAs, but they are not global in their geographic scope, as they only have a significant presence in two regions of the triad; again there are just three in our list of 75 Asian firms (Table 2); host-region firms such as News Corp and Honda also appear here.

Cell 2: Home-region firms – they have FSAs with a reach only in their home region, and they also have home-region locational FSAs; 66 of the 75 Asian firms in Table 2 fit into this category.

Cell 1: Firms with home-region FSAs but a global scope in FSAs – there are very few of these in practice, although many firms think that they are global in scope; data show, however, that they are actually home-region based, in cell 2. We call cell 1, the 'myth' of global scope.

In cell 1, firms cannot develop the complementary FSAs with a global reach that are required to exploit the global scope of their FSAs. While the environment of international business is becoming more global, it is very difficult for firms to transfer their successful regional FSAs into global FSAs. Often it requires developing new FSAs in 'national responsiveness.' Thus many of the potential cell 1 firms remain in cell 2, where their regional reach of FSAs is matched by a locational advantage in one specific region – usually their home region. The literature on globalization and global strategy has tended to ignore the complexities involved in this cell of the myth of global scope, and it has usually been assumed that global scope is all a firm needs to become global. But firms also need a global reach of their FSAs. This can only be achieved by a new alignment of strategy and structure, since a global reach of FSAs needs a different type of firm than one with a local or regional reach of FSAs. These complexities of global and regional strategy and structure are explored further in Rugman (2005).

4. JAPANESE CASE STUDIES

We now apply the framework of Fig. 1 to analyze some specific firms in each of the major cells. This will help us to classify the differences between regional and global strategies of the world's largest firms.

Our sample is comprised of three home-region oriented firms (Sumitomo Chemical, Nippon Steel, and NEC), two bi-regional firms (Toyota and Nissan Motor), one host-oriented (Honda), and one global (Canon). Our aim is to differentiate between the more unusual international firms, which have been the subject of much analysis already, and the more representative home-region oriented firms. Clearly there are industry sector effects that need to be considered in explaining the differences across the above sample of firms. Steel and bulk chemicals, simply because of transportation costs, are less internationalized industries. But this is another factor promoting regionalization rather than globalization.

This paper focuses on Japanese firms for a number of reasons, not least because they dominate the list of the largest Asian MNEs. There is also a more extensive literature on Japanese firms. One of our objectives here is to show that by focusing on anomalous cases of global and bi-regional firms this literature is misleading in its appraisal of the relative strengths and weaknesses of Japanese firms in general.

4.1. Sumitomo Chemical (Home-Region Oriented)

Although it is not listed individually in the top 75 Asian firms in Table 2, Sumitomo Chemical belongs to the Sumitomo Group – one of the 6 major corporate complexes still very dominant in Japan – with its origins in one of the pre-war *zaibatsu* business families (Shiba & Shimotani, 1997). It was founded in 1913, has its headquarters in both Tokyo and Osaka and is one of Japan's leading chemical manufacturers. Its main product divisions are Basic Chemicals, Petrochemicals and Plastics, Fine Chemicals, IT-Related Chemicals, and Agricultural Chemicals. In 2001–2002 it had just over 17,000 employees and net sales of U.S.$7,642 million.

As shown in Fig. 2, 28% of sales (exports plus sales from overseas operations) in 2002 were outside Japan, although this proportion has historically been below 20% (Sumitomo Chemical Annual Report, 2002). The major part of the increase from 18% in 1996 to 28% in 2002 was due to declining domestic sales, which fell throughout the 1990s. At the same time the firm has reduced its employee count by about 2000 between 1994 and 1999, a sure sign of trouble in a Japanese firm.

Also significant, the proportion of regional sales (to other Asian markets) has increased recently, from 54% of total foreign sales in 1999 to 57% for year-end March 2002. Just 16% of Sumitomo Chemical's overseas sales are in North America and 17% are in Europe. That is, the other two triad regions together account for less than 10% of total sales, similar to the other members of the Sumitomo group. Add to this the fact that its overseas assets

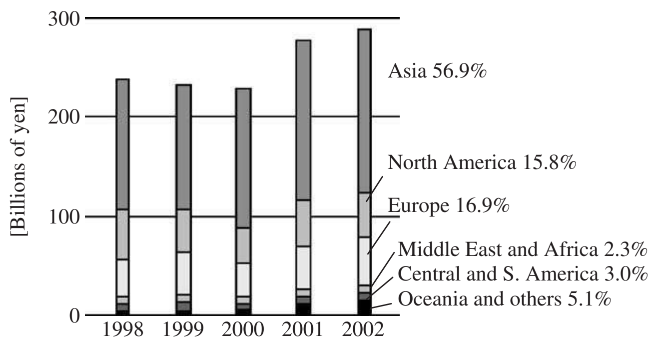

Fig. 2. Geographic Breakdown of Sumitomo Chemical's Overseas Operations (*Source:* Annual Report, 2002).

amounted to 12.6% of total assets in 2002 and the majority of its overseas operations are based in Asia (Fig. 2). Sumitomo Chemical is a home-region-oriented firm.

Research examined Sumitomo Chemical and Nippon Steel in the mid-1990s and again more recently to identify what organizational constraints these firms faced in adapting to the changing economic environment in Japan.[1] In attempting to counter the effects of the Japanese recession Sumitomo Chemical attempted to follow two core strategies through the 1990s: science-based diversification and internationalization. It was hoped that geographic diversification would break the firm's dependence on the declining domestic market and increase market share in other parts of the triad. These strategies failed to halt declining sales and falling net income and the sales data show it has become more of a regional player, failing to improve its competitive position in the rest of the triad.

The research identified a number of structural constraints in Sumitomo Chemical, which prevented the above strategic re-orientation and show how many of its FSAs have a limited geographic scope (cell 2 in Fig. 3). New product and process development expertise and organizational practices have evolved to meet the incremental innovation needs of current (Japanese) customers. Job-rotation and other strong cross-functional linkages underpin these capabilities while weakening its ability to engage in more radical science-led innovation or switch to new products or customers (Collinson, 2001a; Collinson & Wilson, 2003).

Geographic Scope of FSAs \ Geographic Reach of FSAs	Regional	Global
Global	1	3 *3 / 75 firms, averaging 32.7 articles 'hits' per firm.* Canon
Regional	2 *66 / 75 firms, averaging 3.4 article 'hits' per firm* Sumitomo Chemical, Nippon Steel, NEC	4 *5 / 75 firms, averaging 34.5 articles 'hits' per firm.* Toyota, Nissan Motor, Honda

Fig. 3. Asian Firms in the Regional Matrix.

Sumitomo Chemical, similar to other domestic-market-dependent Japanese firms, has developed an excellent system for co-learning with local *keiretsu* partners to meet its obligations toward local customers (Gerlach, 1992). However, these lock the firm into an internal architecture and external networks which limit its ability to switch the allocation resources or redirect management focus away from existing Japanese suppliers or clients.

Other factors, including the R&D function's reliance on Sumitomo Group finance, the context-specificity of fixed-assets (from test equipment to IT systems) and capabilities (from technological expertise to customer relationships) have evolved in tandem with complementary assets and capabilities in domestic supplier and buyer firms. All tie it into the home region, limiting the degree to which it can leverage its main competitive advantages elsewhere.

4.2. Nippon Steel (Home-Region Oriented)

Nippon Steel Corporation's steel-making operations date from 1901, with the present company being formed in 1970. It is organized into product divisions, including Flat Products, Bar and Wire Rod, Pipe and Tube, Stainless Steel and Structurals, and 5 Steel Manufacturing plants, in addition to a number of Engineering, Technical, and Sales departments. It had 17,370 employees in 2002 (down from 36,316 in 1993) and net sales of U.S.$19,373 million in 2001–2002. The firm is dependent on the domestic Japanese market for over 80% of its sales (Nippon Steel Corporation Annual Report, 2002). Over 90% of its assets are based in Japan. It is a home-region oriented firm.

Nippon Steel was also examined in the above-mentioned study of British and Japanese firms (Collinson, 1999; Collinson & Wilson, 2003). It adopted a similar strategy of market and geographical diversification in response to the deepening recession in the domestic market in the mid-1990s but failed to internationalize. The proportion of total overseas (including exports) to domestic sales has remained below 20% over the last few years, despite the overall decline in domestic sales in the 10 years to 2002. Nippon Steel Corporation has recently invested in steel-making facilities in China, partly to reduce manufacturing costs but also to follow car manufacturers to the fastest growing market for autos.

Similar to Sumitomo Chemical, Nippon Steel has evolved superior capabilities in processes and functions underpinning incremental, customer-led innovation. It has long been a benchmark in Japan for its continuous improvement in productivity, strip steel quality and manufacturability, and more efficient product development. Processes that support these capabilities include *jishu kanri* or self-managed teams and *benkyo-kai* or inter-firm learning groups (Yonekura, 1994; Nonaka & Yonekura, 1982).

Comparisons with British Steel (now Corus) as part of the above-mentioned research confirmed that these kinds of differences had significant performance implications but were very difficult to transfer between organizations or to other contexts (Collinson, 1999). Like other studies in this field (Yoshino, 1968; Tsurumi, 1976; Beechler & Bird, 1999; Liker, Fruin, & Adler, 1999; Westney, 2001, 1999) this research concluded that there are limits to the transferability of 'best-practices' because of their connection to the economic, social, and cultural environment in which they evolved. The transferability of organizational practices that (1) differentiate firms according to their home regions and (2) underpin different competitive strengths and weaknesses represents a key test of the geographic scope of FSAs.

In Nippon Steel's case long-term relationships with its local customers require dedicated R&D and the joint development of capabilities in materials technology, quality control, and steel processing equipment. This has been built on strong interpersonal links between R&D staff, engineers, and technicians at all levels. Seventy percent of external R&D cooperation at its Steel Research Laboratories is dedicated to the needs of existing customers. It also has permanent joint R&D organizations with 10 of its largest customers, including Toyota, to whom it supplied between 40% and 50% of its steel inputs in Japan at the time of this study. As confirmed by other research (Laage–Hellman, 1997; Nonaka & Yonekura, 1982) Nippon Steel has developed a more focused, in-depth range of local network connections with long-term suppliers and customers and other *keiretsu* members than counterparts in Europe or the U.S. This provides the benefits of *hierarchy*, but sacrifices the breadth and flexibility of *markets*.

Other, more quantitative and representative studies support the findings for Sumitomo Chemical and Nippon Steel, suggesting that poorer performing Japanese firms in the late 1990s not only tend be more dependent on the recession-hit domestic market but also tend to display more stereotypical Japanese organizational characteristics (Delios & Beamish, 2001, 2004; Jameson, Sullivan, & Constand, 2000). These characteristics link FSAs to the domestic political, economic, and social context, the CSAs of Japan. Additional evidence also comes from research that has identified components of organizational embeddedness which act as constraints on internationalization (Lam, 1997).

4.3. NEC (Home-Region Oriented)

In 1990 a leading article in Business Week titled: 'Why NEC has U.S. Companies "Shaking in Their Boots"' predicted that NEC would take over the dominant positions of IBM and AT&T in the U.S. The influential Harvard Business Review article by Prahalad and Hamel (1990) on the 'core competences of the corporation' in the same year began with NEC as a leading company to emulate. Because it was the only company in the top five in the three main areas of the information industry – computers, telecom equipment, and semiconductors – it was assumed to be a major competitive threat. In the early 1990s, however, NEC's foreign sales as a proportion of total sales were around 20%, the same as they are today. NEC evolved to meet the needs of the growing domestic market in Japan for these three product areas and has failed to expand to leverage its advantages beyond this home market.

NEC, ranked 84 in the *Fortune* Global 500, now produces computer products, networking, semiconductors, industrial systems, and home appliances. It is part of the Sumitomo group of companies, but is less integrated into this *keiretsu* than Sumitomo Chemical. Despite over 50 years of international expansion, Japan still accounts for about 83% of the company's revenues. North America accounts for an additional 5% while the remaining 12% are from sales in other parts of the world (2002). In terms of long-lived assets, 90% are in its home market of Japan. Clearly, NEC is a home-region based company (Table 5).

Why then, despite the above accolades, has NEC failed to leverage its clear technological advantages in the 1980s and 1990s and expand into overseas markets with its products? Fransman (1995) examines why NEC held such small shares in the U.S. or European markets for key technologies and

Table 5. Foreign Sales of NEC, 1998–2002 (in Millions of Yen).

Year	Revenues	Japan	Foreign	F/T Sales
1998	4,901,122	4,048,556	852,566	17.4
1999	4,759,412	3,662,123	1,097,289	23.1
2000	4,991,447	3,745,910	1,245,537	25.0
2001	5,409,736	4,308,152	1,101,584	20.4
2002	5,101,022	4,230,278	870,744	17.1
2003	4,695,035	3,879,454	815,581	17.4

Source: NEC, *Annual Report* 2002 and 2003.

components in the telecom industry (including just 0.1% of the U.S. market for digital switches in the late 1980s). A major reason is the firm's overwhelming focus on meeting the needs of its dominant customer in Japan, the previously nationalized telecom carrier NTT. Almost half of all NEC's sales at the end of the 1960s were to NTT. Although this declined to 20% by the early 1980s it has remained the firm's largest single customer, now still accounting for 16% of sales.

NEC led a group of preferred suppliers to NTT, which included Fujitsu, Hitachi, and Oki. Because of the size of NTT and the influence of the Ministry of Communications (later Posts and Telecommunications) this supplier *keiretsu* promoted the accumulation of what Fransman (1995) terms 'transaction-specific assets' among these firms, configured toward NTT's needs (similar to Northern Telecom and GTE in their relationship with AT&T in the U.S. telecoms market). Technical capabilities and specialized equipment, as well as a range of inter-firm relationships at all levels, developed in line with this dominant buyer's requirements and had little value in non-NTT transactions. These made it much more difficult for NEC to understand the needs of this potential foreign customer, reinforcing the regional 'lock-in.' Each of these 'flagship' firms supported the evolution of specialized regional clusters of supplier firms of the kind Porter (1990) refers to.

R&D funding and guidance from NTT and the Ministry of Communications were also important in driving regionally appropriate telecom platforms and related technological capabilities (Anchordoguy, 1989; Flamm, 1988; Fransman, 1993). In the late 1970s NEC had the same expertise in microprocessors as Intel. But it switched to a proprietary design (the V series), which was incompatible to Intel's (which became the de facto standard for PCs) and from then on the two platforms and their associated markets diverged. NEC was specifically focusing on developing chips for use in NEC's own PC, the PC-9800 series, which came to dominate the Japanese market (holding a 50% share in 1994).

Other factors have constrained NEC's ability to develop new FSA's with greater geographic scope. Consistent with the analysis of cross-shareholding by Nakatani (1984) and Lazonick and O'Sullivan (1996) its funding has normally come from the Sumitomo *keiretsu*, with an average of 25% of its shares in the past belonging to other group companies. It always had a very inward-looking Board of Directors, with outside representatives only from NTT and Sumitomo Bank and the other 37 directors being insiders from NEC (Kobayashi, 1991). Its management is not globally minded and has not created a globally diversified firm whose products and brand appeal to the other two regions of the triad. Compared to other firms in the industry, it is likely that NEC will continue to be home-region oriented, expanding its market and production to nearby countries in Asia.

4.4. Toyota (Bi-Regional)

Toyota tops the list of the largest Asia-Pacific firms (Table 2). In 2002, two regional markets accounted for well over 80% of its revenues: Asia (with Japan at 45% of revenues) and North America, at 38.8% of revenues (Table 6). Europe accounted for only 8.8% of revenues. In terms of units sold, the geographic distribution is similar: Asia and Oceania account for 46.2% of unit sales (Japan at 38%); North America for 30.8%; and Europe for 15%. Thus, in terms of revenue and units sold, Toyota is a bi-regional company. Market share shows a slightly different picture. Toyota holds approximately 40% of the Japanese market but only 10% of the North American market. Moreover, production is not as dispersed around the world; 75.9% of all Toyota cars are still produced in Japan and this is a significant decrease from 10 years ago. Only 14.9% are produced in North America. Other regions account for less than 10% of production.

As shown in Table 7, Toyota's foreign sales were just over 50% of total sales. But this is a relatively new level of internationalization since at the beginning of the 1990s this stood at 36%, reaching 43% by 1993. Over the last 10 years, Toyota's intra-regional percentage of sales has decreased from

Table 6. Toyota's Regional Breakdown in 2002.

Country	Sales Units	Sales Units (%)	Sales $ (%)	Assets (%)	Production (000) Units	Production (%)
Japan	2,217	38.3	45.0	52.8	4,029	75.9
Asia-Pacific	2,675	46.2	NA	NA	NA	NA
North America	1,780	30.8	38.8	35.8	793	14.9
Europe	866	15.0	8.8	6.7	258	4.9
Other	463	8.0	7.4	4.7	225	4.2
Total	5,785	100.0	100.0	100.0	5,306	100.0

Note: Production (%) is calculated using units; Sales units show the percentage of units sold in each region; Sales $ show the percentage of revenues generated in each region; Asia-Pacific includes Japan.

Source: Toyota, *Annual Report*, 2002.

Table 7. Toyota Vehicle Sales, 1993–2002.

Year	Total	Japan	Asia-Pacific	North America	Europe	Other
Units sold						
1993	4,466,218	2,159,474	2,548,736	1,134,006	442,291	341,185
1994	4,130,846	2,010,130	2,372,598	1,105,447	384,249	268,552
1995	3,260,670	1,560,970	1,857,920	911,578	288,065	203,107
1996	4,148,641	2,058,457	2,422,167	1,117,248	360,003	249,223
1997	4,559,515	2,216,072	2,659,759	1,201,309	415,580	282,867
1998	4,456,344	1,907,059	2,300,369	1,293,121	500,668	362,186
1999	4,695,147	1,929,279	2,244,982	1,485,095	557,506	407,564
2000	5,182,774	2,177,524	2,517,465	1,689,483	633,879	341,947
2001	5,526,863	2,322,838	2,726,131	1,733,569	691,135	376,028
2002	5,784,917	2,217,002	2,675,493	1,780,133	866,351	462,940
Percentage of units sold						
1993	100.0	48.4	57.1	25.4	9.9	7.6
1994	100.0	48.7	57.4	26.8	9.3	6.5
1995	100.0	47.9	57.0	28.0	8.8	6.2
1996	100.0	49.6	58.4	26.9	8.7	6.0
1997	100.0	48.6	58.3	26.3	9.1	6.2
1998	100.0	42.8	51.6	29.0	11.2	8.1
1999	100.0	41.1	47.8	31.6	11.9	8.7
2000	100.0	42.0	48.6	32.6	12.2	6.6
2001	100.0	42.0	49.3	31.4	12.5	6.8
2002	100.0	38.3	46.2	30.8	15.0	8.0

Note: 1995 is calculated using 9 months instead of 12.
Source: Adapted from Toyota, *Annual Report*, 2002.

57.1% to 46.2%. One major reason for this is the Japanese market itself, where sales decreased from 48.4% of total revenues in 1993 to 38.3% in 2002. In contrast, North American, European, and non-triad sales have steadily increased in importance. In 1993, Toyota derived 25.4% of its sales from North America. This rose to 30.8% in 2002.

North America is Toyota's second largest regional market in terms of revenues. It is also highly profitable. In 2002, a quarter of Toyota's profits originated in this region. Toyota manufactures locally over two-thirds of the cars it sells in the United States, plus it has a Canadian plant serving this regional market, and a Mexican plant in Tijuana.

Toyota's competitive positioning in the North American market comes from its success in leveraging two particular sets of FSAs in the region: (1) customer-led new product development, marketing, and brand-building; and (2) manufacturing productivity and quality. Local responsiveness is important for the first. Toyota introduced its luxury models to accommodate the aging and wealthier North Americans in the 1990s and has more recently targeted the young American customer. But (1) and (2) are directly related, given that Toyota's key selling point is high quality and low price. During economic downturns in which consumers seek more value for their money, Toyota does better than rivals in the U.S. Its cars are cheaper to run and have a higher resale value. Despite the lower price of its cars, it makes an average profit of $1,000 on each car sold compared to $330 for GM.

Toyota's manufacturing efficiency and excellence in process and product innovation has been the subject of numerous studies, as shown by its top-ranking (see Table 4). Much of the research from early analyses during the peak years of Japanese growth tended to focus on national network and organizational level characteristics that underpinned superiority in manufacturing quality and productivity (such as TQM, quality circles, just-in-time, kaizen) and new product development (Aoki, 1994). These are the two main pillars of innovation and the key differentiators of Japanese organizations in a wide range of studies.

Some of the most rigorous comparative research (Clark & Fujimoto, 1991; Womack, Jones, & Roos, 1990; Cusamano, 1985) was widely taken to be proof not just of the relative competitive advantages of Japanese auto firms but also of the strength of the competitive threat for home-market incumbents in Europe and the U.S. A closer look shows how these authors all stress the regional-level factors that contribute to the Japanese success in both manufacturing and new product development (Hill,1995; Clark, 1989; Clark, Chew, & Fugimoto, 1987). Faster lead times and reduced engineering hours which resulted in higher levels of productivity in Japanese new product development relied on close supplier relationships which only existed in Japan (Clark & Fujimoto, 1991)

Dyer (Dyer & Hatch, 2004; Dyer, 1996a, 1996b) in particular has examined Toyota both in Japan and in U.S.-based transplants. He shows how co-specialization and asset specificity in *keiretsu* alliances are sources of Toyota's competitive advantage vis-à-vis U.S. and European competitors. A tightly integrated production network, including close buyer–supplier relationships and requiring geographic proximity leads to lower inventory costs, faster product-development cycles, better quality, and more reliable products. Toyota, more than any other Japanese car firm has managed to replicate some of these conditions outside Japan. However, as the above data show, most of its manufacturing activities remain in Japan because of the way these attributes are locally 'embedded,' limiting the geographic scope of its FSAs.

Despite Toyota's success in the U.S. market this research supports the proposition that the national context in which these firms evolved held many of the keys to their performance. In retrospect we know there were limits to the international expansion of Japanese car firms, partly because U.S. and European firms responded to the competitive threat but mainly because many of their FSAs were limited to their home market. Toyota and Honda managed to transfer some elements of their advantage to succeed in U.S. and European markets; most other firms did not.

4.5. Nissan Motor (Bi-Regional)

Nissan is also one of the unusual bi-regional auto firms, with strong sales in the United States and a relatively good market position in countries outside the triad regions. This is a fairly recent development, however, and before 1996 it was a home-region oriented firm. Its reliance on the domestic Japanese market fell from 62.8% in 1996 to 52.2% in 2000. It is important to note, however, that this period was marked by a drastic decline in unit sales in Japan, from 1,131,000 units in 1996 to 733,000 in 2000. Unit sales overseas also fell during this period, but relatively less than in Japan where the firm fared worse than its competitors as consumer demand fell through the mid-1990s. Its bi-regional status is currently more because of its failure to compete effectively in its tough home market than any superior advantages abroad. Declining sales in all markets contributed to 6 years of losses and mounting debt in the 7 years prior to the Renault–Nissan alliance in 1999. Its $19 billion debt at the time of the alliance (according to Ghosn himself; Kelts, 2003 – JapanInc), 53% factory utilization, and the above-mentioned decline in sales all illustrate corporate failure.

The merger with Renault turned Nissan around. It began in March 1999 with Renault taking a 36.8% stake in Nissan; this is now increased to 44.4% with Nissan having a reciprocal 15% stake in Renault. Far-reaching changes have been put in place by Carlos Ghosn, installed as President and CEO of Nissan and now revered for having engineered this turnaround. The two firms together account for 9.1% of global auto sales, placing them jointly among the top 5 companies.

The two firms are complementary in terms of the geographic distribution of their production activities. Renault manufactures in 17 countries but makes over 55% of its vehicles in France and most of the rest in Europe. Nissan manufactures just over half of its vehicles in Japan with most of the rest spread fairly evenly between the U.S., Mexico, and the UK. It is one of the 8 passenger-car companies that have manufacturing operations in the north central *maquiladoras* region of Mexico, alongside GM, Ford, Chrysler, and VW. Because Nissan had established these plants prior to the finalization of NAFTA they are considered to be within the agreement, with the right to privileged access to the export markets of the United States and Canada.

Similar to the Sumitomo Chemical and Nippon Steel cases above, Nissan's failed performance prior to the Renault 'take-over' was largely due to its reliance on FSAs, which could only be leveraged in the local Japanese market prior to the recession. These assets and capabilities were sufficient during a time of domestic market growth, but represented sources of weakness and failure in the face of the radical changes that hit Japan during the 1990s.

Prior to the restructuring, Nissan was a 'very Japanese' company in a number of respects. Its rising debt had been accepted by institutional and *keiretsu* shareholders but had to be drastically cut by Renault's management. Cost-cutting, including plant-closures and layoffs (21,000 worldwide) and substantial changes to human resource management practices went completely against the lifetime employment principle, age-related hierarchy, and age-related (as opposed to performance-related) pay–all backed by the social employer–employee contract-strong unions and strong labor laws (Clegg & Konno, 1998; Sako, 1997). Long-term *keiretsu* relationships were cut, leading to an initial 10% reduction in dealerships and a halving of the number of suppliers.

The organizational inertia broken by Renault's restructuring had been supported by an inward-looking management perspective symbolized by the composition of the firm's original board of directors. Similar to NEC's board described above, it was comprised of 37 Nissan insiders (each having spent at least 27 years with the firm) out of a total of 40 board members. The three 'outsiders' came from the Fuji Bank, the Industrial Bank of Japan (IBJ), and the Japan Development Bank (JDB).

4.6. Honda (Host-Region Oriented)

In 2002 the Honda Accord was the best-selling passenger car in the United States and Honda generated over half its revenues (55.6%) in North America. Most of the company's long-lived assets are also in its host region of North America (53%). Its home market of Japan accounts for only 23.3% of sales. European sales account for 11.2% of sales while sales to non-triad regions account for the remaining 9.9% (Table 8).

Again, however, this high level of overseas sales is a relatively recent development, even in Honda. In the early 1990s, before significant declines

Table 8. Regional Sales and Assets of Honda.

Country	Sales $ (%)	Assets (%)
Japan	23.3	31.4
North America	55.6	53.0
Europe	11.2	7.4
Other	9.9	8.2
Total	100.0	100.0

Note: Data are for 2002.
Source: Adapted from Honda, *Annual Report*, 2003.

in the Japanese auto market, its overall foreign-to-total sales ratio was 62%.

This unusual dependence on the North American market is also the result of Toyota's dominance of the Japanese market. The relative spread of revenues across the triad is not only influenced by the ability of a company to penetrate a foreign market, but also by how much of the domestic market it can attain. A small car manufacturer might have better opportunities for growth, despite the liability of foreignness, in another region of the triad than in its own home region. As a smaller player in a very competitive domestic market Honda was forced to give foreign markets a higher priority at an earlier stage than most rivals (Fransman, 1995). One of its key FSAs, the ability to develop and manufacture small, fuel-efficient vehicles, evolved in Japan for the domestic market and arguably could only be leveraged effectively in the North American market when fuel prices increased (particularly during the early 1970s oil crisis).

To develop its local responsiveness, the company has R&D facilities in each of the triad markets. To increase value, the company relies on continued innovation and modular production methods driven by local trial-and-error learning and adaptation Pascale (1984). Another major attribute of Honda (and Canon) according to Nonaka (1990) lies in the maintenance of a degree of 'slack' to allow flexibility in both the allocation of human resources and information exchange for new product initiatives to be created and developed. Nonaka (1990) sees this necessary resource 'redundancy' as a critical factor differentiating Japanese firms and the less flexible, less efficient and slower new product development practices in non-Japanese firms.[2] These and other organizational capabilities which underpin Honda's superiority in new product development are strong FSAs and may well be among the characteristics that set Honda and Canon apart from both their western and Japanese competitors, accounting for their unusual level of success in the U.S. market.

4.7. Canon Group (Global)

Few companies can claim to be truly global multinationals, but with sales, revenues, production, and employees distributed across the world, the Canon Group of Japan, ranked 190 in the *Fortune* Global 500, comes as close as any to fitting that title. In 2002, 71.5% of Canon's revenues originated outside of Japan. The Americas accounted for 33.8% of total revenues, Asia accounted for 28.5%, and Western Europe for 20.8%. The remaining 16.9% of revenues were generated in other areas, including Eastern Europe.

Canon develops, manufactures, and markets cameras, business machines, and optical products. In 2001, the company had revenues totaling $23.9 million with 93,620 employees.

Canon's international expansion started in 1955 with the opening of a New York branch. Initially, the company relied on sole distributors and established some in Europe and Latin America in the late 1950s and early 1960s. The sole distributor system was abolished in 1963 to make way for company-owned subsidiaries under the direct control of the Japanese headquarters.

International expansion goes beyond marketing to include production, research, and development. Taiwan became the site of Canon's first foreign-production facility in 1970. Two years later the company opened a manufacturing plant in Germany. By 2001, the company had production facilities in all parts of the triad – Western Europe, the Asia Pacific region, and North America. Nevertheless, the vast majority of Canon's production facilities remain in Asia, including Japan.

In 1990, R&D centers were opened in the U.S., Australia, France, Thailand, and the People's Republic of China. Each R&D facility specializes in a specific product line and is coordinated by a centralized R&D lab in Japan. Approximately 8% of Canon's revenues are spent on R&D and it is the largest holder of patents after IBM (Bowonder & Miyake, 1997). Partly supporting the above-mentioned research of Nonaka (1990), other studies suggest that one of Canon's key competences is its global system for new product development. In particular, it has evolved a number of organizational mechanisms for linking R&D and customer requirements globally. This is partly done through alliances and joint ventures in which Canon invests over the long-term to derive the benefits of co-learning and joint resource development. Canon contributes its technological capabilities and supplier links, and local partners bring expertise relating to local customer preferences, distribution, and marketing (Perks, 2004, shows this in the case of Canon and Olivetti in Italy). There are parallels with Nohria and Ghoshal's (1997) idealized form of the global firm as a 'differentiated network' for distributed innovation.

Canon is organized regionally. Canon USA oversees operations in the Americas. The subsidiary employs 10,908 people and has its own marketing, R&D, and production facilities. Two companies oversee European operations. Together, Canon's European operations direct 12,875 employees, two manufacturing plants in Germany and France, and R&D centers in the UK and France. Canon's operations in Asia and Oceania, excluding Japan, account for the largest number of employees in foreign countries. Region-wide activities for the Asian market are overseen by the Canon Asia Marketing Group, but marketing operations in this region are sub-fragmented into sub-regional or national markets. The Southeast Asia region is the responsibility of Canon Singapore. Hong Kong has its own subsidiary that is also responsible for Taiwan and part of South Korea. The mainland Chinese market is the responsibility of Canon (China) Co. Japan's home market is still very important. Nearly half of Canon's employees are still working in Japan and company-wide R&D is still centralized there.

Over the last few years, Canon has been reorganizing its production facilities to take advantage of its global scope, selecting suppliers and production facilities across the world to minimize costs and decrease production time. As a result, product design data can now be sent to plants around the world via computer. Information is translated through an automatic translation system allowing faster communication between subsidiaries.

5. CONCLUSION

Fig. 3 summarizes our main findings. It reports the key data from Table 2 showing how the top 75 Asian firms are distributed across the regional matrix. We find that 66 out of the 75 firms are home-region oriented and lie in cell 2. Fig. 3 also lists the article 'hits' from Table 4, representing the degree to which academic research has focused on each group of firms. This clearly illustrates the overwhelming focus in the previous literature on the unusual global and bi-regional Japanese firms, which have been assumed to be representative of Japanese companies in general but are actually a few isolated special cases. Finally, the case-study firms discussed in this paper are placed in their appropriate categories.

The FSAs possessed by a firm are ultimately based on its internalization of an asset or capability. This determines its ability to leverage advantages away from its home region and compete successfully in other markets. What we demonstrate here, in the case of the Japanese firms examined, is that their major assets and capabilities have evolved in the specific selection environment of Japan. This means large Japanese firms are (1) innately tied to the regional and country-specific factors, the political, economic, social context and business infrastructures of Japan, and (2) they have evolved to compete in this environment. It may be more by chance than design that a particular capability provides a competitive advantage in another region of the triad. Honda's excellence in developing small cars was developed because it suited its immediate selection environment, the Japanese market. Honda's early success in the United States can be traced to rises in oil prices which U.S. manufacturers took time to adapt to.

It is highly unusual to find Asian firms like Toyota, Honda, and Sony that have managed to (1) decouple from the home country (or home region) base of their FSAs or to transfer some elements of them (organizational practices, *keiretsu* structures, etc.) to other markets of the triad, and (2) adapt and customize to compete outside their home region. Yet such unrepresentative 'global' firms are the overwhelming focus of traditional research into the alleged differentiating characteristics and superior competitive advantages of Japanese firms. The more insightful data of Rugman and Verbeke (2004) demonstrate that the vast majority of Asian firms have evolved to suit the regional Asian home market, remain dependent on this regional market, and are unlikely to break away from this legacy to substantially expand their sales into other regions of the triad.

NOTES

1. Although it examined the development and management of knowledge for innovation projects the study referred to here drew on organizational behavior research on 'national administrative heritages' (Calori, 1999) and neo-contingency approaches to national business systems (see Whitley, 1990; Maurice, Sorge, & Warner, 1980; Sorge, 1991). The Sumitomo Chemical and Nippon Steel case studies were compiled through 22 interviews in Japan over a 12 month period as part of a wider, comparative study of Japanese and UK organisations, the results from which are reported elsewhere (Collinson, 1999, 2001a, 2001b).

2. In keeping with our above observations of the sample selection of Japanese research his study focuses on individual case examples from the Japanese consumer electronics and automotive sectors, which our data suggest are anomalous. No direct empirical comparison with European or U.S. firms supports Nonaka's findings. In a later study (Kusunoki & Nonaka, 1998) using a much larger dataset (656 firms from the Japan Company Handbook) the authors acknowledge that they have made no direct international comparisons, but still put forward a range of conclusions

regarding Japanese firms' general superiority 'in creating process capabilities which underlie their competitiveness in product development.' The evidence we put forward suggests that these characteristics are either specific to a particular range of companies or industries, or they do not convey the same advantages (or outweigh other disadvantages) across many Japanese firms.

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PART C:
INTEGRATION AND TERRORISM

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CHAPTER 10

INTERNATIONAL TERRORISM, INTERNATIONAL TRADE, AND BORDERS

Michele Fratianni and Heejoon Kang

ABSTRACT

This paper shows that terrorism reduces bilateral trade flows, in real terms, by raising trading costs and hardening borders. Countries sharing a common land border and suffering from terrorism trade much less than neighboring or distant countries that are free of terrorism. The impact of terrorism on bilateral trade declines as distance between trading partners increases. This result suggests that terrorism redirects some trade from close to more distant countries. Our findings are robust in the presence of a variety of other calamities, such as natural disasters or financial crises.

The *Oxford English Dictionary* defines terrorism as furthering one's views through acts of coercive intimidation. It is self evident that terrorists want to disrupt the economic and political process of a nation. Acts of terrorism are costly in that they require governments to incur immediately rescue, cleanup, and reconstruction expenditures. In the longer term, terrorism raises anxiety and uncertainty in the community; this, in turn, adds to the cost and prices of goods and services, e.g. the terrorist premium on crude oil

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prices and reduces the propensity to invest in projects. Finally, terrorism prompts governments to setup costly policies of counterterrorism.

There is some evidence that political instability depresses economic activities: for example, Alesina, Ozler, Roubini, and Swagel (1996) find that economic growth slows down when government collapses and Barro (1991) uncovers a negative correlation between economic growth and political instability. As to the impact of terrorism on economic growth, the evidence appears more tenuous than the effect of political instability. To be sure, terrorism has had material economic consequences on specific areas of the world like the Basque Country (Abadie & Gardeazabal, 2003) and Israel (Eckstein & Tsiddon, 2004) and on specific industries like tourism (Enders, Sandler, & Parise, 1992), but these findings cannot be extended with equal force to panel studies involving a large sample of countries. Bloomberg, Hess, and Orphanides (2004), using data from 1968 to 2000 and 177 countries, detect a negative effect of terrorism on economic growth but find it to be economically less important than effects generated by either internal or external conflicts. To similar conclusions arrives Tavares (2004), who finds that the adverse impact of terrorist attacks washes away when additional control variables are taken into consideration. In contrast, natural disasters, banking, and currency crises leave a persistent mark on growth.

There is a sizable literature in political science on the relationship between conflict and international trade; see Reuveny (1999–2000) for a review. In some studies – such as those by Pollins (1989a, b) and Bergeijk (1994) – conflict is an exogenous force that raises the cost of doing business and lowers the amount of trade flows. In other studies, such as Polachek's (1980), conflict is instead endogenous so that a nation chooses an optimal level of conflict in international political environments. As trade becomes more intense, the economic cost of conflict rises and the equilibrium level of conflict falls. Reuveny and Kang (1998) tackle the direction of causality between international trade and conflict and find a mixed pattern: conflict Granger causes trade in metals, petroleum, basic manufactured goods, and high technologies, but trade Granger causes conflict in food, beverages, and miscellaneous manufactured goods.

The interaction between international terrorism and international trade has received little attention in the literature so far. In Nitsch and Schumacher (2004), terrorism is exogenous and produces a downward shift in the intercept of a gravity equation applied to bilateral trade flows. The headline result in that paper is that a doubling in the number of terrorist incidents in a year decreases bilateral trade by about 4% in the same year. Li and Schaub (2004), on the other hand, ask the question whether terrorism responds to a rise in globalization and conclude that terrorist activity declines inasmuch as globalization promotes economic development.

This paper starts with the premise that international terrorism is, to a first approximation, exogenous to bilateral trade flows and investigates how changes in terrorism activity influences trade primarily through changes in trading costs. Our focus on trading costs and borders is one of strategy, without disputing that terrorism may have secondary effects taking place through changes in real income and/or cultural variables that typically enter the gravity equation.

The structure of the paper is as follows. We start with a discussion in Section 1 on how terrorism impacts trading costs and the thickness of borders. We then propose an empirical specification of such effects based on a gravity equation of bilateral trade flows in Section 2, and find statistically significant and economically important terrorism-induced increases in trading costs and hardening of the borders. The strength of our findings suggests policy implications as discussed in Section 3 on how best to handle border safety with a minimum impact on trade flows. Conclusions are drawn in Section 4.

1. TERRORISM, TRADING COSTS, AND BORDERS

A recent report of the *Economist* (August 20, 2005) reminds us that terrorism is not a new phenomenon. "Bombs, beards, and fizzing fuses" are just as much the hallmark of today's Islamic inspired terrorism as of the revolutionary anarchism that swept Europe and the United States from 1870 to the start of World War I.[1] In addition to numerous ordinary people, victims of the earlier movement included the President of France, the Empress of Austria, the King of Italy, the President of the United States, and the two Spanish Prime Ministers. Unfortunately, such anarchical terrorism was reduced not by effective policy measures to counter it, but rather by bigger events like World War I. Hoffman (1998) gives a more detailed history of terrorism emphasizing that its inspirations, through the centuries, have swung back and forth between religious, ethno-national, and ideological motives. The recent revival of religious terror, according to Hoffman, stems from the breakdown of the post Soviet state and the failure to achieve reforms in Islamic countries in the wake of the Iranian revolution. Whatever the specific causes be, religious terrorism is particularly pernicious because their foot soldiers are indoctrinated to believe that their acts of violence are a divine duty that free them from any moral constraints on behavior.

Terrorism creates anxiety and makes people become more guarded about the potential harm imbedded in any transaction, be it a home delivery of a package or air travel. Counterterrorist policies tend to exacerbate the impact of terrorism on trading costs. To detect potentially harmful cross-border transactions, flows of people and goods must be subject to costly inspection and monitoring. This translates into a reduction of total factor productivity and real income. While all transactions are subject to this cost, cross-border transactions receive special attention, based either on evidence or the assumption that lethal components are more likely to be imbedded in foreign goods or in foreign people than in domestic ones. This was certainly the reaction of the U.S. government following the destruction of the twin towers on September 11, 2001: the national border was completely shut down for hours and subsequently was made much less permeable for "terrorists, weapons of mass destruction, illegal migrants, contraband, and other unlawful commodities" (White House, 2002). Qualitatively similar reactions took place in member countries of the European Union, which created an anti-terrorist coordinating position; see *Financial Times* (August 1, 2005).

Direct evidence that less permeable borders slows down cross-border traffic can be gleaned from newspaper accounts on the impact of tighter U.S. visa requirements on migration flows. The *Financial Times* of June 2, 2004 reports that, "… nearly three-quarters of [surveyed] companies had experienced unexpected delays or arbitrary denials of business visa, while 60% said that the delays had hurt their companies through increased costs or lost sales."

Coordination in border policies is likely to be imperfect at best, leading to differences in degrees of border permeability and trading costs. Furthermore, countries may use such differences to obtain a competitive advantage. According to a survey conducted by the Council of Graduate Schools, foreign applications to U.S. colleges and universities fell 32% during the last reporting period over the previous one; for Chinese graduate applications the drop was 76% (*Financial Times*, April 29, 2004). In contrast, foreign applications have been rising in Australia, Canada, and the United Kingdom. U.S. Secretary of State Colin Powell is reported as saying "that international scientific exchanges and conferences in the U.S. have become almost impossible to organize because of the new restrictions …. This hurts us. It is not serving our interests. And so we really do have to work on it" (*Financial Times*, April 23, 2004).

Not surprisingly, U.S. universities have been pressing the department of Homeland Security to review border procedures for foreign students.

2. TESTING FOR TRADING COSTS AND BORDER EFFECTS

The gravity equation has had considerable success in explaining bilateral trade flows in terms of income, population, distance as a proxy of trading costs, and country characteristics; for a review see Fratianni (chapter 2). A stylized representation is given by Eq. (1):

$$\ln(x_{ijt}) = \alpha_0 + \alpha_1 \ln(y_i y_j)_t + \alpha_2 \ln(I_i I_j)_t + \alpha_3 \ln(D_{ij}) + \alpha_4 B_{ij} + \alpha_5 F_{ij} + \varepsilon_{ijt} \quad (1)$$

where x_{ijt} is the real bilateral trade between country i and country j at time t; y the real gross domestic product; I the per capita real GDP; D_{ij} the distance between i and j; B_{ij} the dummy variable that is equal to one when the country pair i and j have a common land border, otherwise is zero; F_{ij} the vector of other time-invariant factors that include, among others, common language, common colonial ties, and common institutions; and ε_{ijt} the disturbance term. Bilateral trading costs, τ_{ij}, are unobservable and are posited to be related to distance by the relationship $\tau_{ij} = D_{ij}^{\alpha_3}$, where α_3 is the elasticity of bilateral trade with respect to distance. National borders create a discontinuity in distance and, thus, a jump in transaction and regime costs. These costs are driven by differences in legal systems and practices, languages, networks, competitive policies, monetary regimes, and tariffs or tariff-equivalent restrictions; like transportation, these costs show up by creating a wedge between the price paid by consumers in the importing country and the exporter's net supply price.

Terrorism and counterterrorism policies raise trading costs and border thickness. To the extent that terrorism works like crime, we should expect its impact to be greater for close neighborhoods and become progressively weaker as trading partners are separated farther away. In essence, terrorism-related trading costs ought to decline, other factors being equal, with distance. Terrorism also hardens national borders and, consequently, widens the price wedge and creates a mixture of substitution of home transactions for cross-border transactions and "trade diversion." To see these effects, assume that the world consists of Canada, Mexico, and the United States, and that the United States hardens its border with Mexico, but not with Canada. Also assume that the higher bilateral border barrier raises Mexican import price from the United States and vice versa. U.S. exporters would substitute the home market for the Mexican market. On the other hand, assuming substitutability between Canadian and U.S. goods in

Mexico, U.S. exports to Mexico would be partly replaced by Canadian exports. Similar considerations would hold for Mexican exports to the United States. The harder bilateral border would generate a mixture of substitution of home transactions for cross-border transactions, and trade diversion from country pairs with harder borders to softer borders. This is essentially the implication of Anderson and van Wincoop (2003), whose gravity model responds not only to bilateral trading costs, but also to "multilateral resistance" factors that depend on all bilateral trading costs. In sum, a hardening of the border will reduce and redirect cross-border trade unless a policy-driven liberalization can compensate for the higher trading costs.

To test for the effects of terrorism on bilateral trade flows, we treat Eq. (1) as being subject to an omitted variable problem, namely terrorism. This variable enters the gravity equation as an additional intercept shift parameter so that the overall level can change and also as a dummy variable interacting with both distance and common land border countries. The estimate of the level shift parameter will give us a measure of the reduction in bilateral trade that flows due to terrorism holding all the factors in the model constant. The estimate of the interacting dummy variable with distance will give us a measure of the impact of terrorism on trading costs. These trading costs are expected to decline, as countries are farther apart. Terrorism severely hits neighboring countries, which are empirically defined as those sharing a common land border. The estimate of the interacting dummy variable with common land border countries will give us an estimate of the "costs" of the hardening of the border on trade. With these considerations, we modify Eq. (1) as follows:

$$\begin{aligned}\ln(x_{ijt}) = \alpha_0 + \alpha_1 \ln(y_i y_j)_t + \alpha_2 \ln(I_i I_j)_t + \alpha_3 \ln(D_{ij}) + \alpha_4 B_{ij} \\ + \alpha_5 F_{ij} + \alpha_6 T_{ijt} + \alpha_7 T_{ijt} \ln(D_{ij}) + \alpha_8 T_{ijt} B_{ijt} + \varepsilon_{ijt}\end{aligned} \tag{2}$$

where T stands for terrorism and is measured by binary variables; see below. The expected values of the coefficients are as follows: α_1, α_2, α_4, and α_7 are positive; α_3, α_6, and α_8 are negative; and α_5 can be either positive or negative depending on whether cultural and institutional variables are trade enhancing or trade contracting. We will also test whether the effects of terrorism on trade are robust in the presence of other calamities, such as natural disasters, technological disasters, and banking and currency crises. In addition, we test the robustness when the quality of national institutions is also controlled for.

2.1. Data

Table 1 reports a few descriptive statistics of bilateral trade flows and explanatory variables for Eq. (2) using a large sample of 97,803 country-pair observations over the period 1980–1999. The description of the data underlying the benchmark gravity Eq. (1) can be found in the Technical Appendix at the end of the volume. When natural and technological disasters are added, the number of observations reduces to 96,804. Due to the limited coverage of other data sources, the number of observations further reduces to 62,949 and then to 23,224, respectively, as we add institutional quality variable and then banking and currency crises. For each data set, we report the mean, standard deviation, minimum, and maximum of our dependent variable real trade flows. The mean real trade flow increases from 218 million dollars to 220 million dollars, and then to 282 million dollars. When banking and currency crises are added, the mean real trade flow is 724 million dollars, indicating that banking and currency crisis data are only obtained among rather large countries. Except for the banking and currency crisis data, the coverage and the characteristic of other economic data are about the same; the sample size gets reduced from 97,803 to 62,949. Here, we discuss the measurement of terrorism, natural disasters, technological disasters, banking crises, and currency crises.

For international terrorism, we have used the International Terrorism Attributes of Terrorist Events databank (ITERATE) from Mickolus, Sandler, Murdock, and Fleming (2003); see Sandler and Enders (2004) for a general assessment of this database. ITERATE collects event counts, except for number of casualties, and has been widely used in economics and political science; see, for example, Atkinson, Sandler, and Tschirhart (1987); Cauley and Im (1988); Bloomberg, Hess, and Orphanides (2004); Li and Schaub (2004); and Nitsch and Schumacher (2004). Our terrorism variables are "BothT" = 1 when both trading partner countries have experienced an act of terrorism, otherwise 0, and "OnlyoneT" = 1 when only one of the two countries in the pair has experienced an act of terrorism, otherwise 0.

For disasters, we have employed the Emergency Events Database (EM-DAT) from the Centre for Research on the Epidemiology of Disaster at Université Catholique de Louvain in Belgium. EM-DAT collects 13 types of natural disasters and three types of technological disasters.[2] OECD (1994) assesses that EM-DAT is the closest approximation to a global hazard and disaster database. Like ITERATE, EM-DAT is widely cited in disaster research and in economics and political science; see, for example, Skidmore and Toya (2002); Auffret (2003); and Tavares (2004). Like terrorism, natural

Table 1. Summary Statistics.

Variable	Obs.	Mean	Std. Dev.	Min	Max
Real trade flow[a]	97,803	2,180,700	1.75E+07	0.00015	1.09E+09
Log (real trade flow)	97,803	10.7692	3.0379	−8.8161	20.8112
Log of real GDP[a]	97,803	48.8429	2.5088	38.6652	59.0900
Log (real per capita GDP)[a]	97,803	16.4559	1.5084	9.9005	21.3783
Log (distance)[b]	97,803	8.2135	0.7692	4.0168	9.4215
Common border	97,803	0.0244	0.1543	0	1
Common language	97,803	0.2105	0.4077	0	1
Common country	97,803	0.0003	0.0166	0	1
Common colonizer	97,803	0.0821	0.2745	0	1
Colonial relationship	97,803	0.0212	0.1441	0	1
Common currency	97,803	0.0069	0.0827	0	1
Common RTA	97,803	0.0222	0.1473	0	1
Inter-regional	97,803	0.1204	0.3254	0	1
Sum terrorism	97,803	1.0174	0.7032	0	2
Both terror	97,803	0.2561	0.4365	0	1
BothT × log (distance)	97,803	2.0923	3.5905	0	9.419
BothT × border	97,803	0.0090	0.0944	0	1
Only one terror	97,803	0.5052	0.5000	0	1
OnlyoneT × log (distance)	97,803	4.1632	4.1519	0	9.4215
OnlyoneT × border	97,803	0.0091	0.0949	0	1
Both natural disaster	96,864	0.3452	0.4754	0	1
BothNat × log (distance)	96,864	2.8736	3.9826	0	9.4215
BothNat × border	96,864	0.0112	0.1051	0	1
Only one natural disaster	96,864	0.4831	0.4997	0	1
OnlyoneNat × log (distance)	96,864	3.9764	4.1447	0	9.4215
OnlyoneNat × border	96,864	0.0087	0.0929	0	1
Both technological disaster	96,864	0.1730	0.3783	0	1
BothTech × log (distance)	96,864	1.4365	3.1554	0	9.4215
BothTech × border	96,864	0.0057	0.0754	0	1
OnlyoneTech. disaster	96,864	0.4807	0.4996	0	1
OnlyoneTech × log (distance)	96,864	3.9721	4.1603	0	9.4215
OnlyoneTech × border	96,864	0.0099	0.0992	0	1
Real trade flow	96,864	2,197,638	1.76E+07	0.00015	1.09E+09
Institutional quality	62,949	4.8434	0.1847	3.6636	5.2470
Institutional Quality × log (distance)	62,949	39.8351	4.0779	18.45768	48.91247
Institutional Quality × border	62,949	0.1174	0.7419	0	5.2257
Real trade flow	62,949	2,819,222	2.08E+07	0.00015	1.09E+09
Both banking crisis	23,224	0.0035	0.0593	0	1
BothBank × log (distance)	23,224	0.0288	0.4867	0	9.3912
BothBank × border	23,224	0.0003	0.0174	0	1
Onlyone banking crisis	23,224	0.1082	0.3106	0	1
OnlyoneBank × log (distance)	23,224	0.9161	2.6411	0	9.4190
OnlyoneBank × border	23,224	0.0033	0.0571	0	1
Both currency crisis	23,224	0.0065	0.0806	0	1
BothBank × log (distance)	23,224	0.0560	0.6927	0	9.4190
BothBank × border	23,224	0.0002	0.0147	0	1
Onlyone currency crisis	23,224	0.1629	0.3693	0	1
OnlyoneCurr × log (distance)	23,224	1.3790	3.1404	0	9.4190
OnlyoneCurr × border	23,224	0.0050	0.0702	0	1

Table 1. (*Continued*)

Variable	Obs.	Mean	Std. Dev.	Min	Max
Real trade flow	23,224	7,243,371	3.33E + 07	0.00883	1.02E + 09

[a]Real trade flows are in hundreds of U.S. dollars. Real GDP and real per capita GDP are expressed in U.S. dollar. The base year of real trade flows, real GDP, and real per capita GDP is 1982–1984.
[b]The unit of distance is the mile.

disasters and technological disasters are defined as a binary variable, using the same scheme as terrorism.[3] The reason for a binary variable rather than a cardinal variable, like number of people killed in a disaster, is justified by the incentive that developing countries may have in exaggerating reports of calamities to secure international assistance (Albala-Bertrand, 1993).

For the quality of institutions, we have used the political risk index compiled by the International Country Risk Guide (ICRG) created and maintained by Political Risk Services. The index measures 12 different aspects of institutional quality, ranging from government stability to democratic accountability.[4] The ICRG database has been used in important studies, such as Hall and Jones' (1999) research on the link between labor productivity and social infrastructure and La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998) on legal protection of investors. Our measure of institutional quality for the country pair is the logarithm of the sum of the two countries' scores.

For currency and banking crises, we have relied on the compilation by Bordo, Eichengreen, Klingebiel, and Martinez-Peria (2001) of the original data source of IMF (1998), which has been frequently cited in research on financial crises; see, for example, Tavares (2004). Our measure of banking crises and currency crises are binary variables, using the same scheme of terrorism.[5]

2.2. Empirical Findings

We start with a discussion of Nitsch and Schumacher (2004). In column 2 of Table 2, we report the authors' original estimates of the gravity equation when terrorism is defined as the sum of "the (additively linked) dummy of at least one terrorist action" (p. 429). The sum of the two dummies is a trinary variable defined as 0 when neither country suffers from terrorism, 1 when one country suffers from terrorism, and 2 when both countries suffer from

Table 2. The Nitsch and Schumacher (2004) Model.

Variable	Nitsch and Schumacher		Our Equation
	(1968–1979)	(1980–1999)	(1980–1999)
Intercept	Not reported	−28.9905***	−29.1546***
		(0.1366)	(0.1375)
Log of real GDP	0.800***	0.8383***	0.8396***
	(0.004)	(0.0026)	(0.0026)
Log of real per capita GDP	0.550***	0.4979***	0.4820***
	(0.006)	(0.0043)	(0.0044)
Log of distance	−1.053***	−1.0940***	−1.0506***
	(0.010)	(0.0077)	(0.0081)
Common border	0.361***	0.4565***	0.3663***
	(0.047)	(0.0384)	(0.0381)
Common language	0.312***	0.4242***	0.3835***
	(0.020)	(0.0147)	(0.0146)
Common country	1.221***	0.6892**	0.5655**
	(0.280)	(0.3186)	(0.2747)
Common colonizer	0.783***	0.6317***	0.5916***
	(0.031)	(0.0249)	(0.0249)
Colonial relationship	1.795***	1.3528***	1.3572***
	(0.044)	(0.0285)	(0.0285)
Common currency			0.9513***
			(0.0742)
Common RTA			0.9241***
			(0.0359)
Inter-regional			0.1729***
			(0.0153)
Time fixed dummies	Estimated but not reported here		
Sum terrorism dummy	−0.098***	−0.0081	−0.0130
	(0.018)	(0.0088)	(0.0088)
Obs.	59,780	97,803	97,803
R^2	0.63	0.6823	0.6850
Test statistics			F (3,97772) = 304.60
Additional variables are jointly 0			Prob > F = 0.0000

Note: Robust standard errors are shown in parentheses.
**Statistical significance at the 5% level.
***Statistical significance at the 1% level.

terrorism. We refer to this as "Sum Terrorism Dummy." It should be noted that although Nitsch and Schumacher use the term "dummy variable" to indicate it, it is a trinary, not a binary dummy variable. Use of the trinary variable assumes that the impact of terrorism when both countries suffer from terrorism would be twice as large as the effect when only one country suffers from it.

Moreover, Nitsch and Schumacher restrict their sample period to the years 1968–1979, apparently because they use terrorism data from Mickolus (1980), even though the electronic-based ITERATE goes well beyond 1979. The salient result in Nitsch and Schumacher is that the "Sum Terrorism Dummy" has a statistically significant negative coefficient and an economic impact of reducing bilateral trade by almost 10% if one country is affected by terrorism and 20% if both countries are affected by it.[6] The "Sum Terrorism Dummy" variable is reported as being significant at the 1% level. We reproduced the Nitsch and Schumacher experiment for the period 1980–1999, by using the same "Sum Terrorism Dummy" variable and found that the statistical significance of the trend disappears; see column 3 of Table 2. In fact, the variable is no longer significant even at the 10% level. The trinary variable remains statistically insignificant even with our specification of the gravity equation; see last column of Table 2. The results in this column are very similar to those in the literature, where common RTA and inter-regional variables are added in addition to the variables in Nitsch and Schumacher. In sum, the impact of the terrorism discovered by Nitsch and Schumacher appears to be sample specific and evident only when the terrorism is measured in this particular, unconventional way. We found it unproductive to pursue this line of inquiry further. Instead, we use two separate dummy variables for terrorism and we include their interaction terms with both distance and common borders.

Table 3 shows results on terrorism, distance, and border based on Eq. (2). In column 2 of Table 3, terrorism enters the equation only as a level (or intercept term) shift parameter, in column 3 it also interacts with distance, and in column 4 with common land borders. All the coefficient estimates of the six terrorist variables are statistically significant at least at the 10% level and have the expected sign. The interaction between terrorism and common land borders is economically strong, stronger than the level shift parameter. Pairs of countries in which both partners suffer from terrorism trade 62% less than country pairs not subject to terrorism; pairs in which only one country suffers from terrorism trade 41% less than country pairs not subject to terrorism. The level effect of terrorism on all bilateral trade implies a reduction of 25% in bilateral trade flows when both countries experience terrorism and 32% when only one country experiences terrorism.[7]

Terrorism-related trading costs decline as distance between trade partners increases. For example, the elasticity of real bilateral trade flows with respect to distance for both countries experiencing terrorism is -1.035

Table 3. Distance, Border, and Terrorism.

Variable	With Terrorism Variable	With Distance Interaction	Distance and Border Interaction
Intercept	−29.1202***	−28.5576***	−28.9563***
	(0.1380)	(0.1765)	(0.1854)
Log of real GDP	0.8394***	0.8396***	0.8394***
	(0.0026)	(0.0026)	(0.0026)
Log of real per capita GDP	0.4819**	0.4838***	0.4843***
	(0.0044)	(0.0044)	(0.0044)
Log of distance	−1.0504***	−1.1240***	−1.0770***
	(0.0081)	(0.0160)	(0.0173)
Common border	0.3622***	0.3654***	0.9167***
	(0.0381)	(0.0379)	(0.0801)
Common language	0.3837***	0.3860***	0.3893***
	(0.0146)	(0.0146)	(0.0146)
Common country	0.5825**	0.5869**	0.5910**
	(0.2748)	(0.2761)	(0.2772)
Common colonizer	0.5879***	0.5823***	0.5819***
	(0.0250)	(0.0249)	(0.0249)
Colonial relationship	1.3612***	1.3604***	1.3599***
	(0.0286)	(0.0286)	(0.0284)
Common currency	0.9488***	0.9022***	0.8688***
	(0.0741)	(0.0745)	(0.0739)
Common RTA	0.9169***	0.9229***	0.9455***
	(0.0359)	(0.0359)	(0.0360)
Inter-regional	0.1728***	0.1686***	0.1660***
	(0.0153)	(0.0153)	(0.0153)
Time fixed dummies		Estimated but not reported here	
Both terrorism	−0.0284	−1.0109***	−0.2870*
	(0.0178)	(0.1572)	(0.1730)
Onlyone terrorism	−0.0581***	−0.7597***	−0.3770**
	(0.0154)	(0.1538)	(0.1686)
BothT × log (distance)		0.1198***	0.0349*
		(0.0192)	(0.0210)
OnlyoneT × log (distance)		0.0854***	0.0405**
		(0.0187)	(0.0203)
BothT × border			−0.9699***
			(0.0966)
OnlyoneT × border			−0.5306***
			(0.1010)
Obs.	97,803	97,803	97,803
R^2	0.6851	0.6852	0.6855
Test statistics	$F(2, 97770) = 8.30$	$F(4, 97768) = 13.65$	$F(6, 97766) = 27.51$
Additional variables are jointly 0	Prob > F = 0.0000	Prob > F = 0.0000	Prob > F = 0.0000

*Statistical significance at the 10% level.
**Statistical significance at the 5% level.
***Statistical significance at the 1% level.

against an elasticity of -1.08, for countries not subject to terrorism. The numerically smaller elasticity of terrorism-prone countries partially offsets the negative impact of terrorism working through the level shift parameter. The differential elasticities also corroborate the proposition that terrorism has differentiated location effects. The interaction of terrorism with common border shows that the impact of terrorism for non-neighboring countries also works in the opposite direction of the level shift parameter. To see more clearly how terrorism interacts with distance and border, we have selected three pairs of trading partners, which all have experienced terrorism in the same year in the sample. Israel and Jordan share a common land border; Pakistan and Tunisia are separated by about the average distance in the sample (3,527 miles), and Ecuador and Singapore have the greatest distance in the sample (12,320 miles). The impact of terrorism – measured by the level shift parameter, the terrorism dummy interacting with distance, and the terrorism dummy interacting with common border – reduces the logarithm of real bilateral trade flows by 9.4% between neighboring Israel and Jordan, but only by 0.022% between Pakistan and Tunisia at an average distance; on the other hand, terrorism actually raises the logarithm of bilateral trade by 0.41% between the very distant Ecuador and Singapore. For this last pair of countries, the positive border interaction effects more than offsets the negative impact working through the level shift parameter; see Table 4. These patterns are consistent with terrorism redistributing trade flows from close to distant countries.

The above findings appear to be robust in the presence of other calamities, such as natural and technological disasters, the quality of national institutions, and banking and currency crises; see Table 5. Natural disasters, in contrast to terrorism, have statistically negative effects across all countries but positive ones for neighboring countries. Technological disasters, on the other hand, have a statistically positive level effect but a negative one for common border countries. This pattern may reflect different responses by neighboring countries to different kinds of disasters. Natural disasters may prompt neighbors to embark on cooperative strategies that enhance bilateral trade flows. Technological disasters may instead spark protectionist responses that reduce trade flows. The estimated coefficients of the banking and currency crises dummy variables are either statistically insignificant or positive. It should be noted that banking and currency crises are much less numerous than other calamities and the characteristics of the sample are different from those without them as shown in Table 1, a possible reason for the odd result in the estimation. Institutional quality has a strong positive intercept impact on bilateral trade flows but a negative one for neighboring

Table 4. Impact of Terrorism on Selected Pairs of Countries.

Variable	Distance and Border Interaction	Both Countries in the Pair Experience Terrorism			
		Common Border Countries	Israel–Jordan: A Common Land Border Pair	Pakistan–Tunisia: Mean Distance Pair	Ecuador–Singapore: Maximum Distance Pair
Intercept	−28.9563	−28.9563	−28.9563	−28.9563	−28.9563
Log of real GDP	0.8394	42.3377	40.4077	41.5799	40.3134
Log of real per Capita GDP	0.4843	8.0828	8.3422	7.3395	8.3134
Log of distance	−1.0770	−6.7811	−4.7383	−8.7973	−10.1443
Common border	0.9167	0.9167	0.9167	0	0
Common language	0.3893	0.3893	0.3893	0	0
Common country	0.5910	0	0	0	0
Common colonizer	0.5819	0	0.5819	0	0
Colonial relationship	1.3599	0	0	0	0
Common currency	0.8688	0	0	0	0
Common RTA	0.9455	0	0	0	0
Inter-regional	0.1660	0	0	0	0.1660
Effects excluding terrorism[a]	(1)	12.6446	16.9432	11.1658	9.6922
Both terrorism	−0.2870	−0.2870	−0.2870	−0.2780	−0.2870
BothT × log (distance)	0.0349	0.2197	0.1535	0.2851	0.3287
BothT × border	−0.9699	−0.9699	−0.9699	0	0
Terrorism effects[a]	(2)	−1.0372	−1.1034	−0.0019	0.0417
Sum of all effects[a]	(3) = (1) + (2)	109,913	7,571,052	70,536	16,881
Actual log of real bilateral trade[a]	(4)	14.6065	11.7381	8.5260	10.2057
Impact of terrorism as a percent of predicted values	(2)/(3)	−8.9%	−6.1%	−0.017%	0.43%
Impact of terrorism as a percent of actual values	(2)/(4)	−8.9%	−9.4%	−0.022%	0.41%

[a]Units are in hundreds of dollars.

countries; this too is counter to our expectation. In sum, a few unexplainable aspects notwithstanding, the salient aspect of Table 5 is that the addition of other calamities does not alter the statistical and economic significance of terrorism on bilateral trade flows.

We report the economic significance of terrorism on trade in Table 6. Column 1 shows the estimates of the coefficients, reported in column 3 of Table 3, multiplied by the (sample) mean value of the corresponding variables of the simple specification of the gravity equation. The predicted value of the log of bilateral trade without any terrorism is 12.0828. Column 2

Table 5. Terrorism, Disasters, Institutional Quality, and Financial Crises.

Variable	Terrorism, Disasters, and Institutional Quality		Terrorism, Disasters, Institutional Quality, and Financial Crises	
Intercept	−31.1913***	−39.2143***	−34.3366***	−41.9867***
	(0.2342)	(0.3189)	(0.4369)	(0.5454)
Log of real GDP	0.8497***	0.8502***	0.8486***	0.8523***
	(0.0033)	(0.0040)	(0.0048)	(0.0058)
Log of real per capita GDP	0.4921***	0.3352***	0.7555***	0.5472***
	(0.0054)	(0.0071)	(0.0096)	(0.0145)
Log of distance	−0.9751***	−0.9716***	−1.0687***	−1.0604***
	(0.0218)	(0.0217)	(0.0414)	(0.3977)
Common border	1.1582***	9.0211***	0.5899***	8.5814***
	(0.1037)	(0.8995)	(0.1684)	(1.4592)
Common language	0.3947***	0.4037***	0.5297***	0.5522***
	(0.0175)	(0.0173)	(0.0239)	(0.0238)
Common country	NA	NA	NA	NA
Common colonizer	0.5434***	0.6453***	0.7596***	0.9078***
	(0.0325)	(0.0325)	(0.0744)	(0.0746)
Colonial relationship	1.1614***	1.1297***	0.5795***	0.5776***
	(0.0356)	(0.0341)	(0.0426)	(0.0414)
Common currency	0.9469***	0.8617***	NA	NA
	(0.1218)	(0.1135)		
Common RTA	0.5929***	0.5895***	0.2254***	0.2541***
	(0.0412)	(0.0399)	(0.0396)	(0.0384)
Inter-regional	0.1445***	0.1464***	0.0814***	0.0881***
	(0.0172)	(0.0169)	(0.0208)	(0.0204)
Time fixed dummies	Estimated but not reported here			
Both terrorism	0.9123***	1.0099***	−1.2763***	−1.3606***
	(0.2133)	(0.2119)	(0.3747)	(0.3592)
Onlyone terrorism	0.2149	0.3759*	−0.9409**	−0.9743***
	(0.2116)	(0.2094)	(0.3884)	(0.3714)
BothT × log (distance)	−0.1106***	−0.1085***	0.1199***	0.1396***
	(0.0258)	(0.0256)	(0.0443)	(0.0425)
OnlyoneT × log (distance)	−0.0285	−0.0410	0.0920**	0.1015**
	(0.0255)	(0.0252)	(0.0458)	(0.0438)
BothT × border	−1.2505***	−1.1416***	−0.8450***	−0.8149***
	(0.1189)	(0.1155)	(0.1787)	(0.1642)
OnlyoneT × border	−0.7764***	−0.7075***	−0.3901***	−0.3828**
	(0.1276)	(0.1211)	(0.1966)	(0.1774)
Both natural disaster		−0.0991***		−0.2738***
		(0.0237)		(0.0375)
Onlyone natural disaster		−0.0517**		−0.1974***
		(0.0212)		(0.0343)

Table 5. (*Continued*)

Variable	Terrorism, Disasters, and Institutional Quality		Terrorism, Disasters, Institutional Quality, and Financial Crises	
BothNat × border		0.1971*		0.4401***
		(0.1156)		(0.1258)
OnlyoneNat × border		0.0076		0.4838***
		(0.1127)		(0.1274)
BothTech. disaster		0.0213		0.1194***
		(0.0225)		(0.0333)
OnlyoneTech. disaster		−0.0003		0.0403
		(0.0178)		(0.0281)
BothTech × border		−0.4303***		−0.3389***
		(0.1179)		(0.1265)
OnlyoneTech × border		−0.2186**		−0.0267
		(0.1002)		(0.1151)
Institutional quality		2.1328***		2.2525***
		(0.0586)		(0.1084)
Institutional quality × border		−1.6174***		−1.6759***
		(0.1814)		(0.2836)
Both banking crisis				0.3297
				(0.2299)
Onlyone banking crisis				0.1544***
				(0.0398)
BothBank × border				−0.3612
				(0.4410)
OnlyOneBank × border				0.0240
				(0.1550)
Both currency crisis				0.0674
				(0.1502)
Onlyone currency crisis				−0.0467
				(0.0337)
BothCurr × border				1.4172**
				(0.6757)
OnlyOneCurr × border				0.1491
				(0.1332)
Obs.	62,233	62,233	17,829	17,829
R^2	0.7043	0.7118	0.7964	0.8041
Test statistics Additional variables are jointly 0	$F(10, 62191) = 138.59$ Prob $> F = 0.0000$		$F(8, 17781) = 3.73$ Prob $> F = 0.0002$	

Note: Robust standard errors are shown in parentheses.
*Statistical significance at the 10% level.
**Statistical significance at the 5% level.
***Statistical significance at the 1% level.

Table 6. Marginal Economic Significance of Terrorism, Disasters, and Institutional Quality.

Variable	Both Countries had Terrorism Activities (Distance and Border Interaction)		Both Countries had Natural Disaster and Tech. Disaster (Terrorism, Disasters, Institutional Quality, and Financial Crises)		Decreasing Unit Standard Deviation of Institutional Quality (Terrorism, Disasters, Institutional Quality, and Financial Crises)	
Intercept	−28.9563	−28.9563	−39.2143	−39.2143	−39.2143	−39.2143
Log of real GDP	40.9987	40.9987	42.0203	42.0203	42.0203	42.0203
Log of real per capita GDP	7.9696	7.9696	5.5424	5.5424	5.5424	5.5424
Log of distance	−8.8459	−8.8459	−7.9940	−7.9940	−7.9940	−7.9940
Common border	0.9167	0.9167	9.0211	9.0211	9.0211	9.0211
Both terrorism		−0.2870	1.0099	1.0099	1.0099	1.0099
BothT × log (distance)		0.2867	−0.8927	−0.8927	−0.8927	−0.8927
BothT × border		−0.9699	−1.1416	−1.1416	−1.1416	−1.1416
Both natural disaster				−0.0991	−0.0991	−0.0991
BothNat × border				0.1971	0.1971	0.1971
BothTech. disaster				0.0213*	0.0213*	0.0213*
BothTech × Border				−0.4303	−0.4303	−0.4303
Institutional quality			10.3304	10.3304	10.3304	9.9363
Institutional quality × border			−7.8340	−7.8340	−7.8340	−7.5351
Predicted value of log of bilateral trade	12.0828	11.1125	10.8474	10.5364	10.5364	10.4412
Marginal impact as a percent of predicted value		−8.03		−2.87		−0.90
Number of observation	97,803	97,803	62,233	62,233	62,233	62,233

*Statistically insignificant. Effects are calculated as coefficients multiplied by mean values. For example, the coefficient and the mean value of log of real GDP in Table 3 is 0.8394 and 48.8429, respectively. Therefore, the effect is 40.9987 (= 0.8394 × 48.8429). Mean values are obtained from each sample. For instance, the mean value of log of real GDP in column 3 of Table 5 is 49.4240. We do not report each sample mean value here. Decreasing institutional quality is defined by a reduction of one standard deviation of institutional quality. Marginal impact measures the difference in the predicted value of the equation estimated with the variables indicated in the column relative to the prediction of the equation without those variables. For example, −8.03 = (11.1125/12.0828–1) × 100.

shows the prediction of a specification when terrorism is added to the previous column under a scenario that both trading partners suffer from terrorism. The predicted log bilateral trade is 11.1125. Terrorism the accounts for a reduction of 8.03% in the logarithm of bilateral trade flows predicted when terrorism is excluded; call it the marginal impact of terrorism. With a similar procedure, we compute the marginal impact of disasters (columns 3 and 4) and institutional quality (columns 5 and 6). Disasters, conditional on terrorism and institutional quality, reduce the predicted logarithm of bilateral trade by 2.87%. A one standard deviation decline in institutional quality, conditional on terrorism, disasters, and institutional quality, reduces the logarithm of bilateral trade by 0.9%. In sum, the exercise confirms the economic importance of terrorism against the background of disasters and quality of institutions. The impact of terrorism is by far larger than the impact of other disasters and crises. The trading partners sharing common land borders and terrorism activities have an extra burden of higher transaction costs that reduce their trade, in logarithmic terms, by 8%.

3. IMPLICATIONS OF BORDER POLICY

We have seen that terrorism exerts a large negative impact on trade by raising trading costs. By hardening borders, especially between neighboring trading partners, terrorism contributes to higher trading costs and to the subsequent substitution of home trade for cross-border trade. These effects are likely to be much higher for small and open economies than for large and relatively closed economies. Another adjustment resulting from the hardening of the borders comes from the redistribution of trade from country pairs with higher trading costs to country pairs with lower trading costs. Our evidence shows that terrorism redistributes and diverts trade from neighboring to distant countries suffering from terrorism. Trade redistribution and diversion are likely to be much more widespread when countries adopt different border policies, with soft-barrier countries gaining trade at the expense of hard-barrier countries.

The negative consequences of harder border policies could be partially offset by cooperative arrangements. Neighboring countries tend to trade more than distant countries and have more to lose by not cooperating. As an example, the United States has long land borders with both Canada and Mexico. Canada is the most important trading partner of the United States and Mexico is the third. Failure to cooperate on common border policies would induce substitution of home for cross-border transactions. Since these substitutions would be deeper in Mexico and Canada than in the United States, Canada and Mexico would have a greater incentive to follow U.S. border policy than the United States to follow either Canadian or Mexican border policies. Similarly, in the European Union the large member countries have incentives to set their own harder border policies and the small ones have incentives to follow those policies.

Cooperative arrangements on border policy may actually accelerate the process of regional deepening, as evidenced from our results; see Table 3. Regional trade agreements with homogeneous countries and preferences would be the fastest in implementing such a perimeter. Customs unions would face lower coordinating costs than free trade associations. In sum, security concerns would make the world less global and hence more regional.

4. CONCLUSIONS

The main thesis of this paper is that terrorism exerts a negative impact on bilateral trade flows by raising trading costs and hardening borders. The evidence marshalled in this paper indicates that neighboring countries suffering from terrorism trade considerably less than countries not subject to it. As distance increases between countries, the impact of terrorism declines. That is, the elasticity of bilateral trade with respect to distance declines for terrorism-affected countries, suggesting that some trade is redirected from close to more distant countries as a result of terrorism. The positive impact working through distance tends to offset the negative impact working through the level shift parameter. These findings are robust in the presence of natural disasters, technological disasters, the quality of national institutions, banking crises, and currency crises.

The economic consequences of safer borders are likely to hit hardest small and open economies and to increase the home bias of international trade. It will also divert cross-border trade toward countries with smaller border restrictions. In an attempt to minimize the cost of hardened borders, some regional trade agreements may experiment with common security perimeters. This, in turn, will lead to a deeper regional trade bias.

NOTES

1. For Jihadist, read Anarchist (2005).
2. Natural disasters include droughts, earthquakes, extreme temperatures, famines, floods, slides, volcanic eruptions, waves/surges, wild fires, windstorms,

epidemics, and insect infestations. Technological disasters include industrial, transport, and miscellaneous accidents. See http://www.em-dat.net/ for definitions and data.

3. BothNat and OnlyoneNat denote, respectively, both countries and only one country in the pair experiencing natural disasters. BothTech and OnlyoneTech have similar meanings for technological disasters.

4. The complete list includes government stability (12% weight), socioeconomic conditions (12%), investment profile (12%), internal conflict (12%), external conflict (12%), corruption (6%), military in politics (6%), religion in politics (6%), law and order (6%), ethnic tensions (6%), democratic accountability (6%), and bureaucratic quality (4%).

5. BothBank and OnlyoneBank denote, respectively, both countries and only one country in the pair experiencing a banking crisis. BothCurr and OnlyoneCurr are the corresponding variables for currency crises.

6. We ignore the authors' estimates when terrorism is defined as log (1 + number of terrorist actions), which give rise to the headline result that a doubling of terrorist attacks is associated with a 4% decline in bilateral trade.

7. The exponentiation of −0.9699, −0.5306, −0.287, and −0.377, are respectively 0.38, 0.59, and 0.75 and 0.68.

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CHAPTER 11

POLITICAL VIOLENCE AND FOREIGN DIRECT INVESTMENT

Quan Li

ABSTRACT

The international business literature presents an interesting intellectual puzzle regarding the effect of political instability and political risk on foreign direct investment (FDI). Survey evidence shows that multinational executives take into account political instability in making investment decisions, while econometric studies produce conflicting findings. In this paper, I offer a new theory that explains how political violence, an extreme form of political instability, affects FDI. The new theory differs from previous arguments on three points. First, the theory considers how rational expectations and uncertainty on the part of foreign investors affect the ways in which political violence influences investment behaviors. Second, the new theoretical argument argues for the need to investigate separately the effects of different types of political violence (civil war, interstate war, and transnational terrorism). Third, I consider FDI inflows as resulting from two distinct but related decisions, including the investment location choice and the decision on investment amount, and sort out statistically the separate effects of political violence on these two processes. The empirical analysis of FDI inflows covers about 129 countries from 1976 to 1996. The statistical findings largely support my theoretical expectations. My theory helps reconcile the inconsistent econometric findings on the effect of political instability on FDI flows.

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The international business literature presents an interesting intellectual puzzle regarding the effect of political instability and political risk on foreign direct investment (FDI). In an early review of studies on political risk, Kobrin (1979) concludes that the empirical evidence is inconsistent and mixed regarding the effect of political instability on FDI stocks or flows. Later econometric studies continue to produce mixed findings. For example, Schneider and Frey (1985) find that political instability has a negative effect on FDI flows. Nigh (1985) finds in an analysis of 24 countries over 21 years that both internation and intra-nation conflict and cooperation affect manufacturing FDI flows by U.S. firms. But Fatehi-Sedeh and Safizadeh (1989) fails to find statistical association between political stability and FDI. In a cross-sectional analysis of FDI flows to 36 countries for 1977 and 1982, Loree and Guisinger (1995) find that political stability significantly promotes FDI inflows in 1982, but not in 1977. Olibe and Crumbley (1997) do not find consistent evidence that political risk index influences U.S. FDI flows to 10 out of 13 OPEC countries. Using data from all reported manufacturing plant openings from 1984 to 1987, Woodward and Rolfe (1993) find that political stability increases the probability of a country being selected as an investment location. More recently, in a pooled analysis of 52 developing countries from 1982 to 1995, Li and Resnick (2003) do not find that political instability has any statistically significant effect on FDI inflows, but regime durability encourages FDI inflows. Sethi, Guisinger, Phelan, and Berg (2003) find that political instability, measured by a composite variable on a 100-point scale, does not influence U.S. FDI flows to 28 countries from 1981 to 2000. Globerman and Shapiro (2003) conduct a two-stage analysis of U.S. FDI flows to 143 countries from 1994 to 1997, in which the first stage investigates the causal factors of the probability that a country is an FDI recipient while the second stage examines the determinants of the amount of FDI received. They find that an index of political instability and violence, including armed conflict, social unrest, terrorist threats, etc., does not influence the probability whether a country receives any FDI inflow, but reduces the amount of FDI inflow a country receives. That is, the average size of an FDI transaction may change independently of the probability of a country receiving the FDI. The econometric evidence is obviously mixed and inconsistent across studies.

In contrast, evidence from studies of responses of executives to interviews and questionnaires (e.g., Bass, McGreggor, & Walters, 1977; Aharoni, 1966) typically demonstrates that political risk and stability are important considerations when investors make investment decisions. More recently, Porcano (1993) finds in a survey of Canadian, British, and Japanese firms of

36 industries that political climate in the host country is consistently ranked above 3 on a 5-point importance scale. The inconsistency of empirical evidence among econometric studies of FDI flows and the inconsistency between econometric findings and survey evidence are widely noted in various studies of the determinants of FDI (see, e.g., Pearce, Sauvant, & Islam, 1992).

Resolving this intellectual puzzle has important implications. First, the issue is important for the operation and theoretical understanding of international production. Assume that the mixed econometric evidence reflects the real nature of the relationship between political instability and FDI. Firm executives are then misled in decision-making by their own beliefs of the importance of political instability. Capital is not allocated to its most productive use. On the other hand, if the individual executives are correct in their perception of the importance of political instability, the conflicting econometric findings suggest that our theoretical understanding of the relationship between political instability and international production is flawed.

Second, the issue is also important for understanding the effect of an FDI on political violence. In the political science literature, national integration into international production is found to reduce dyadic military dispute (e.g., Gartzke, Li, & Boehmer, 2001; Gartzke & Li, 2003). FDI, particularly in the manufacturing sector, also is found to decrease civil conflict in poor countries by increasing resource availability and opportunities, while FDI in the wealthier countries appear to intensify class conflicts (Rothgeb, 1990). Furthermore, FDI inflows are found not to directly affect transnational terrorist incidents, but to indirectly reduce such incidents by promoting economic development in countries (Li & Schaub, 2004). A main underlying premise of these studies is that political violence affects foreign investment flows, which generates behavioral implications for a variety of political actors involved. To the extent that political violence does not have a logically consistent effect on FDI, one may need to reexamine the effects of FDI on political violence.

In this paper, I offer a new theoretical argument to explain how political violence, an extreme form of political instability, affects FDI. The new theory differs from previous arguments on three different issues. First, the theory considers how rational expectations and uncertainty on the part of foreign investors affect the ways in which political violence influences investment behaviors. Second, the new theoretical argument presents the need to investigate separately the effects of different types of political violence. Instead of applying an aggregate political instability or risk index, like typically has been done in the literature, I examine different forms of political violence, including civil war, interstate war, and transnational terrorism. Third, I consider FDI inflows as resulting from two distinct but related decisions, including the investment location choice and the decision on investment amount, and sort out statistically the separate effects of political violence on these two processes.

The empirical analysis of FDI inflows covers about 129 countries from 1976 to 1996. The statistical findings largely support my theoretical expectations. The new theoretical argument helps reconcile the inconsistent econometric findings on the effect of political instability on FDI flows.

1. HOW DOES POLITICAL VIOLENCE INFLUENCE FOREIGN DIRECT INVESTMENT?

The theory builds on the following elements. First, investors believe political instability in the host country is important for choosing investment locations and deciding the investment amount. Second, forward-looking investors constantly anticipate the effect of political violence in the host country. Third, investors do not have perfect foresight and have to manage unanticipated political violence ex post. Fourth, political violence comes in different types, some of the most extreme of which include civil war, interstate war, and transnational terrorist attacks. Because different types of political violence have different characteristics, their effects on FDI inflows may differ.

1.1. Attributes of International Production

A multinational enterprise (MNE) organizes production of goods and services in more than one country, involving the transfer of assets or intermediate products within the investing enterprise and without any change in ownership. In this paper, the focus of analysis – FDI inflows – refers to the net inflows of investment to acquire a lasting management interest (10% or more of voting stock) in an enterprise operating in an economy other than that of the investor. Operationally, it is the sum of equity capital, reinvestment of earnings, other long- and short-term capital as shown in the IMF balance of payments statistics.[1]

In the literature on FDI and MNE, several strands of theoretical explanations of why firms engage in international production exist. Some scholars (e.g., Hymer, 1976) view FDI as the result of structural market imperfection and the firm's desire to pursue monopoly status using its firm-specific assets. Other scholars (e.g., Buckley & Casson, 1976; Rugman, 1981) look at FDI as a way to resolve opportunistic behaviors in market transactions, that is, exerting direct hierarchical control over foreign production, instead of servicing the market with other alternative means (such as trade). Still others (e.g., Vernon, 1971) consider FDI as the firm's response to the technological maturity of its products and the growing demand in foreign market. The eclectic paradigm by Dunning (1988, 1993) seeks to tie these explanations into one OLI framework. That is, national firms become transnational to exploit three types of advantages: (1) a firm's advantages due to ownership (O) over tangible and intangible assets, (2) the firm's internalization (I) advantages from its hierarchical control of cross-border production, and (3) the location-specific (L) advantages perceived by firms based on the characteristics of host countries, such as resource endowment or government policies. In other words, a firm carries out FDI when the location and its ownership advantages make production abroad profitable and its direct hierarchical control of the production is preferred over other alternative modes of satisfying the demand for its products (e.g., licensing or trade).

The logic of international production brings to bear two attributes of FDI that are linchpins for my argument. FDI involves cross-border jurisdiction and a long time horizon. I address the role of cross-border jurisdiction in my argument in this subsection and turn to the implication of a long time horizon in the next.

Because FDI is foreign in the host economy, subject to laws and regulations by the host government, inter-jurisdictional issues arise. Cross-border jurisdiction implies that foreign investors operate in an unfamiliar foreign environment. They often are not as well informed and connected as domestic investors about the policy environment; they may be treated differently than domestic investors by the host government. In the unfamiliar territory, foreign investors necessarily care about the expected return to their investments and the ease to exit the host country when the security of their property is threatened. Government policies toward FDI are important for foreign investors, because as part of the L-factors, they influence the expected returns of the investment project and the barrier to exit the host economy. Particularly critical are host policies on expropriation, exchange control, breach of contract, repatriation of profits, voluntary divestment, performance requirement, taxation, etc.[2]

To the extent that political violence influences these government policies, foreign investors will take political violence into account when they make decisions on the investment location and amount. Does political violence influence government policies toward foreign investors? Politicians, who are engaged in financially expensive and politically costly military warfare, often have an incentive to impose capital controls and prevent capital flight. The need to finance expensive wars often requires higher tax rates. Civil wars often result in regime changes that are typically associated with policy changes, such as expropriation of foreign assets and breaching contracts between MNEs and former regimes. The desire to crack down transnational terrorism invariably causes governments to monitor and scrutinize more closely private financial transactions because they may be used to finance terrorist activities.

1.2. Ex ante Effect of Political Violence on Investment

The logic of international production suggests that foreign direct investors typically have a long time horizon when operating in the host country. Their investments cannot be easily reversed without paying some cost. The investment itself becomes a barrier to exit for the MNE (Rivoli & Salorio, 1996). A long time horizon implies that foreign direct investors have to be forward-looking, constantly anticipating ex ante how political violence affects the expected returns of their investments and the political barrier to exit. Forward-looking firms operate based on the expected profit rate and hedge against risks. Ex ante, firms evaluate the probability of political violence and the likelihood of such occurrences inducing unfavorable policy changes. Firms incorporate these evaluations into their choices of investment location and amount.

The implication is that anticipated events of political violence can make an otherwise desirable investment location undesirable, deterring future investment flows, and render an existing investment site less attractive, reducing reinvestment, limiting expansion, and potentially inducing pre-emptive divestment. These changes in investment decisions can occur before the events of political violence materialize. For such cases, the actual happening of political violence ends up having little effect upon FDI inflows ex post.[3]

1.3. Ex post Effect of Political Violence on Investment

MNEs operate in an uncertain investment environment. While certain types of uncertainty are endogenous and can be resolved by investment through experiential learning, the type of uncertainty resulting from political violence-induced policy changes tends to be exogenous to investment (Rivoli & Salorio, 1996). This is consistent with the notion in the international relations literature that the occurrence of military conflict should be treated as a stochastic process, involving incomplete information and the signaling of resolve at the crisis bargaining stage (e.g., Fearon, 1995). Civil wars and terrorist attacks also are events that tend to be exogenous to investors.

Furthermore, investors do not have perfect foresight, cannot fully anticipate occurrences of political violence, and have to adjust to the consequences of unanticipated political violence ex post. Unanticipated occurrences of political violence often lead to unanticipated unfavorable government policy changes (e.g., expropriations), causing the expected returns of an investment project to decline.

As long as firms have no perfect foresight of all political violence-induced risks, their ex ante and ex post risk-adjusted returns will not be identical. The unanticipated developments provide firms with new information regarding possible future government intervention or market disruption, causing a downward revision of the expected stream of revenues. Hence, unanticipated incidents of political violence force investors to moderate their ex ante optimism, such that a country may no longer be chosen as an investment site or the amount of future investment be reduced.

Consider the following thought experiment. An actual event of political violence may be decomposed into a systematic component that investors capture by forecasting based on all available information and a stochastic component driven by the degree of uncertainty. The systematic component measures the accuracy of ex ante expectations while the stochastic component reflects the amount of new information ex post. Depending on the relative size between the systematic and the stochastic components, firms may be surprised more by some events of political violence and less so by others. More unanticipated events cause greater unexpected disruptions and higher expected future risks, generating larger ex post effects.

The theory suggests that the ex ante and ex post effects of political violence on investment flows are inversely related in size. A large anticipated effect is likely to be internalized into investment decision ex ante, such that the actual occurrence of violence brings no surprise, causing little ex post change in investment decision, whereas a small anticipated effect implies a large unanticipated surprise for investors, ending up being associated with a large ex post adjustment in investor behavior. This is relevant to how the effects of political violence on investment should be tested empirically. Using the actual violence occurrence in the statistical model, like it has been done in the literature, one finds only an average of large and small ex post effects. Such averaging, depending on the sample and model specification, may produce inconsistent findings. Accurate empirical tests should distinguish between the unanticipated and anticipated effects. The anticipated events should be uncorrelated with investment behaviors subsequent to actual event occurrence, while the unanticipated events should produce statistically significant negative effects ex post.

1.4. Variations among Different Types of Political Violence

The previous literature on the effect of political risk on FDI typically employs some composite index that lumps a variety of political activities together, ranging from demonstrations and strikes to armed conflicts and terrorist attacks. This practice ignores the disparate attributes of different types of political violence, a likely source of inconsistent findings.

Here I focus on three types of extreme political violence: civil war, interstate war, and transnational terrorist incidents. They usually involve salient issues with high stakes. Politicians often commit tremendous manpower and financial resources to deal with them. They are also less likely to give in or compromise on these issues. As a result, these types of political violence can cause economic recession in a host country, impose financial constraints on the government, and damage the country's infrastructure.

As for their differences, civil wars are fought between factions on the host territory. They often result from various social cleavages (class, ethnic, religious, and/or ideological), and lead to massive migration, destruction of infrastructure, repression, even massive killing, and genocide (e.g., Fearon & Laitin, 2003; Ghobarah, Huth, & Russett, 2003; Li & Wen, 2005). Civil wars are often associated with regime changes and policy swings. All these have negative implications for foreign direct investors operating in the country.

Interstate wars, on the other hand, are fought between countries or their alliances. Enduring large-scale wars obviously has detrimental effects on the economic prospect of a host country. But such wars tend to be rare. In addition, since many interstate wars involve territorial claims, they may be limited to the border areas and sometimes, may not even be fought on one's own territory. The current U.S. war against Iraq, for example, was fought on Iraqi territory, the effect of which may be large and negative on investment flows to Iraq but not necessarily so for investment flows to the U.S. Finally, while interstate wars are likely to disrupt investment flows between belligerent countries, the disrupted flows may be substituted by those from one's own allies. Therefore, while investors certainly want to evade a country involved in an interstate war that is being fought on its own territory, the overall effect of an interstate war on investment may be an empirical issue and is likely to be smaller than that of the civil war.

Transnational terrorist incidents are different from both interstate and intra-state wars. Terrorism is often defined as the premeditated or threatened use of extra-normal violence or force to obtain a political, religious, or ideological objective through the intimidation of a large audience (e.g., Enders & Sandler, 1999, 2002). These include a variety of activities, ranging from assassination, and hijacking, to suicide bombing. To the extent that these activities spread and threaten the host economic conditions and the security of the investor's asset, they should have a dampening effect on investment flows. But less significant and limited terrorist attacks may have little effect on the expected returns of an investment project.

2. RESEARCH DESIGN

2.1. Modeling FDI Inflows

The typical dependent variable in the studies of the determinants of FDI inflows at the national level is the level of FDI net inflows into a country.[4] Conceptually the variable can be considered as consisting of two distinct but related components (e.g., Woodward & Rolfe, 1993; Globerman & Shapiro, 2003). One is the presence or absence of any FDI inflow in a country, which largely reflects the location choice by investors. The other is the amount of positive FDI inflow into a country. One can only observe a positive amount of FDI inflow when the country is chosen as an investment location by enough investors to counteract the divestment flow out of the country. Since events of political violence may affect the location choice and the investment amount differently, one may model the effects on the two variables separately by using the Heckman selection model (Heckman, 1979; Greene, 2003). The model can be specified as follows:

Equation of FDI inflow presence:

$$z^*_{i(t+1)} = \gamma_0 + \gamma_k \text{Violence}_{it} + \gamma_1 \text{Control}_{it} + u_{1i(t+1)}$$

where $z^*_{i(t+1)}$is the probability of observing any positive FDI inflow into country i in year $(t+1)$, Violence_{it} and Control_{it} represent vectors of political violence-related variables and the control variables, γ_k and γ_l their corresponding vectors of coefficients.

Equation of FDI amount:

$$\text{FDI Inflow}_{i(t+1)} = \beta_k \text{Violence}_{it} + \beta_m x_{it} + u_{2i(t+1)}, \quad \text{observed only if } z^*_{i(t+1)} > 0$$
$$u_{1i(t+1)} \sim N(0,1),\ u_{2i(t+1)} \sim N(0,\sigma),\ \text{corr}(u_{1i(t+1)}, u_{2i(t+1)}) = \rho$$

where FDI $\text{inflow}_{i(t+1)}$ is the positive amount of FDI inflow into country i in year t+1, x_{it} the vector of economic control variables affecting the amount of FDI inflow. As in Globerman and Shapiro (2003), the variable is log transformed to correct its skewed distribution. FDI inflow into country i in year t+1 is present only when the selection variable $z^*_{i(t+1)} > 0$ and the inflow is zero or negative otherwise. A zero or negative value for the variable indicates either that no investor chooses to invest in that country in the year, or that the new investment plus reinvestment equals to or is smaller than the divestment; either of the two scenarios demonstrates the lack of attractiveness of the country as an investment location. Both the probability of observing positive FDI inflow $z^*_{i(t+1)}$ and the amount of FDI inflow are a function of various forms of political violence associated with the country. The dependent variables in both equations are one year leading variables to control for possible reverse causality.

As denoted, the model assumes that the error terms from both equations are normally distributed, with zero means and correlation ρ. Where $\rho \neq 0$, the two equations are not independent from each other. The selection model as a whole takes into account the cross-equation correlation and allows us to estimate the effects of political violence on the presence of FDI inflow and the amount, separately.

The empirical analysis covers about 129 countries from 1976 to 1996. The pooled time-series cross-sectional (TSCS) design and wide temporal and spatial variations in the level of FDI inflows enable a discriminating statistical assessment of the effect of political violence. I use the one-tailed t-test for hypothesis testing because my hypotheses are directional.

Statistical models for pooled TSCS data may exhibit heteroskedasticity and serial correlation. While these problems do not bias the estimated coefficients, they often cause biased standard errors for the coefficients, producing invalid statistical inferences. To deal with these potential problems, I estimate the Huber–White robust standard errors clustered over countries. These estimated standard errors are robust to both heteroskedasticity and to a general type of serial correlation within the cross-sectional unit (Rogers, 1993; Williams, 2000).

2.2. Key Independent Variables

Several groups of political violence-related variables are designed to test the above hypotheses. First, I construct three variables that measure a country's involvement in the civil war, the interstate war, and the number of transnational terrorist incidents. They provide an initial test of the effect of political violence without distinguishing the anticipated and unanticipated effects of political violence. More specifically, civil war is a dummy variable coded 1 if a country is involved in a civil war in year t and zero otherwise. The definition and data on this variable is from Fearon and Laitin (2003).

Interstate war also is a dummy coded 1 if a country is involved in an interstate conflict with more than 1,000 battle deaths in year t and zero otherwise. The data come from the Armed Conflict Database from 1946 to 2000 by Gleditsch, Wallensteen, Eriksson, Sollenberg, and Strand (2002).[5] Terrorist incidents are measured by the number of transnational terrorist events that occur in a country in year t. Data are collected from the International Terrorism: Attributes of Terrorist Events (ITERATE) data sets (Mickolus, 1982; Mickolus, Sandler, Murdock, & Fleming, 1989, 1993, 2002). Since these variables do not distinguish the ex ante and ex post effects of political violence, I do not have clear expectations of their effects on FDI inflows. If anything, one should expect the results to be mixed.

Simulating how investors use available information to predict future occurrences of political violence, I construct forecasting models of civil war involvement, interstate war involvement and transnational terrorist incidents in year t, based on available information on the predictors from year (t–1). I use a civil war involvement model to identify anticipated and unanticipated civil wars. Fearon and Laitin (2003) estimate the effect on civil war onset of a number of covariates, including gross domestic product (GDP) per capita, population size, size of mountainous terrain, oil producing country, new state, non-contiguous state, political instability, political regime type, ethnic fractionalization, and religious fractionalization. I use their model to generate the predicted probability of civil war involvement of a country in year t. Instead of civil war onset, I use civil war involvement of a country as the dependent variable and estimate a logit model. I also include the number of years a country had been involved in any civil war till the previous year to increase the accuracy of the model forecast. Anticipated civil war is a dummy variable coded 1 if the predicted probability of civil war involvement is greater than 0.5 and the country is involved in a civil war in year t, and zero otherwise. I capture the unanticipated civil war using a truncated continuous measure, which equals [actual civil war involvement dummy in year t^* (1 – predicted probability of civil war involvement)]. The variable is superior to a dichotomous measure of unexpected civil war involvement because it contains information on the degree of surprise a civil war occurrence brings to investors.

I estimate a country level model of an interstate war involvement to identify anticipated and unanticipated interstate war involvement by a country. The logit model of an interstate war involvement includes the following covariates: the major power status of a country, GDP per capita, country size, the number of years a country was involved in an interstate war, the change in urbanization (the annual growth rate of the urban population), status of interstate war involvement in the previous year, political regime type, and peace duration variables (Beck, Katz, & Tucker, 1998). Predicted probability of an interstate war involvement is generated. Anticipated interstate war is coded 1 if a country is involved in an interstate war in year t and the predicted probability is greater than 0.3, and zero otherwise. Unanticipated interstate war is a continuous measure that equals [actual interstate war involvement dummy in year t^{*} (1 – predicted probability of interstate war involvement)]. It is worth noting that interstate wars are fought between countries. A forecasting model of interstate war involvement based on country attributes is apparently insufficient. The model has poor predictive power, where the predicted probability for actual war involvement cases ranges between 0.004 and 0.55, with 0.3 around the 90th percentile. But the country level analysis of FDI inflows in this paper prevents the use of a dyadic model of interstate war involvement that is typical in the international relations literature. Despite the weakness, the country level model of interstate war involvement still produces useful information about the continuation of interstate war involvement by including several past conflict history variables in the model. Future research may usefully extend the analysis to bilateral investment flows.

To measure anticipated and unanticipated terrorist incidents in a country, I estimate a negative binomial model of transnational terrorist incidents based on the data and model in Li and Schaub (2004). Li and Schaub (2004) estimate how economic globalization affects terrorist incidents using a negative binomial model and the ITERATE data on terrorist incidents. The dependent variable is an event count of the number of transnational terrorist incidents in countries. Their model includes GDP per capita, major trading partners' GDP per capita, trade openness, FDI inflows, portfolio investment, country size, government capability, number of incidents in the previous year, interstate conflict, regional dummies, Cold War dummy, and the level of democracy. Because trade openness, FDI inflows, and portfolio investment variables have a lot of missing values, I omit them from the model, but add additional transnational terrorist hot spot variables (Li & Braithwaite, 2005) that help to improve the accuracy of model forecast. The anticipated terrorist incidents variable is a truncated continuous measure, which equals the difference between the predicted event count and the actual count in year t if their difference is equal to or less than three (the estimation sample average number of incidents), and zero otherwise. The unanticipated incidents variable equals the difference between the predicted event count and the actual event count in year t if their difference is greater than three incidents, and zero otherwise. The unanticipated variable should capture those cases where events are most unanticipated.

What are the expected signs for these political violence-related variables? Based on my theoretical argument, the actual act of violence (civil war, interstate war, terrorism) that is anticipated to occur in year t, based on information available at the end of year $(t-1)$, does not affect the investment flows that occur in year $(t+1)$. Investors have adjusted their investment decisions before the occurrence of the anticipated violence. As a result, the realization of the anticipated event in year t has little effect on subsequent investment behaviors in year $t+1$. The coefficients for the anticipated violence variables are expected to be statistically insignificant for both the inflow presence equation and the inflow amount equation. Because the hypothesized effects are not directional, two-tailed tests are applied in hypothesis testing.

In contrast, where investors err on the side of optimism, they are taken by surprise by the occurrences of political violence. Actual civil wars, interstate wars, and terrorist attacks that are unanticipated to occur in year t may affect investors' expected returns and their ease to exit in the next period. Where the effect is strong enough to induce changes in investment behaviors, they are reflected in the decisions to invest elsewhere, to divest from a country, or reduce the amount of planned investment. Therefore, the coefficients for the unanticipated violence variables are expected to be statistically significant and negative for both the inflow presence equation and the inflow amount equations. As these hypothesized effects are directional, I apply one-tailed test for hypothesis testing.

2.3. Control Variables

The set of control variables is different between the inflow presence equation and the inflow amount equation, which helps to identify the model based on different information sets, rather than relying on the functional form (as in the case of using identical model specification for both equations). The control variables for the investment presence equation include the investment inflow in year t and the Cold War dummy. Since an investment inflow consists of new investment and reinvestment and firms tend to have a long time horizon, the investment inflow should exhibit inertia. In addition, the investment inflow in the current year should be the best predictor of investment decisions for the next period, because the investment inflow in the current year results from best information available to the investor. The Cold War dummy is coded 1 for a country in years before 1990 and zero otherwise. The Cold War politics has seriously inhibited capital flows between countries associated with the two superpowers, respectively. The end of the Cold War brought about many new attractive investment destinations in Eastern Europe and Asia for Western investors.

The control variables for the inflow amount equation include the usual suspects in the empirical literature on FDI inflows, including the market size, economic development, growth rate, exchange rate stability, as well as inflows in year *t*. Large markets are more likely to attract FDI due to an expected stream of future returns while small market size attracts less FDI. Studies of FDI inflows (e.g., Chan & Mason, 1992; Jun & Singh, 1996) typically control for market size. I use logged GDP in purchasing power parity (PPP) to measure market size. Data for all these control variables are from the World Bank's (1999) *World Development Indicators.*

Economic development should affect FDI inflows positively. More developed countries often attract more FDI than less developed ones, due to differences in consumer purchasing power, capital endowment, and infrastructure. The variable is measured as GDP per capita based on PPP, logged to deal with its skewed distribution.

Economic growth is often found to induce more FDI inflows to a country (e.g., Gastanaga, Nugent, & Pashamova, 1998; Jun & Singh, 1996; Schneider & Frey, 1985). Profit-maximizing foreign investors are attracted to fast-growing economies to take advantage of future market opportunities. It is the annual percentage growth rate of GDP at market prices based on constant local currency.

Exchange rate risk may also affect FDI inflows. Large movements in the exchange rate inhibit long-term planning and disrupt local markets. To measure such risk, I use the absolute value of the percentage change of the official exchange rate of local currency units per U.S. dollar.

3. FINDINGS AND IMPLICATIONS

Table 1 presents the results of the effects of civil war, interstate war, and terrorist incidents, without separating the ex ante and ex post effects. The top panel of the table contains results for the inflow presence equation, while the bottom panel contains the results for the inflow amount equation. Each panel has four model specifications. Model 1 is the benchmark model, Model 2 includes only civil war among the violence-related variables, Model 3 only interstate war, and Model 4 only terrorist incidents. Model 5 evaluates whether the results in Model 1 are sensitive to alternative specification, by including identical sets of variables in the two equations.

Table 1. Effect of Political Violence on FDI Inflows, 1976–1996.

	Model 1	Model 2	Model 3	Model 4	Model 5
Inflow Presence Equation					
Civil war	−0.1659	−0.1499			−0.1010
	(0.1200)	(0.1178)			(0.1463)
Interstate war	−0.4154**		−0.4081*		−0.4683*
	(0.1611)		(0.1720)		(0.2325)
Terrorist incidents	0.0063			0.0040	0.0085
	(0.0040)			(0.0039)	(0.0085)
Previous inflows	0.9147**	0.9379**	0.5819**	0.6129**	0.7183**
	(0.2461)	(0.2510)	(0.2102)	(0.2168)	(0.2124)
Cold war dummy	−0.3520**	−0.3388**	−0.3452**	−0.3869**	
	(0.0811)	(0.0776)	(0.0746)	(0.0723)	
Market size					0.0065
					(0.0507)
Development					−0.0402
					(0.0752)
Growth					0.0063
					(0.0058)
Exchange rate instability					−0.00001**
					(0.000003)
Constant	0.6002**	0.5796**	0.5957**	0.5452**	0.8478
	(0.0780)	(0.0762)	(0.0736)	(0.0693)	(0.9114)
ϱ	−0.91	−0.91	−0.92	−0.92	−0.92
Wald ($\varrho = 0$)	110.01	115.96	148.53	169.37	106
Total N	2682	2705	2918	3144	2289
Inflow Amount Equation					
Civil war	−0.1647^{+}	−0.1616			−0.2100
	(0.2206)	(0.2201)			(0.2214)
Interstate war	0.1317		0.0738		0.1355
	(0.2081)		(0.2343)		(0.2129)
Terrorist incidents	0.0003^{+}			−0.0035	−0.0007
	(0.0061)			(0.0051)	(0.0066)
Previous inflows	0.0612*	0.0604*	0.0579*	0.0600*	0.0636*
	(0.0258)	(0.0256)	(0.0255)	(0.0254)	(0.0291)
Market size	0.5524**	0.5569**	0.6059**	0.5775**	0.5797**
	(0.0709)	(0.0678)	(0.0571)	(0.0464)	(0.0796)
Development	0.6291**	0.6249**	0.5653**	0.5807**	0.6899**
	(0.1189)	(0.1169)	(0.1045)	(0.0996)	(0.1247)
Growth	0.0317**	0.0315**	0.0323**	0.0314**	0.0222*
	(0.0085)	(0.0084)	(0.0084)	(0.0081)	(0.0096)
Exchange rate instability	−0.0001**	−0.0001**	−0.0001**	−0.0001**	−0.0001**
	(0.00002)	(0.00002)	(0.00002)	(0.00002)	(0.00002)
Constant	−20.0624**	−20.1179**	−20.8356**	−20.2065**	−21.3807**
	(1.2738)	(1.2144)	(1.1404)	(0.9734)	(1.4090)

Table 1. *(Continued)*

	Model 1	Model 2	Model 3	Model 4	Model 5
N	1912	1923	2051	2126	1912
Model Wald test	442.74	417.69	460.48	585.31	489

Note: Robust standard errors in parentheses.
*Significant at 5%.
**Significant at 1%.
+Significant at 10%.

Table 2 presents the results for anticipated and unanticipated political violence variables. Like Table 1, Table 2 also contains two panels, corresponding to the inflow presence equation and the inflow amount equation. Model 1 is the benchmark model, Model 2 contains only the unanticipated political violence-related variables and excludes the anticipated variables, Model 3 reverses Model 2 specification, and Model 4, like Model 5 in Table 1, evaluates whether allowing the same specification for the two equations affects the robustness of the results in Model 1.

Across all models in both tables, the hypothesis that the cross-equation correlation equals zero is rejected at the 1% level. The cross-equation correlation is about −0.9, far different from zero correlation. The use of the Heckman selection model is appropriate. The negative correlation indicates the presence of unobservable characteristics that increase the probability of a country receiving FDI but reduce the amount of FDI it receives. Across all models in both tables, the Cold War dummy is consistently significant and negative for the inflow presence equation. On an average, a country is less likely to be chosen as an investment location during the Cold War years than after the end of it. The FDI inflow in year t is a statistically significant and positive predicator of the presence of FDI inflow across all models in both tables. In Model 5 of Table 1 and Model 4 of Table 2, where the inflow presence equation is specified the same as the inflow amount equation, the previous inflows' variable remains significant and positive, but the other control variables (market size, development, growth) that are typically found to be important determinants of FDI flows in the literature fail to achieve statistical significance, except for exchange rate instability. These two models do not appear to be superior to the benchmark model in both tables, which gives us more confidence in the benchmark model results.

The control variables for the FDI amount equation produce results that are quite consistent with the conventional wisdom in the literature. Even

Table 2. Anticipated and Unanticipated Effects of Political Violence on FDI Inflows, 1976–1996.

	Model 1	Model 2	Model 3	Model 4
Inflow Presence Equation				
Unanticipated civil war	-0.3765^{+}	-0.3794^{+}		-0.3604^{+}
	(0.2374)	(0.2334)		(0.2530)
Anticipated civil war	0.0855		0.0567	0.0196
	(0.1961)		(0.1894)	(0.2062)
Unanticipated interstate war	-0.5589^{**}	-0.6119^{**}		-0.5391^{*}
	(0.2395)	(0.2569)		(0.2452)
Anticipated interstate war	−0.2716		-0.9129^{**}	−0.4107
	(0.2910)		(0.3013)	(0.2853)
Unanticipated terrorist incidents	0.0160	0.0196		0.0146
	(0.0147)	(0.0168)		(0.0174)
Anticipated terrorist incidents	0.0134		0.0193	0.0268
	(0.0332)		(0.0313)	(0.0333)
Previous inflows	0.7075^{**}	0.7122^{**}	0.7422^{**}	0.6910^{**}
	(0.2020)	(0.2047)	(0.2045)	(0.2108)
Cold war dummy	-0.1814^{*}	-0.1939^{*}	-0.1547^{+}	
	(0.0919)	(0.0928)	(0.0906)	
Market size				0.0234
				(0.0488)
Development				−0.0525
				(0.0778)
Growth				0.0057
				(0.0064)
Exchange rate instability				$-9.02e{-}06^{**}$
				(3.76e–06)
Constant	0.7971^{**}	0.8057^{**}	0.7489^{**}	0.5776
	(0.0901)	(0.0928)	(0.0852)	(0.8829)
ϱ	−0.91	−0.91	−0.91	−0.92
Wald ($\varrho = 0$)	107.70	108.99	115.31	86.05
Total N	2183	2183	2183	2143
Inflow Amount Equation				
Unanticipated civil war	-0.7078^{*}	-0.7131^{*}		-0.7285^{*}
	(0.3235)	(0.3249)		(0.3214)
Anticipated civil war	−0.0002		−0.0125	0.0705
	(0.2714)		(0.2754)	(0.2713)
Unanticipated interstate war	0.0804	0.0578		0.1171
	(0.2521)	(0.2582)		(0.2526)
Anticipated interstate war	−0.7628		−0.8863	−0.7914
	(0.7510)		(0.5910)	(0.7176)
Unanticipated terrorist incidents	0.0005	0.0011		0.0004
	(0.0064)	(0.0062)		(0.0062)
Anticipated terrorist incidents	0.0041		−0.0004	0.0003
	(0.0306)		(0.0309)	(0.0290)

Table 2. (*Continued*)

	Model 1	Model 2	Model 3	Model 4
Previous inflows	0.0614*	0.0619*	0.0612*	0.0608*
	(0.0277)	(0.0277)	(0.0272)	(0.0280)
Market size	0.5860**	0.5825**	0.5704**	0.5749**
	(0.0763)	(0.0706)	(0.0761)	(0.0812)
Development	0.6742**	0.6718**	0.7141**	0.7192**
	(0.1315)	(0.1237)	(0.1293)	(0.1321)
Growth	0.0283**	0.0285**	0.0318**	0.0211*
	(0.0093)	(0.0093)	(0.0093)	(0.0104)
Exchange rate instability	−0.0001**	−0.0001**	−0.0001**	−0.0001**
	(0.00002)	(0.00002)	(0.00002)	(0.00002)
Constant	−21.3973**	−21.2980**	−21.3866**	−21.4993**
	(1.3499)	(1.3112)	(1.3244)	(1.4353)
N	1790	1790	1790	1790

Note: Robust standard errors in parentheses.
*Significant at 5%.
**Significant at 1%.
+Significant at 10%.

when we include the rather restrictive control variable, the previous inflows, the effects of the other control variables are highly significant and in the expected directions. Large market size, higher development, and faster economic growth all increase the amount of FDI inflows into a host country, while exchange rate instability reduces the amount of inflows. The results for these control variables are consistent across all models in both tables, giving us more confidence in the model results.

Next we turn to discuss the results for the political violence-related variables. We start with the results in Table 1. The statistical findings are quite mixed, which is not surprising given that each of these variables lumps the anticipated and unanticipated effects together. More specifically, civil war involvement does not influence the investment location choice across all five models, but it has a weakly significant negative effect on the investment amount in the host country in Model 1 only. In contrast, an interstate war involvement is highly significant and negative in the inflow presence equation. A country that is involved in an interstate war is less likely to be chosen as an investment destination. But an interstate war involvement does not reduce the amount of investment the country receives once it is chosen favorably. The number of transnational terrorist incidents in a country does not affect its chances of being chosen as an investment destination or the amount it receives once being chosen. The only exception is in Model 1, where the number of terrorist incidents appears to weakly increase the amount of FDI investment a country receives. The mixed nature of these results reflects the situation of the collective evidence in the literature to date.

Are the results for the political violence-related variables in Table 2 consistent with our theoretical expectations? Do they exhibit any coherent pattern that has been absent in the literature on the effect of political risk over FDI flows? Starting with the effects of civil war variables, we find that as expected, the effect of an unanticipated civil war involvement is statistically significant and negative across all relevant models in both equations; the effect of an anticipated civil war involvement is statistically insignificant across all relevant models in both equations, also as expected. A country that experiences a civil war that investors fail to anticipate will find itself being shunned by investors both in terms of its chances of being chosen as an investment location and the amount of FDI it receives. The coefficient estimate for the variable demonstrates that as the probability that a country experiences an unanticipated civil war rises from 0 to 1, the decline in its FDI inflow ranges from 70 (Model 1) to 74% (Model 4). This is an economically substantial change. However, the occurrence of a civil war that has been anticipated by investors will no longer influence subsequence investment behaviors, which is consistent with the notion that the repressive effect has kicked in before the anticipated civil war occurs.

The results for the interstate war variables also are largely consistent with our expectations. As expected, the anticipated interstate war does not affect the chance that a country is selected as an investment destination across all models, except in Model 3. This is not surprising, because Model 3 excludes the unanticipated interstate war variable. The anticipated interstate war, being constructed based on a model of poor predicted power and low probability cut off, is likely to contain cases that are unanticipated. Finally, as expected, the anticipated interstate war does not have any effect on the amount of FDI inflows a country receives across all models for the inflow amount equation.

Interestingly, the unanticipated interstate war reduces the chance that a country is being chosen as an investment location, based on all models of the inflow presence equation, but it has no statistically significant effect on the amount of FDI a country receives across all models of the inflow amount equation. The findings are not inconsistent with our understanding of the nature of interstate wars. The results suggest that interstate war largely deters new equity investment that flows into a country. The deterred new investment may have originated from the belligerent country, or from those investors that were contemplating to enter the market but are now put on hold, given the increased uncertainty about the future direction of the host country. However, pre-existing investment in the host country does not necessarily shrink or withdraw and may even expand through an increased reinvestment. This will occur so long as the war is limited to the border area or fought on the soil of another country, without generating any real drastic policy changes of wide impact. In addition, the war effort itself may generate some perverse incentive for pre-existing MNEs to expand their operations, due to the increased war-related demand for the products of the MNEs, especially those in the agriculture, extractive, chemical, and manufacturing industries. Finally, as noted, the market demand which the deterred new investment was intended to serve may now be satisfied by existing MNEs in the country through expanding their operations.

As expected, the anticipated transnational terrorist incidents do not produce any statistically significant effect on the chance that a country is chosen as an investment location or the amount of FDI it receives. The statistical finding with respect to the unanticipated terrorist incidents is not as expected. Contrary to our expectation, the unanticipated terrorist incidents, despite their unexpectedness, do not generate any changes in investor behaviors, either in terms of the investment location choice or the decision over investment amount. One interpretation that is consistent with the findings is that investors do not care about or cannot deal with terrorist incidents-related risks at all. This interpretation, however, is not plausible in light of the catastrophic consequences of events like the 9/11. Another possibility is that the measure of terrorist incidents that are used to generate these anticipated and unanticipated measures is too crude by aggregating all types of incidents together. It fails to separate terrorist attacks that have real implications for business operations from those that are merely news of little informational value (e.g., hoax). Future research may further explore the issue by creating a measure of terrorist attacks similar in severity to those measures of interstate and intra-state wars. A third possibility is due to the particularistic attributes of FDI, relative to the flow of goods, for example. In Chapter 10 of this volume, Fratianni and Kang show that terrorism reduces real bilateral trade flows by raising trading costs and hardening borders. While traders are sensitive to and constantly internalize the changes in trading costs due to terrorist incidents, FDI tends to be much more rigid and stationary in the host economy. As noted, foreign direct investors who operate production facilities in the host economy tend to have long time horizons and global business strategies. They are unlikely to respond to every kind of terrorist threat, because not every type of terrorist incidents has material influence over the firm operation and profit. A fourth possibility that may account for the insignificant effect of unanticipated terrorist attacks relates to the nature of the FDI data we use. In analyzing the effect of terrorism on trade, for example, Fratianni and Kang examine bilateral trade data and they find that countries sharing a common land border and suffering from terrorism trade less than neighboring countries that do not experience terrorism. But the impact of terrorism on bilateral trade declines as distance between trading partners increases. The FDI flows are also directional. The effect identified by Fratianni and Kang in terms of trade may also apply to FDI flows. Hence, the use of monadic FDI data makes it difficult for us to identify accurately the effect of political violence, including not just terrorism but also interstate and civil war.

4. CONCLUSION

The international business literature presents an interesting intellectual puzzle regarding the effect of political instability and political risk on FDI. Survey evidence shows that multinational executives take into account political instability in making investment decisions, while econometric studies produce conflicting findings. In this paper, I offer a new theory that explains how political violence, an extreme form of political instability, affects FDI.

The new theory contributes to the literature by bringing in rational expectations and uncertainty on the part of foreign investors to shed light on the effect of political violence on investment behaviors. The amount of FDI is analyzed separately from the probability of a country receiving FDI. The empirical analysis of FDI inflows covers about 129 countries from 1976 to 1996. Unanticipated civil war has a negative ex post effect on investment choices over location and magnitude, but anticipated civil war does not. Unanticipated interstate war decreases the chance of a country chosen as an investment location, but not the size of investment. Anticipated interstate war does not influence ex post investor choices over either location or magnitude. Likewise, anticipated terrorist attacks do not have such ex post effects. But unanticipated terrorist attacks are not found to have any effect on investment choices either, an issue worth further exploration. Overall, the statistical findings largely support my theoretical expectations. The theory helps reconcile the inconsistent econometric findings on the effect of political instability on FDI flows.

However, future research should further investigate the unexpected finding that unanticipated terrorist attacks do not influence investment behaviors. Disaggregating the types of terrorist attacks is a meaningful next step. Where data are available, one should also look into bilateral investment flows, rather than replying on country level investment data. This may also account for why interstate conflict does not influence country level FDI inflows.

Despite these issues, this article suggests a new perspective that proves useful in reconciling contradictory findings in the international business literature. Analysts are urged to consider issues of rational expectation, uncertainty, as well as attributes of political events, in order to understand how politics influences investment behaviors. Political violence affects investment in a complex manner. More sophisticated understanding leads to better appreciation of the negative consequences of political violence, providing a greater incentive to search for policy solutions that reduce violent acts.

NOTES

1. Most countries fail to report data on reinvested earnings, hence resulting in a downward bias in the reported size of the flows. I thank Alan Rugman for bringing this data issue to my attention. To the extent that political violence is expected to reduce reinvestment, the lack of data on reinvestment makes it harder for us to find a statistically significant effect of violence on FDI.

2. One may argue that an MNE may not necessarily care too much about the risks of a particular investment asset, since the firm can diversify away some of the risks by holding a market portfolio (Butler & Joaquin, 1998, p. 600). For specific investment asset in a particular country, at least part of the political risks resulting from political violence-related policy changes are not diversifiable risks. This is because investors cannot fully anticipate all contingencies and because the market for the securitization of political risks is not yet well developed (Finnerty, 2001).

3. Li and Sacko (2002) offer a similar line of argument on the effect of interstate conflict on bilateral trade. But FDI has its own unique attributes and causal mechanisms. Furthermore, this analysis considers civil war and terrorism in addition to interstate war.

4. Data on the variable are from the *World Development Indicators*. The ratio of FDI/GDP also is often used in empirical studies. The conceptual problem with the ratio measure is that both FDI and GDP are on the left-hand side, both affected by the same factors. Consequently, it is difficult to interpret whether the coefficient of a right-hand side variable reflects its effect on FDI or GDP. In addition, the level variable and the ratio variable have distinct conceptual implications.

5. In the database, an armed conflict is defined as "a contested incompatibility that concerns government and/or territory where the use of armed force between two parties, of which at least one is the government of a state, results in at least 25 battle-related deaths."

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CHAPTER 12

TECHNICAL APPENDIX ON THE REGIONAL ECONOMIC INTEGRATION DATABASE

Chang Hoon Oh

ABSTRACT

The purpose of this appendix is to provide documentation of the data sources and methodology underlying the empirical tests done in Chapters 2, 5, 6, 8, and 10 of the volume; the actual databases can be downloaded from the homepage of the Indiana University Center for International Business Education and Research (http://www.kelley.indiana.edu/GPO/research.cfm). The databases for multinational enterprises used in Chapters 7 and 9 are described in Chapter 9 and are not covered in this appendix.

The gravity equation applied to international trade uses, among the explanatory variables, basic factors, such as income and distance, and other factors, such as cultural and institutional variables. The basic factors are treated in the first section and other factors in the second.

1. TRADE DATASETS AND GRAVITY EQUATION

This volume applies two widely used datasets on cross-border trade flows: one compiled by Andrew Rose (2005), and available at http://www.faculty.haas.berkeley.edu/arose/, and the other by Robert Feenstra (World

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Trade Analyzer (2004) edited by Canada Statistics). The original sources of the two databases are the International Monetary Fund and the United Nations, respectively.

Discrepancies between the data reported by Rose and by Feenstra for the G7 countries were checked for the years 1980, 1985, 1990, and 1995. The

Table 1. List of Countries used in the Gravity Equation.

North America
- Bermuda[cd]
- Canada
- Mexico[a]
- USA

Central America and Caribbean
- Bahamas[ad]
- Barbados[acd]
- Belize[acd]
- Costa Rica[a]
- Dominican Republic[ad]
- El Salvador[ad]
- Guatemala[ad]
- Guyana[ad]
- Haiti[ad]
- Honduras[ad]
- Jamaica[a]
- Nicaragua[ad]
- Panama[ad]
- St Kitts and Nevis[acd]
- Suriname[ad]
- Trinidad and Tobago[ad]

South America
- Argentina[a]
- Bolivia[ad]
- Brazil[a]
- Chile[a]
- Colombia[a]
- Ecuador[a]
- Paraguay[a]
- Peru[a]
- Uruguay[a]
- Venezuela[a]

Sub-Saharan Africa
- Angola[ad]
- Benin[acd]
- Burkina Faso[ad]
- Burundi[acd]
- Cameroon[ad]
- Central African Republic[acd]
- Chad[acd]
- Comoros[acd]
- Congo[ad]
- Congo, Democratic Republic[ad]
- Djibouti[acd]
- Equatorial Guinea[acd]
- Ethiopia[ad]
- Gabon[ad]
- Gambia[ad]
- Ghana[ad]
- Guinea[ad]
- Guinea-Bissau[ad]
- Kenya[ad]
- Liberia[ad]
- Madagascar[ad]
- Malawi[ad]
- Mali[ad]
- Mauritania[acd]
- Mauritius[acd]
- Mozambique[ad]
- Niger[ad]
- Nigeria[a]
- Rwanda[acd]
- Senegal[ad]
- Seychelles[acd]
- Sierra Leone[ad]
- South Africa[a]
- Sudan[a]
- Tanzania[ad]
- Togo[ad]
- Uganda[ad]
- Zambia[ad]
- Zimbabwe[a]

Middle East and North Africa
- Algeria[ad]
- Bahrain[d]
- Cyprus[d]
- Egypt[a]
- Iran[ad]
- Israel
- Jordan[ad]
- Kuwait[d]
- Libya[d]
- Morocco[ad]
- Oman[ad]
- Qatar[db]
- Saudi Arabia[d]
- Syria[ad]
- Tunisia[ad]
- Turkey[a]
- United Arab Emirates[d]

Australia and Pacific Islands
- Australia
- Fiji[acd]
- Kiribati[acd]
- New Zealand
- Papua New Guinea[ad]
- Solomon Islands[acd]

South East Asia
- Indonesia[a]
- Laos[acd]
- Malaysia[a]
- Philippines[a]
- Singapore
- Thailand[a]
- Vietnam[ad]
- Bangladesh[a]
- Bhutan[acd]
- India[a]
- Maldives[acd]
- Nepal[acd]
- Pakistan[a]
- Sri Lanka[a]

Eastern Asia
- China[a]
- Hong Kong
- Japan
- Korea Republic
- Mongolia[ad]

Western Europe
- Austria
- Belgium-Luxemburg
- Denmark
- Finland
- France
- Germany
- Greece
- Iceland
- Ireland
- Italy
- Malta[d]
- The Netherlands
- Norway
- Portugal
- Spain
- Sweden
- Switzerland
- UK

Eastern Europe
- Albania[ad]
- Bulgaria[ad]
- Former USSR[ad]
- Hungary[ad]
- Poland[ad]
- Romania[ad]

Only for Chapters 2, 5, 9, and 10	*Only for Chapters 2, 9, and 10*	*Only for Chapters 5 and 6*
Former Yugoslavia[acd]	Cambodia[cd]	Cuba[a]
Former Czechoslovakia[acd]	Cote D'ivoire[d]	Netherlands Antilles
	Iraq[d]	Lebanon[a]
	Reunion[cd]	Ivory Coast[a]
	Somalia[d]	New Caledonia
	Yemen[d]	Taiwan
		Brunei
		Myanmar[a]

Note: Unless indicated otherwise, the above list was used in Chapters 2, 5, 6, 8, and 10.Notes for Chapters 5 and 6: [a]indicates developing nations as identified in the Global Development Indicators of the World Bank. The denominations 'Former' USSR, Czechoslovakia, and Yugoslavia group the current nations that constituted those entities. Trade for Former Czechoslovakia and Yugoslavia republics for 1999–2001 are not available, so those nations were dropped for the study of Chapter 6. Notes for Chapter 10: [bcd]indicate countries that do not exist in the EM-DAT (disaster), ICRG (institutional quality), and financial crisis datasets, respectively. Information on Chapters 5 and 6 was obtained from an earlier version of Agudelo and Davidson's Chapter 5.

average discrepancy between the two trade datasets is 3.17% of Feenstra's data, with Feenstra's bilateral trade flows typically larger than Rose's. The largest discrepancy occurs between the UK and the other G7 countries (5.94%). When the UK is excluded, the average discrepancy falls to 2.56%. Table 1 shows a list of countries and identifies what countries were used in the empirical work of individual chapters: the general coverage consists of 135 countries, but 16 countries were added for specific purposes. The biggest difference between the two datasets is in the level of aggregation. Rose uses bilateral trade flows calculated as a simple average of exports from *i* to *j*, imports of *i* from *j*, and corresponding flows for the other trading partner. Feenstra, instead, has a single value of bilateral import flow at the 4-digit level of SITC (Standard International Trade Classifications) and 34 of BEA (Bureau of Economic Analysis) classifications[1]; see Table 2.

Rose's trade dataset is employed in Chapters 2, 8, and 10 and Feenstra's in Chapters 5 and 6. This volume makes two data contributions. The first is to extend the Rose dataset up to 2001 and the second is to merge the Rose and Feenstra datasets, with the result of adding approximately 2,000 new trade-pair observations after 1999.

Rose also supplies data on many determinants of the gravity equation. The economic determinants of the trade gravity equation are real gross domestic product (GDP) and real GDP per capita. Real GDP and real GDP per capita are the products of the two countries' GDP and GDP per capita.

Table 2. BEA Industry Classifications.

BEA Code	Description
1	Grain, mill, and bakery products
2	Beverages
3	Tobacco products
4	Other food and kindred products
5	Apparel and other textile products
6	Leather and leather products
7	Pulp, paper, and board mills
8	Other paper and allied products
9	Printing and publishing
10	Drugs
11	Soaps, cleaners, and toilet goods
12	Agricultural chemicals
13	Industrial chemicals and synthetics
14	Other chemicals
15	Rubber products
16	Miscellaneous plastic products
17	Primary metal industries, ferrous
18	Primary metal industries, nonferrous
19	Fabricated metal products
20	Farm and garden machinery
21	Construction, mining, etc.
22	Computer and office equipment
23	Other nonelectric machinery
24	Household appliances
25	Household audio and video, etc.
26	Electronic components
27	Other electrical machinery
28	Motor vehicles and equipment
29	Other transportation equipment
30	Lumber, wood, furniture, etc.
31	Glass products
32	Stone, clay, concrete, gypsum, etc.
33	Instruments and apparatus
34	Other manufacturing

Source: Feenstra, Lipsey, and Bowen (1997).

The GDP and population are taken from World Development Indicators (WDI) database.

Distance, a proxy of trading costs, is calculated between the mass centers of the trade partners using the great-circle distance formula expressed in miles. Common national land border, a dummy variable, complements the

Table 3. List of Monetary Unions used in the Volume (1980–2001).

Name	Country	Year
U.S. dollar area	U.S.	1980–2001
	Dominican Republic	1980
	Guatemala	1980
	Panama	1980–2001
	Bahamas	1980–2001
	Bermuda	1980–2001
	Liberia	1980–1985
East Caribbean dollar area	Antigua and Barbuda	1980–2001
	Dominica	1980–2001
	Grenada	1980–2001
	St Vincent and The Grenadines	1980–2001
	St Christopher Kitts-Nevis	1980–2001
	St Lucia	1980–2001
Australian dollar area	Australia	1980–2001
	Kiribati	1980–2001
	Tonga	1980–1990
Rihal area	Qatar	1985–1995
	UAE	1985–1995
EMU countries	Austria	1999–2001
	Belgium	1999–2001
	Finland	1999–2001
	France	1999–2001
	Germany	1999–2001
	Ireland	1999–2001
	Italy	1999–2001
	Luxembourg	1999–2001
	The Netherlands	1999–2001
	Spain	1999–2001
	Portugal	1999–2001
CFA area	Central African Republic	1980–2001
	Cameroon	1980–2001
	Chad	1980–2001
	Congo Republic	1985–2001
	Equatorial Guinea	1980–2001
	Gabon	1980–2001
	Benin	1980–2001
	Burkina Faso	1980–2001
	Ivory Coast	1980–2001
	Mali	1985–2001
	Niger	1980–2001
	Senegal	1980–2001

Table 3. (*Continued*)

Name	Country	Year
	Togo	1980–2001
	Guinea-Bissau	1998–2001
Franc area	France	1980–2001
	Comoros	1980
	Madagascar	1980–1981
	Reunion	1980–1985
Indian rupee area	India	1995–2001
	Bhutan	1995–2001
Rand area	South Africa	1980–1999
	Lesotho	1980–1999
	Namibia	1980–1990
	Swaziland	1980–1999

distance variable as a proxy for adjacency of two trade partners. The mass centers of geographical locations and the national border information have been taken from the CIA World Factbook 2005 – http://www.cia.gov/cia/publications/factbook/.

Common language, colonial relationship, common colony, and common country variables also affect trading cost. Like common land border these variables are dummy variables, which are equal to one when two countries share the same cultural characteristics, otherwise they are zero. The original source of cultural characteristic variables is the CIA World Factbook 2005; otherwise we rely on other sources, such as, Microsoft Encarta 2004.

Two institutional variables are included in the gravity equation, both measured as binary variables: currency unions (CU) and Regional Trade Agreements (RTAs); for details see Tables 3, 4. Furthermore, Chapters 2, 8, and 10 employ an interregional dummy variable controlling for two countries in the trade pair belonging to different RTAs. Chapters 5 and 6 include other country-level characteristics in the gravity equation, such as number of islands between two trade partners, land area, religion, and political orientation; see Table 5.

2. TERRORISM AND THE GRAVITY EQUATION

This section discusses the other datasets employed in Chapter 10 by Michele Fratianni and Heejoon Kang on the impact of international terrorism on

Table 4. List of RTAs used in the Volume.

Name	Country	Year
European Union	Belgium	1970
	France	1970
	Germany	1970
	Italy	1970
	Luxembourg	1970
	The Netherlands	1970
	Denmark	1972
	Ireland	1972
	United Kingdom	1972
	Greece	1981
	Portugal	1986
	Spain	1986
	Austria	1995
	Sweden	1995
	Finland	1995
U.S.–IS	U.S.	1981
	Israel	1981
NAFTA	U.S.	1987
	Mexico	1994
	Canada	1987
CARICOM (Montserrat)	Antigua and Barbuda	1974
	Bahamas	1983
	Barbados	1974
	Belize	1974
	Dominica	1974
	Grenada	1974
	Guyana	1974
	Haiti	1998
	Jamaica	1974
	St Kitts and Nevis	1974
	St Lucia	1974
	St Vincent and the Grenadines	1974
	Surinam	1995
	Trinidad Tobago	1974
PATCRA	Australia	1978
	Papua New Guinea	1978
ANZCERTA	Australia	1984
	New Zealand	1984
CACM	Costa Rica	1962
	El Salvador	1962

Table 4. (*Continued*)

Name	Country	Year
	Guatemala	1962
	Honduras	1962
	Nicaragua	1962
MERCOSUR	Argentina	1992
	Brazil	1992
	Paraguay	1992
	Uruguay	1992
ASEAN (Brunei)	Philippines	1969
	Indonesia	1969
	Malaysia	1969
	Singapore	1969
	Thailand	1969
	Vietnam	1995
	People's Democratic Republic Laos	1997
	Burma	1997
	Cambodia	1999
SPARTECA (Cook, Marshall, Micronesia, Nauru Niue Tuvalu)	Australia	1982
	New Zealand	1982
	Fiji	1982
	Kiribati	1982
	Papua New Guinea	1982
	Solomon Islands	1982
	Tonga	1982
	Vanuatu	1982
	Samoa	1982
ANDEAN	Bolivia	1988
	Colombia	1988
	Ecuador	1988
	Peru	1988
	Venezuela	1988

Note: This is the list of RTAs used in Chapters 2, 8, and 10; Chapters 5 and 6 rely on a comprehensive list of RTAs relevant to their regions studied; for more details see Section 3 of this Technical Appendix. Countries in parentheses are member countries that are not part of the Regional Economic Integration database.

trade flows: international terrorism activity database, international disaster database, institutional quality database, and financial crisis database. Four datasets are frequently used in the economics and political science literature.[2] Countries covered in each database are reported in Table 1.

Table 5. Definition of the Additional Variables in Gravity Equation in Chapters 5 and 6.

Variables	Description
Island	Number of islands in the trade pair = 2, 1, or 0
Log_areas	Log of the product of the areas in square miles. The areas have been taken from the CIA World factbook 2005
Landlocked	Dummy variable = 0, 1, 2 depending on how many countries in the trade pair are landlocked
Curcol	Dummy variable = 1 if the two countries were in a colonial relationship in the year of the observation, 0 otherwise (*Source:* Microsoft Encarta 2004. http://www.wikipedia.org. March 2005)
Religprox	Religion proxy variables used for 7 major religions: Catholicism, Protestant, Orthodox, Judaism, Islam, Buddhism, and Hinduism (*Source:* The CIA World factbook 2005. Microsoft Encarta 2004); cf. Chapter 5 for more details
ex_com	= 1 when the trade partner is a country that ended communist rule in early 1990s: Albania, Bulgaria, Former Czechoslovakia, Former USSR, Former Yugoslavia, Hungary, Mongolia, Poland, Romania, and Vietnam; = 0 otherwise
ex_com_trend	= 1, 2, 3, … .from 1991 onward, = 0 otherwise, when the trade partner is a country that ended communist rule in early 1990s: Albania, Bulgaria, Former Czechoslovakia, Former USSR, Former Yugoslavia, Hungary, Mongolia, Poland, Romania, and Vietnam; = 0 otherwise
log_growth D_{ip}	Log of 1 + rate of growth of the demand in country "*i*" for goods in industry "*p*", from 1980–1984 to 1993–1997, as given by Eq. (9a) in Chapter 5
log growth Y_{jp}	Log of 1 + rate of growth of the production of industry "*p*" in country "*j*" from 1980–1984 to 1993–1997, as given by Eq. (9b) in Chapter 5

Note: This table comes from an earlier version of Agudelo and Davidson's Chapter 5.

International Terrorism: Attributes of Terrorist Events (ITERATE) is the most detailed and widely used dataset for research on terrorism. ITERATE provides information on terrorist attacks, terrorists, victims, and nationality, and estimates of damages; see Table 6. ITERATE is also employed in Chapter 11 dealing with the effect of political risk on foreign direct investment.

Emergency Events Database (EM-DAT) – available at http://www.em-dat.net/ – covers disasters since 1900. OECD (1994) deems that EM-DAT

Table 6. International Terrorism Activity Database (ITERATE).

Lists of Main Variables
Incident characteristics
1. Date of start of incident – year
2. Date of start of incident – month
3. Date of start of incident – day and incident code number
4. Location start
5. Location end
6. Scene of incident
7. Evidence of state sponsorship
8. Type of state sponsorship
9. Type of incident
10. Total number of nationalities involved in incident
Terrorist characteristics
11. First group initiating action
12. Second group initiating action
13. Number of terrorist groups directly involved
14. Number of terrorists in attack force
15. Number of female terrorists in attack force
16. Number of nationalities of terrorists in attack force
17. First nationality of terrorists in attack force
18. Second nationality of terrorists in attack force
19. Third nationality of terrorists in attack force
20. Recidivists in attack force
Victim characteristics
21. Number of victims
22. Number of nationalities of victims
23. First victim's nationality
24. Second victim's nationality
25. Third victim's nationality
26. Number of United States victims
27. Type of United States victim
28. Type of immediate victim
29. Nature of victim entities
Life and property losses
30. Total individuals wounded
31. Terrorists wounded
32. Foreign wounded
33. United States wounded
34. Government officials wounded
35. Total number of individuals killed
36. Terrorists killed
37. Foreign killed
38. United States killed

Table 6. (*Continued*)

Lists of Main Variables
39. Government officials killed
40. Amount of damage
41. Type of weapon used
Success/failure
42. Terrorist logistical success

Source: Mickolus, Sandler, Murdock, and Fleming (2005). Data Codebook.

Table 7. Disaster Database (EM-DAT).

EM-DAT Type	Disaster Name	World Total Frequency (1980–1999)
Natural disaster	Drought	341
	Earthquake	430
	Extreme temperature	129
	Famine	52
	Flood	1,272
	Slides	239
	Volcano	81
	Wave/surge	12
	Wild fires	159
	Wind storm	1,199
	Epidemic	457
	Insect infestation	57
Technological disaster	Industrial accident	511
	Transport accident	1,935
	Miscellaneous accident	467

Source: EM-DAT: The OFDA/CRED International Disaster Database.

is the closest approximation to a global database on disasters. EM-DAT is a spatial area-time specific data for 13 types (12 categories) of natural disaster and 3 types of technological disaster, and reports estimated damages in terms of number of persons killed, injured, requiring immediate assistance, and homeless. Table 7 lists the specific 15 categories of disasters and frequency for the period 1980–1999.

The International Country Risk Guide (ICRG), assembled by Political Risk Services, covers a wide spectrum of political, financial, and economic risk categories; see Table 8 for details. Researchers have used the overall index, components or subcomponents of the index, or applied modifications

Table 8. Institutional Quality Database (ICRG).

Political Risk		Economic Risk		Financial Risk	
Components	Points	Components	Points	Components	Points
Government stability	12	GDP per head	5	Foreign debt as a percentage of GDP	10
Socioeconomic conditions	12	Real GDP growth	10		
Investment profile	12	Annual inflation rate	10	Foreign debt service as a percentage of exports of goods and services	10
Internal conflict	12	Budget balance as a percentage of GDP	10		
External conflict	12				
Corruption	6	Current account as a percentage of GDP	15	Current account as a percentage of exports of goods and services	15
Military in politics	6				
Religion in politics	6				
Law and order	6			Net international liquidity as months of import cover	5
Ethnic tensions	6				
Democratic accountability	6			Exchange rate stability	10
Bureaucracy quality	4				
Total	100	Total	50	Total	50

Source: International Country Risk Guide, PRS group.

to suit their own research purpose. Users of ICRG include, among others, Hall and Jones (1999), who compiled rule of law, bureaucratic quality, corruption, risk of expropriation, and reputation of contracts by government; La Porta, Lopez, Shleifer, and Vishny (1998), who relied on the same Hall and Jones indices without bureaucratic quality; and Edison, Levine, Ricci, and Slok (2002), who focused on law and order and corruption.

The list of financial crises came from Bordo, Eichengreen, Klingebiel, and Martinez-Peria (2001), who identified currency and banking crises, and peaks and troughs of business cycle, for 53 countries, of which 22 were industrial and 31 developing countries. The original source of the data is the

Table 9. Currency and Banking Crises (1980–1998).

Country	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98
Argentina	B		C		C	B		C		B,C		C				B,C			
Australia				C		C				B									
Bangladesh	C	C						B											
Belgium			C																
Brazil								C			B,C				B				C
Canada		C					C												
Chile		B	C		C														
China	C						C			C			C						
Columbia			B																
Costa Rica		C						B											
Denmark								B					C	C					
Ecuador		B	C		C	C			C			C							
Egypt		B								C	B								
Finland							C					B,C		C					
France													C		B				
Greece				C		C													
Hong Kong			B	B															
Iceland		C			C														
India												C		C	B				
Indonesia				C			C						B					B,C	B,C
Ireland							B						B						
Italy											B		C			C			
Jamaica		C							C			C		C					
Japan													B						
Korea	C																	B,C	B,C
Malaysia						B												C	B,C
Mexico		B	C	C		C					C				B,C	C			
The Netherlands													C						

Table 9. (*Continued*)

Country	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98
New Zealand	C				C			B	C										
Nigeria		C					C		C			B,C		C	C				
Norway							C	B											
Pakistan									C		C			C		C		C	
Paraguay					C		C			C						B			
Peru				B,C					C		C		C						
Philippines		B	C	C			C				C							C	B
Portugal				C															
Singapore			B																C
South Africa		C	C		C	B	C		C				C			C			
Spain			C										C			C			
Sri Lanka										B									
Sweden												B	C						
Taiwan				B												B			
Thailand				B														B,C	B,C
Turkey			B		C							B,C			B,C	C			
United Kingdom			C										C						
Uruguay		B	C	C			C												
United States of America					B	C													
Venezuela	B						C			C				B	C	C			
Zimbabwe		B	C		C		C		C		C		C					C	

Note: B and C represent banking and currency crises, respectively.
Source: Bordo et al. (2001).

Table 10. Regional Trade Agreements in Existence (as of July 2005).

Agreement	Date of Entry into Force	Date	Type of Agreement
EC (Treaty of Rome)	January 1, 1958	November 10, 1995	Services agreement
EC (Treaty of Rome)	January 1, 1958	April 24, 1957	Customs union
EFTA (Stockholm convention)	May 3, 1960	November 14, 1959	Free trade agreement
CACM	October 12, 1961	February 24, 1961	Customs union
TRIPARTITE	April 1, 1968	February 23, 1968	Preferential arrangement
EFTA accession of Iceland	March 1, 1970	January 30, 1970	Accession to free trade agreement
EC–OCTs	January 1, 1971	December 14, 1970	Free trade agreement
EC–Switzerland and Liechtenstein	January 1, 1973	October 27, 1972	Free trade agreement
EC accession of Denmark, Ireland, and United Kingdom	January 1, 1973	March 7, 1972	Accession to customs union
PTN	February 11, 1973	November 9, 1971	Preferential arrangement
EC–Iceland	April 1, 1973	November 24, 1972	Free trade agreement
EC–Norway	July 1, 1973	July 13, 1973	Free trade agreement
CARICOM	August 1, 1973	October 14, 1974	Customs union
Bangkok agreement	June 17, 1976	November 2, 1976	Preferential arrangement
EC–Algeria	July 1, 1976	July 28, 1976	Free trade agreement
PATCRA	February 1, 1977	December 20, 1976	Free trade agreement
EC –Syria	July 1, 1977	July 15, 1977	Free trade agreement
SPARTECA	January 1, 1981	February 20, 1981	Preferential arrangement
EC accession of Greece	January 1, 1981	October 24, 1979	Accession to customs union
LAIA	March 18, 1981	July 1, 1982	Preferential arrangement
CER	January 1, 1983	April 14, 1983	Free trade agreement
United States–Israel	August 19, 1985	September 13, 1985	Free trade agreement

Table 10. (*Continued*)

Agreement	Date of Entry into Force	Date	Type of Agreement
EC accession of Portugal and Spain	January 1, 1986	December 11, 1985	Accession to customs union
CAN	May 25, 1988	October 12, 1992	Preferential arrangement
CER	January 1, 1989	November 22, 1995	Services agreement
GSTP	April 19, 1989	September 25, 1989	Preferential arrangement
Laos–Thailand	June 20, 1991	November 29, 1991	Preferential arrangement
EC–Andorra	July 1, 1991	March 9, 1998	Customs union
MERCOSUR	November 29, 1991	March 5, 1992	Customs union
AFTA	January 28, 1992	October 30, 1992	Preferential arrangement
EFTA–Turkey	April 1, 1992	March 6, 1992	Free trade agreement
EFTA–Israel	January 1, 1993	December 1, 1992	Free trade agreement
CEFTA	March 1, 1993	June 30, 1994	Free trade agreement
Armenia–Russian Federation	March 25, 1993	July 27, 2004	Free trade agreement
Kyrgyz Republic–Russian Federation	April 24, 1993	June 15, 1999	Free trade agreement
EC–Romania	May 1, 1993	December 23, 1994	Free trade agreement
EFTA–Romania	May 1, 1993	May 24, 1993	Free trade agreement
Faroe Islands–Norway	July 1, 1993	March 13, 1996	Free trade agreement
Faroe Islands–Iceland	July 1, 1993	January 23, 1996	Free trade agreement
EFTA–Bulgaria	July 1, 1993	July 7, 1993	Free trade agreement
MSG	July 22, 1993	October 7, 1999	Preferential arrangement
EC–Bulgaria	December 31, 1993	December 23, 1994	Free trade agreement
EEA	January 1, 1994	October 10, 1996	Services agreement
NAFTA	January 1, 1994	February 1, 1993	Free trade agreement
NAFTA	April 1, 1994	March 1, 1995	Services agreement

Table 10. (*Continued*)

Agreement	Date of Entry into Force	Date	Type of Agreement
Georgia–Russian Federation	May 10, 1994	February 21, 2001	Free trade agreement
COMESA	December 8, 1994	June 29, 1995	Preferential arrangement
CIS	December 30, 1994	October 1, 1999	Free trade agreement
Romania–Moldova	January 1, 1995	September 24, 1997	Free trade agreement
EC accession of Austria, Finland, and Sweden	January 1, 1995	January 20, 1995	Accession to customs union
EC accession of Austria, Finland, and Sweden	January 1, 1995	January 20, 1995	Accession to services agreement
EC–Bulgaria	February 1, 1995	April 25, 1997	Services agreement
EC–Romania	February 1, 1995	October 9, 1996	Services agreement
Faroe Islands–Switzerland	March 1, 1995	March 8, 1996	Free trade agreement
Kyrgyz Republic–Armenia	October 27, 1995	January 4, 2001	Free trade agreement
Kyrgyz Republic–Kazakhstan	November 11, 1995	September 29, 1999	Free trade agreement
SAPTA	December 7, 1995	April 25, 1997	Preferential arrangement
Armenia–Moldova	December 21, 1995	July 27, 2004	Free trade agreement
EC–Turkey	January 1, 1996	December 22, 1995	Customs union
Georgia–Ukraine	June 4, 1996	February 21, 2001	Free trade agreement
Armenia–Turkmenistan	July 7, 1996	July 27, 2004	Free trade agreement
Georgia–Azerbaijan	July 10, 1996	February 21, 2001	Free trade agreement
Kyrgyz Republic–Moldova	November 21, 1996	June 15, 1999	Free trade agreement
Armenia–Ukraine	December 18, 1996	July 27, 2004	Free trade agreement
EC–Faroe Islands	January 1, 1997	February 19, 1997	Free trade agreement
Canada–Israel	January 1, 1997	January 23, 1997	Free trade agreement
Israel–Turkey	May 1, 1997	May 18, 1998	Free trade agreement
CARICOM	July 1, 1997	February 19, 2003	Services agreement

Table 10. (*Continued*)

Agreement	Date of Entry into Force	Date	Type of Agreement
CEFTA accession of Romania	July 1, 1997	January 8, 1998	Accession to free trade agreement
EC–Palestinian authority	July 1, 1997	June 30, 1997	Free trade agreement
Canada–Chile	July 5, 1997	November 13, 1997	Services agreement
Canada–Chile	July 5, 1997	August 26, 1997	Free trade agreement
EAEC	October 8, 1997	April 21, 1999	Customs union
Croatia–FYROM	October 30, 1997	April 1, 2005	Free trade agreement
Kyrgyz Republic–Ukraine	January 19, 1998	June 15, 1999	Free trade agreement
Romania–Turkey	February 1, 1998	May 18, 1998	Free trade agreement
EC–Tunisia	March 1, 1998	March 23, 1999	Free trade agreement
Kyrgyz Republic–Uzbekistan	March 20, 1998	June 15, 1999	Free trade agreement
Georgia–Armenia	November 11, 1998	February 21, 2001	Free trade agreement
Bulgaria–Turkey	January 1, 1999	May 4, 1999	Free trade agreement
CEFTA accession of Bulgaria	January 1, 1999	March 24, 1999	Accession to free trade agreement
CEMAC	June 24, 1999	September 29, 2000	Preferential arrangement
EFTA–Palestinian authority	July 1, 1999	September 21, 1999	Free trade agreement
Georgia–Kazakhstan	July 16, 1999	February 21, 2001	Free trade agreement
Chile–Mexico	August 1, 1999	March 14, 2001	Services agreement
Chile–Mexico	August 1, 1999	March 8, 2001	Free trade agreement
EFTA–Morocco	December 1, 1999	February 18, 2000	Free trade agreement
Georgia–Turkmenistan	January 1, 2000	February 21, 2001	Free trade agreement
EC–South Africa	January 1, 2000	November 21, 2000	Free trade agreement
WAEMU/UEMOA	January 1, 2000	February 3, 2000	Preferential arrangement

Table 10. (*Continued*)

Agreement	Date of Entry into Force	Date	Type of Agreement
Bulgaria–Former Yugoslav Republic of Macedonia	January 1, 2000	February 18, 2000	Free trade agreement
EC–Morocco	March 1, 2000	November 8, 2000	Free trade agreement
EC–Israel	June 1, 2000	November 7, 2000	Free trade agreement
Mexico–Israel	July 1, 2000	March 8, 2001	Free trade agreement
EC–Mexico	July 1, 2000	August 1, 2000	Free trade agreement
EAC	July 7, 2000	October 11, 2000	Preferential arrangement
SADC	September 1, 2000	August 9, 2004	Free trade agreement
Turkey–Former Yugoslav Republic of Macedonia	September 1, 2000	January 22, 2001	Free trade agreement
Croatia–Bosnia and Herzegovina	January 1, 2001	October 6, 2003	Free trade agreement
New Zealand–Singapore	January 1, 2001	September 19, 2001	Free trade agreement
New Zealand–Singapore	January 1, 2001	September 19, 2001	Services agreement
EFTA–Former Yugoslav Republic of Macedonia	January 1, 2001	January 31, 2001	Free trade agreement
EC–Mexico	March 1, 2001	June 21, 2002	Services agreement
EC–FYROM	June 1, 2001	November 21, 2001	Free trade agreement
Romania–Israel	July 1, 2001	April 25, 2005	Free trade agreement
EFTA–Mexico	July 1, 2001	August 22, 2001	Free trade agreement
EFTA–Mexico	July 1, 2001	August 22, 2001	Services agreement
India–Sri Lanka	December 15, 2001	June 27, 2002	Free trade agreement
United States–Jordan	December 17, 2001	October 18, 2002	Services agreement
United States–Jordan	December 17, 2001	March 5, 2002	Free trade agreement
Armenia–Kazakhstan	December 25, 2001	July 27, 2004	Free trade agreement
Bangkok Agreement–Accession of China	January 1, 2002	July 29, 2004	Accession to preferential arrangement

Table 10. (*Continued*)

Agreement	Date of Entry into Force	Date	Type of Agreement
Bulgaria–Israel	January 1, 2002	April 14, 2003	Free trade agreement
EFTA–Jordan	January 1, 2002	January 22, 2002	Free trade agreement
EFTA–Croatia	January 1, 2002	January 22, 2002	Free trade agreement
Chile–Costa Rica	February 15, 2002	May 24, 2002	Services agreement
Chile–Costa Rica	February 15, 2002	May 14, 2002	Free trade agreement
EC–Croatia	March 1, 2002	December 20, 2002	Free trade agreement
EC–Jordan	May 1, 2002	December 20, 2002	Free trade agreement
Chile–El Salvador	June 1, 2002	February 16, 2004	Free trade agreement
Chile–El Salvador	June 1, 2002	March 17, 2004	Services agreement
EFTA	June 1, 2002	December 3, 2002	Services agreement
Albania–FYROM	July 1, 2002	December 14, 2004	Free trade agreement
FYROM–Bosnia and Herzegovina	July 15, 2002	May 11, 2005	Free trade agreement
Canada–Costa Rica	November 1, 2002	January 17, 2003	Free trade agreement
Japan–Singapore	November 30, 2002	November 14, 2002	Services agreement
Japan–Singapore	November 30, 2002	November 14, 2002	Free trade agreement
EFTA–Singapore	January 1, 2003	January 24, 2003	Services agreement
EFTA–Singapore	January 1, 2003	January 24, 2003	Free trade agreement
EC–Chile	February 1, 2003	February 18, 2004	Free trade agreement
CEFTA accession of Croatia	March 1, 2003	March 3, 2004	Accession to free trade agreement
EC–Lebanon	March 1, 2003	June 4, 2003	Free trade agreement
Panama–El Salvador	April 11, 2003	April 5, 2005	Services agreement
Panama–El Salvador	April 11, 2003	March 18, 2005	Free trade agreement
Croatia–Albania	June 1, 2003	March 31, 2004	Free trade agreement
ASEAN–China	July 1, 2003	December 21, 2004	Preferential arrangement

Table 10. (*Continued*)

Agreement	Date of Entry into Force	Date	Type of Agreement
Turkey–Bosnia and Herzegovina	July 1, 2003	September 8, 2003	Free trade agreement
Turkey–Croatia	July 1, 2003	September 8, 2003	Free trade agreement
Singapore–Australia	July 28, 2003	October 1, 2003	Services agreement
Singapore–Australia	July 28, 2003	October 1, 2003	Free trade agreement
Albania–Bulgaria	September 1, 2003	March 31, 2004	Free trade agreement
Albania–UNMIK (Kosovo)	October 1, 2003	April 8, 2004	Free trade agreement
Romania–Bosnia and Herzegovina	October 24, 2003	February 14, 2005	Free trade agreement
Romania–FYROM	January 1, 2004	February 14, 2005	Free trade agreement
Albania–Romania	January 1, 2004	December 14, 2004	Free trade agreement
China–Macao, China	January 1, 2004	January 12, 2004	Free trade agreement
China–Macao, China	January 1, 2004	January 12, 2004	Services agreement
China–Hong Kong, China	January 1, 2004	January 12, 2004	Free trade agreement
China–Hong Kong, China	January 1, 2004	January 12, 2004	Services agreement
United States–Singapore	January 1, 2004	December 19, 2003	Free trade agreement
United States–Singapore	January 1, 2004	December 19, 2003	Services agreement
United States–Chile	January 1, 2004	December 19, 2003	Free trade agreement
United States–Chile	January 1, 2004	December 19, 2003	Services agreement
Republic of Korea–Chile	April 1, 2004	April 19, 2004	Free trade agreement
Republic of Korea–Chile	April 1, 2004	April 19, 2004	Services agreement
Moldova–Bosnia and Herzegovina	May 1, 2004	January 28, 2005	Free trade agreement
EU enlargement	May 1, 2004	April 30, 2004	Accession to customs union
EU enlargement	May 1, 2004	April 28, 2004	Accession to services agreement
Bulgaria–Serbia and Montenegro	June 1, 2004	March 11, 2005	Free trade agreement
EC–Egypt	June 1, 2004	October 4, 2004	Free trade agreement

Table 10. (*Continued*)

Agreement	Date of Entry into Force	Date	Type of Agreement
Romania–Serbia and Montenegro	July 1, 2004	February 14, 2005	Free trade agreement
Moldova–Serbia and Montenegro	September 1, 2004	January 28, 2005	Free trade agreement
Albania–Serbia Montenegro	September 1, 2004	October 19, 2004	Free trade agreement
Moldova–Croatia	October 1, 2004	January 31, 2005	Free trade agreement
Albania–Moldova	November 1, 2004	December 20, 2004	Free trade agreement
Bulgaria–Bosnia and Herzegovina	December 1, 2004	March 11, 2005	Free trade agreement
Moldova–FYROM	December 1, 2004	January 31, 2005	Free trade agreement
Moldova–Bulgaria	December 1, 2004	January 28, 2005	Free trade agreement
Albania–Bosnia and Herzegovina	December 1, 2004	December 14, 2004	Free trade agreement
EFTA–Chile	December 1, 2004	December 10, 2004	Free trade agreement
EFTA–Chile	December 1, 2004	December 10, 2004	Services agreement
Thailand–Australia	January 1, 2005	January 5, 2005	Free trade agreement
Thailand–Australia	January 1, 2005	January 5, 2005	Services agreement
U.S.–Australia	January 1, 2005	December 23, 2004	Free trade agreement
U.S.–Australia	January 1, 2005	December 23, 2004	Services agreement
Japan–Mexico	April 1, 2005	April 22, 2005	Free trade agreement
Japan–Mexico	April 1, 2005	April 22, 2005	Services agreement
EFTA–Tunisia	June 1, 2005	June 7, 2005	Free trade agreement
ECO	Not available	July 22, 1992	Preferential arrangement
GCC	Not available	October 11, 1984	Preferential arrangement

Source: WTO, http://www.wto.org/english/tratop_e/region_e/region_e.htm.

IMF World Economic Outlook (1998), available at http://www.imf.org/external/pubs/ft/weo/weorepts.htm. Financial crises are defined as episodes of financial-market volatility marked by significant problems of illiquidity and insolvency among financial-market participants and/or by official

Table 11. List of RTA Acronyms.

Acronym	Definition	Member Countries
AFTA	ASEAN Free Trade Area	Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, Vietnam
ASEAN	Association of South East Asian Nations	Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, Vietnam
BAFTA	Baltic Free Trade Area	Estonia, Latvia, Lithuania
BANGKOK	Bangkok Agreement	Bangladesh, China, India, Republic of Korea, Laos, Sri Lanka
CAN	Andean Community	Bolivia, Colombia, Ecuador, Peru, Venezuela
CARICOM	Caribbean Community and Common Market	Antigua and Barbuda, Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, Monserrat, Trinidad and Tobago, St Kitts and Nevis, St Lucia, St Vincent and the Grenadines, Surinam
CACM	Central American Common Market	Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua
CEFTA	Central European Free Trade Agreement	Bulgaria, Czech Republic, Hungary, Poland, Romania, Slovak Republic, Slovenia
CEMAC	Economic and Monetary Community of Central Africa	Cameroon, Central African Republic, Chad, Congo, Equatorial Guinea, Gabon
CER	Closer Trade Relations Trade Agreement	Australia, New Zealand
CIS	Commonwealth of Independent States	Azerbaijan, Armenia, Belarus, Georgia, Moldova, Kazakhstan, Russian Federation, Ukraine, Uzbekistan, Tajikistan, Kyrgyz Republic
COMESA	Common Market for Eastern and Southern Africa	Angola, Burundi, Comoros, Democratic Republic of Congo, Djibouti, Egypt, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Namibia, Rwanda,

Table 11. (*Continued*)

Acronym	Definition	Member Countries
		Seychelles, Sudan, Swaziland, Uganda, Zambia, Zimbabwe
EAC	East African Cooperation	Kenya, Tanzania, Uganda
EAEC	Eurasian Economic Community	Belarus, Kazakhstan, Kyrgyz, Republic Russian Federation, Tajikistan
EC	European Communities	Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, The Netherlands, Portugal, Spain, Sweden, United Kingdom
ECO	Economic Cooperation Organization	Afghanistan, Azerbaijan, Iran, Kazakhstan, Kyrgyz, Republic Pakistan, Tajikistan, Turkey, Turkmenistan, Uzbekistan
EEA	European Economic Area	EC, Iceland, Liechtenstein, Norway
EFTA	European Free Trade Association	Iceland, Liechtenstein, Norway, Switzerland
GCC	Gulf Cooperation Council	Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates
GSTP	General System of Trade Preferences among Developing Countries	Algeria, Angola, Argentina, Bangladesh, Benin, Bolivia, Brazil, Cameroon, Chile, Colombia, Cuba, Democratic People's Republic of Korea, Ecuador, Egypt, Ghana, Guinea, Guyana, Haiti, India, Indonesia, Islamic, Republic of Iran, Iraq, Libya, Malaysia, Mexico, Morocco, Mozambique, Nicaragua, Nigeria, Pakistan, Peru, Philippines, Qatar, Republic of Korea, Romania, Singapore, Sri Lanka, Sudan, Thailand, Trinidad and Tobago, Tunisia, United Republic of Tanzania, Uruguay, Venezuela, Vietnam, Yugoslavia, Zaire, Zimbabwe
LAIA	Latin American Integration Association	Argentina, Bolivia, Brazil, Chile, Colombia, Cuba, Ecuador,

Table 11. (*Continued*)

Acronym	Definition	Member Countries
		Mexico, Paraguay, Peru, Uruguay, Venezuela
MERCOSUR	Southern Common Market	Argentina, Brazil, Paraguay, Uruguay
MSG	Melanesian Spearhead Group	Fiji, Papua New Guinea, Solomon Islands, Vanuatu
NAFTA	North American Free Trade Agreement	Canada, Mexico, United States
OCT	Overseas Countries and Territories	Anguilla, Cayman Islands, Falkland Islands, South Georgia and the South Sandwich Islands, Montserrat, Pitcairn, St Helena, Ascension Island, Tristan da Cunha, British Antarctic Territory, British Indian Ocean Territory, Turks and Caicos Islands, British Virgin Islands, Mayotte, New Caledonia, French Polynesia, St Pierre and Miquelon, French Southern and Antarctic Territories, Wallis and Futuna, Aruba, Netherlands Antilles, Greenland
PATCRA	Papua New Guinea–Australia Trade and Commercial Relations Agreement	Papua New Guinea, Australia
PTN	Protocol relating to Trade Negotiations among Developing Countries	Bangladesh, Brazil, Chile, Egypt, Israel, Mexico, Pakistan, Paraguay, Peru, Philippines, Republic of Korea, Romania, Tunisia, Turkey, Uruguay, Yugoslavia
SADC	South African Development Community	Angola, Botswana, Congo Democratic Republic, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia, Zimbabwe
SAPTA	South Asian Preferential Trade Arrangement	Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, Sri Lanka

Table 11. (*Continued*)

Acronym	Definition	Member Countries
SPARTECA	South Pacific Regional Trade and Economic Cooperation Agreement	Australia, New Zealand, Cook Islands, Fiji, Kiribati, Marshall Islands, Micronesia, Nauru, Niue, Papua New Guinea, Solomon Islands, Tonga, Tuvalu, Vanuatu, Western Samoa
TRIPARTITE	Tripartite Agreement	Egypt, India, Yugoslavia
UEMOA/WAEMU	West African Economic and Monetary Union	Benin, Burkina Faso, Côte d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal, Togo

intervention to contain those consequences. The specific criteria are forced changes in parity, abandonment of a pegged exchange rate, or an international rescue and financial distress resulting in the erosion of most or all of the aggregate banking system capital; see Table 9 for details.

3. REGIONAL TRADE AGREEMENTS

There are more than 250 RTAs, covering trade in goods or services. Not all of them are enforced at the time of writing and half of the enforced ones emerged after 2000. Many of the discontinued RTAs have been superseded by redesigned agreements among the same signatories. (http://www.wto.org/english/tratop_e/region_e/regfac_e.htm). Tables 10 and 11 provide a comprehensive list of RTAs as well as the definition and membership for each RTA.

NOTES

1. Rose data sets are not updated after 1999 and BEA breakdowns for Feenstra are only available up to 1997. Detail calibrating methods for Feenstra's data are documented at Feenstra (2000).
2. See Chapter 10 for those academic articles.

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