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EXPANDING RTAs, TRADE FLOWS,

AND THE MULTINATIONAL ENTERPRISE

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Abstract

We test the relationship between the size of regional trade agreements (RTA) and openness by using a gravity equation with multilateral trade factors. Our sample includes eleven RTAs, seven with constant membership and four with expanding membership. Regional trade bias declines with the size of the club; three of the four expanding RTAs have already surpassed their 'optimal' size. We also explore the link between openness of the RTA and the geographic strategy of the multinational enterprise. We find strong evidence in favor of the regionalization strategy, which has been enhanced by the presence of RTAs.

Key Words: Trade Blocks, Regional Integration, Multinational Enterprises (MNEs), Plurilateral RTAs, Trade Creation, Trade Diversion.

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INTRODUCTION

Regional trade agreements (RTAs) are an integral part of the international trade system and have been since the European Economic Community was launched in 1958. Two observations stand out. The first is that RTAs have been rapidly rising in numbers and complexity (Crawford & Fiorentino, 2005).[1] The second is that several of them have expanded in membership and in relative economic size. The European Union (EU) has grown from the original six members of 1958 to the current (2007) size of 27; and further enlargements are in the making. The economic size of the EU is now comparable to that of the United States. The Association of South East Asian Nations (ASEAN) has gone through a few expansion phases; as of 2007, it had 10 members and one candidate, East Timor, waiting to join. The economic size of ASEAN is approximately 15 per cent of that of the EU. The North American Free Trade Association (NAFTA) has enlarged once, in 1994 with the addition of Mexico to Canada and the United States. The Southern Common Market (MERCOSUR) has also enlarged once, in 2006 with the addition of Venezuela to the original four members; it has five associate members and one observer.

The RTA phenomenon has sparked a growing literature on the role of RTAs in the international trade system; see review article by Panagariya (2000). Our paper intends to address empirically the relationship between RTA size and trade bias and then connect different degrees of openness of the blocs to alternative expansion strategies of multinational enterprises (MNEs). On the first relationship, we are motivated by an old question and a new question. The old question is whether RTAs are "building" or "stumbling" blocs, where "building" means that RTAs expand world trade and "stumbling" means the opposite.[2] A pure building bloc occurs when RTA members' trade with one another in excess of the trade flows implied by a reference

model and without any reduction of trade flows between members and non-members, again beyond the trade flows implied by a reference model. This corresponds to the case of trade creation without trade diversion in Viner's (1950) classic study of customs unions. If trade diversion occurs, the RTA expands world trade only if trade creation exceeds trade diversion; we may call it a weak building bloc. If trade diversion fully offsets trade creation, the RTA fully reallocates trade from outsiders to insiders; we may call it a weak stumbling bloc. If trade diversion more than fully offsets trade creation, the RTA is a pure stumbling bloc.

The new question deals with RTA expansion. Larger internal markets resulting from expanding RTAs may make it easier to implement beyond-the-border liberalization programs, as the EU did in the 1980s with its internal market initiative. Trade creation rises, but trade diversion may rise as well. Since larger RTAs tend to have a higher ratio of internal trade to GDP than smaller RTAs, the pressure to liberalize trade with non-members may decline. Not surprisingly, the EU and the United States protect sensitive sectors like agriculture and textiles where developing countries have a comparative advantage.[3] In the end, whether an expanding RTA tends to be more of a building than a stumbling bloc is an empirical issue.

On the relationship between RTAs and the activity of the MNEs, the literature seems to provide little guidance. Indeed, Dunning, Fujita, and Yakova (2007) and Buckley et al. (2001) emphasize that further research on the role of enlarged RTAs are required to understand MNE globalization and regionalization strategies and the impact of regional integration on foreign direct investment (FDI). We gain more insights from the theories of foreign direct investment, an activity predominantly undertaken by MNEs. Traditional theories underscore the substitutability between exports and FDI in an environment of declining trade costs (Brainard 1997; Markusen & Venables 2000). Yet, the data show that these two variables have a positive correlation. Newer

models try to predict complementarity between exports and FDI by focusing on the incentives of lower-cost MNEs to acquire foreign higher-cost MNEs after a liberalization program in the host country or horizontal investment abroad to exploit export opportunities in a larger economic area like a RTA (Neary, 2006, 2007). In a world interlaced with RTAs, the MNE can pursue several alternative strategies: it can be global in the sense that it can operate in more than one RTA market, as well as in countries that are not affiliated to RTAs; it can be regional in the sense that the bulk of its activities is carried out inside a given RTA without a dominant domestic focus; it can be regional-domestic in the sense that the bulk of its activities takes place in the home market. The relevance of the RTA is that it conditions the environment in which the MNE operates. The more open the environment the more likely that the RTA will find it profitable to be outward looking.

Our research strategy is as follows. We first estimate the size of the regional trade bias and trade diversion for each of eleven RTAs relative to a reference model. The reference model is the gravity equation (GE) of bilateral trade flows developed by Anderson and van Wincoop (2003, AvW for short); our sample period covers 24 years, 1980 through 2003. A critical feature of this GE is that trade flows, not only reflect the forces of bilateral trade barriers, but also the barriers between all other countries and a given country pair. Older GEs that ignore multilateral trade factors are fraught with an omitted variable problem and do not yield consistent and efficient estimates of trade creation and trade diversion; consequently, the empirical findings based on these older GEs have to be taken with a grain of salt (Carrère, 2006). We will also estimate trade creation and trade diversion effects for the different sizes of four RTAs that have enlarged over the sample period. These estimates allow us to infer whether size increases have gone more in the direction of enhancing than erecting obstacles to world trade growth. We then

move to firm-level behavior with an intention to show that there is a connection between the "macro" and the "micro" results. We will build an empirical model that explains the MNE's foreign activity in terms of, among other things, participation in the inside and outside-RTAs and degrees of openness of these institutions.

The paper is organized as follows. We first review the theoretical and empirical literature on the relationship between the size of RTAs, trade creation and trade diversion. We then formulate the gravity equation with multilateral trade factors and the main econometric issues underlying the testing of this equation. Next, we discuss the "macro" empirical findings. Next, we analyze empirically the relevance of the RTA environment for MNEs' activity with firm-level data. The final section is dedicated to concluding comments.

SIZE OF RTA, TRADE CREATION AND TRADE DIVERSION

In this section we review the essential theoretical literature that relates to our topic of the relationship between RTA size and global trade, as well as some of the empirical literature on the trade creation and trade diversion effects due to RTAs.

Krugman (1991) examines the trade effects of an expansion in the size of trading blocs. His point of departure is an exogenous number of RTAs of equal size, which set tariffs non-cooperatively. An increase in the size of the blocs produces a classic combination of trade creation and trade diversion. The enlarging RTAs divert trade partly because some of the trade between blocs occurs now within the blocs and partly because these charge a higher external tariff. Welfare level is described by a U-shaped function in the number of RTAs. A single RTA in the world does best because it promotes global free trade; many RTAs do well because they have small power and levy low tariffs; and an intermediate number of RTAs produces the worst

outcome. Trade diversion occurs if instead the tariffs are set cooperatively. Bond and Syropoulos (1996) relax Krugman's assumption of symmetric blocs and obtain that a bloc has an incentive to enlarge because by expanding it can increase welfare for its members above the free trade level. A more ambiguous case for RTAs comes from Yi's (1996) model of endogenous customs union under imperfect competition. With symmetric countries, welfare improves for member countries but declines for non-member countries. Customs unions can perform as building blocs (towards global free trade) under open regionalism, where any country that applies to an RTA is accepted; however, they can become stumbling blocs when the decision to enlarge requires unanimity.

Andriamananjara (1999) develops a model of endogenous RTAs from a setting in which each national market has a single firm and is perfectly segmented, yet all firms produce perfectly substitutable goods. RTAs expand because firms make higher profits in a larger RTA than in a smaller RTA; clearly, insiders must allow the expansion. A larger club has two effects. The first is the noted positive effect on profits due to a larger market with preferential treatment. The profit effect, however, declines as the RTA enlarges because the oligopoly power of each firm declines with RTA size. The second effect is that the formation of an RTA reduces the profits of the outsiders, which have an incentive to join the RTA. The optimal size of the club is not the world because insiders have an interest in restraining membership.

On the empirical side, Frankel, Stein, and Wei (1996) estimate a bilateral trade GE for 63 countries for the period 1965-1992 and find positive and statistically significant regional trade biases and a mixture of trade creation and trade diversion effects. Soloaga and Winters (2001) estimate a GE for 58 countries for the period 1980-1996, separating import from export trade diversion effects. Unlike Frankel et al. (1996), they do not find statistically significant regional trade biases, but uncover import and export trade diversion for the EU and EFTA. Latin

American RTAs, on the other hand, expanded total imports. Bayoumi and Eichengreen (1997) detect trade diversion effects in the EU: the annual growth of trade between member countries and industrial non-member countries fell by 1.7 percentage points over 1956-1973. Crawford and Laird (2001) analyze trade data from six RTAs and find that for the period 1990-1999 the average annual growth of imports from non-members is slightly smaller than the average annual growth of insiders' imports.

It is worth repeating that empirical work based on old GEs –those that ignore multilateral trade factors– may be unreliable. Carrère (2006), after correcting for possible econometric misspecifications of the GE (which will be discussed in the next section), finds that her sample of seven RTAs generates a mixture of trade creation and trade diversion effects. In particular, regional trade biases, over the period 1962 to 1996, were increasing through the expansion phases of the EU, MERCOSUR and NAFTA, accompanied often by a decline of imports from and exports to outsiders. Baier and Bergstrand (2007) adopt a research similar to Carrère's (again, see next section) and find strong evidence of the RTA average contribution to expand member countries' trade. Their paper, however, neither sorts out trade creation from trade diversion effects nor explores the marginal contribution of RTA size to bilateral imports.

THE GRAVITY EQUATION AND ECONOMETRIC ISSUES

It is now accepted that bilateral trade flows are best explained by the GE; see, among others, Bergstrand (1985: 474), Leamer and Levinsohn (1995: 1384), Deardorff (1998: 7), and Feenstra, Markusen, and Rose. (2001: 431). The GE 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). For this paper, we rely on the formulation by AvW.

In the AvW setting, countries enjoy complete specialization and consumers have homothetic preferences.[4] Country *i* produces good *i* at price p_i. In country *j*, the good is sold at price $p_{ij} = p_i (1 + t_{ij})$, where t_{ij} imbeds a host of trade costs including transport and transaction costs, regime costs arising from differences in legal systems and practices, languages, networks, competitive policies, and monetary regimes, and tariffs or tariff-equivalent restrictions aimed at discriminating against foreign producers. These costs are, for the most part, non-observable and are proxied by physical distance, cultural distance and institutional distance. Thus, countries that are geographically distant face a higher t_{ij} than contiguous pairs; countries that speak the same language and have common roots face a lower t_{ij} than pairs with heterogeneous cultural background; countries that share the same currency and the same central bank face a lower t_{ij} than nations with different currencies and central banks; and finally countries that belong to the same RTA face lower t_{ij} than countries that do not. Bilateral trade flows are determined as follows (see AvW, eq. 9):

$$x_{ij} = y_i y_j / y_w (t_{ij} / P_i P_j)^{1-\sigma}, \quad (1)$$

where x_{ij} = exports from country i to country j, y = income, the subscript w = world, σ = the elasticity of substitution coefficient, P = the consumer price level. P_i and P_j stand for the multilateral trade costs in the AvW model and are a function of all t_{ij} pairs, countries' income

shares and countries' price levels. For $\sigma > 1$, bilateral trade flows rise (fall) if multilateral trade costs rise (fall) relative to bilateral trade costs. P_i and P_j are jointly determined and their omission creates a bias in the estimated coefficients.

The testable equation of (1) is:

$$(2) \qquad \ln(x_{ijt}) = \alpha_0 + \alpha_1 \ln(y_i y_j)_t + \alpha_2 \ln(I_i I_j)_t + \alpha_3 \ln(d_{ij}) + \alpha_4 CC_{ijt} + \alpha_5 \ln P_i + \alpha_6 \ln P_j + \beta_1 \text{Same-RTA}_{ijt} + \beta_2 \text{Im-RTA}_{ijt} + \beta_3 \text{Ex-RTA}_{ijt} + \alpha_t + u_{ijt}.$$

The new terms are as follows. I is per capita income; d is distance; CC is a vector of dummy variables that capture various types of cost-reducing affinities shared by the pair of countries – such as common border, common language, common colonizer, common relationship and common currency–; the three RTA variables capture trade creation and trade diversion effects generated by the RTA and are discussed fully below; a_t is a time effect common to all country pairs; and $u_{ijt} = \mu_{ij} + \varepsilon_{ijt}$, where μ_{ij} is either a fixed or random unobserved bilateral effect and ε_{ijt} is the residual error term. It should be noted that (2) descends directly from (1). The per capita income emerges from (1) through the countries' income shares that influence the two price levels; these income shares are proxied by population.

Trade creation and trade diversion effects and RTA size

In the GE literature, trade creation and trade diversion effects generated by RTAs have been typically modeled by two dummy variables: Same-RTA, which is equal to one when both countries in the pair belong to the same RTA and zero otherwise, and Im-RTA, which is equal to one when the import country belongs to the RTA and the export country does not and zero

otherwise; for more details, see Soloaga and Winters (2001). Pure trade creation is implied by $\beta_1 > 0$ and $\beta_2 = 0$. An expanding RTA that has those empirical characteristics can be said to have moved in the direction of an optimal size and to have raised welfare. If β_2 is negative, trade diversion emerges and the case for RTA depends on the relative numerical size of the positive β_1 and negative β_2. An expanding RTA moves weakly in the "good" direction, towards an optimal size, if the positive β_1 is numerical larger than the negative β_2. Pure trade diversion occurs when β_2 is equal to β_1; the expanding RTA, in this case, has moved in the "wrong" direction.

Soloaga and Winters (2001) point out that this two-dummy approach ignores the effect of the RTA on non-members' exports and the possibility that RTA members can gain at the expense of non-members.[5] These authors propose a third dummy, Ex-RTA, which is equal to one when the export country belongs to the RTA and the import country does not, and zero otherwise. With a three-dummy approach, the assessment of whether an expanding RTA is moving in the right or wrong direction depends, not only on the relative numerical size of β_1 and β_2, but also of β_1 and β_3. Carrère (2006) adopts the Soloaga-Winters three-dummy approach.

The biggest challenge in estimating (2) is to make sure that one captures the multilateral trade factors; otherwise, the error term of the regression will imbed the effects of the variables that determine the two sets of prices and will create a bias in the other coefficients of the regression. AvW (pp. 179-180) solve the problem by estimating with nonlinear least squares a simultaneous system of equations for cross-section data. Rose and van Wincoop (2001) and Feenstra (2003) propose the use of country fixed effects, but this alternative is only applicable to cross-section data. Baldwin and Taglioni (2006) discuss pitfalls of panel estimation in the presence of multilateral trade factors. These authors dismiss the use of country fixed effects because they fail to take into account that P_i and P_j vary over time. They recommend instead

country-pair fixed effects, as well as separate time fixed effects, to capture all pairwise idiosyncratic characteristics. In sympathy with AvW's approach, an earlier study by Bikker (1987) had already pointed out that a simple GE cannot correctly estimate trade creation and trade diversion due to restrictions on the degree of substitution (σ in (1)); Bikker estimates these substitution effects for import and export countries with a simultaneous equation model. Since country fixed effects in the GE estimates imbed that each country-pair has its own degree of substitution, Bikker's model becomes a special case of the country-pair effect GE.[6] Carrère (p. 231) accepts that country-pair fixed effects yield unbiased estimates of time-varying variables, but this model has the drawback of eliminating time-invariant variables. The alternative is to estimate country-pair effects as random variables. We will estimate equation (2) under the two alternatives of fixed and random country-pair effects, in addition to fixed year effects. We will compare the two models and test the null hypothesis that the fixed effects model is not better than the random effects model. If the null cannot be rejected, we will then use the random model to infer trade creation and trade diversion effects of RTAs.

Finally, there is the issue of endogenous RTAs. In the theory section, we have referred to models where the selection of RTAs is determined endogenously by the models. Baier and Bergstrand (2002) report that it is difficult to identify economic and political variables that influence the formation of RTAs. In their empirical work these authors obtain unstable estimates and resort to the assumption that the RTA phenomenon moves slowly relative to trade flows; any potential endogeneity bias can be attenuated with panel estimation. Carrère endogenizes RTAs with an instrumental variable technique applied to panel data. Baier and Bergstrand (2007) return to the theme of endogeneity and propose various econometric solutions; their preferred one is a GE estimated on first-differenced panel data with fixed country-pair effects. We have done

similar testing and found no significant difference between the "exogenous" and the "endogenous" specification.[7] The focus of this study and space constraints are not suitable for us to elaborate on these findings, but we will provide them to interested readers upon request. In sum, based on the principle of parsimony we will report and draw inferences only from the "exogenous" specification of RTAs.

DATA

We briefly discuss our data here and invite the interested reader to check the Indiana University CIBER Website (http://www.kelley.iu.edu/ciber/research.cfm) and Appendix 1 for more details.

Our data set consists of 215,500 annual observations covering 143 countries over the period 1980 to 2003: see Appendix 2 for the list of 143 countries. Country-level bilateral imports in U.S. dollars come from the World Trade Analyzer (WTA) by Statistics Canada. The remainder of the data, with the exception of currency unions and RTAs, come from Rose (2005) for the period 1980-1999 and our own update using the same sources as Rose's for the years 2000 through 2003. On RTAs, we identify eleven separate agreements that account for 40 percent of world trade: ASEAN, CARICOM (Caribbean Community and Common Market), EU, NAFTA, ANDEAN (Andean Community of Nations), ANZCERTA (the Australia-New Zealand Closer Economic Relations Trade Agreement), CACM (Central American Common Market), MERCOSUR, PATCRA (Papua New Guinea-Australia Trade and Commercial Relations Agreement), SPARTECA (South Pacific Region Trade and Economic Cooperation Agreement), and USIS (the United States-Israel Free Trade Agreement). The first four of the eleven RTAs have expanded since 1980. Details of the formation and enlargements of the eleven RTAs are shown in Appendix 3.

The mean value of bilateral imports is 341 million U.S. dollars, with a range spanning from one thousand to 201 billion dollars. The mean value of GDP is 286 billion dollars, with a range spanning from 21 million to 11 trillion dollars. The mean value of per capita GDP for importing countries is 6,000 dollars, with a range spanning from 83 to 48,000 dollars. The average value of distance is 4,589 miles, with a range spanning from 55 miles (Bahrain and Qatar) to 12,351 miles (Guyana and Indonesia). Country-pair observations with a common land border represent 2.7 per cent of the sample; those with a shared language 21.4 per cent; those with a common colonizer 8 per cent; those with a shared colonial relationship 2.3 per cent; those with a common currency 0.9 per cent; and those belonging to the same RTA 2.6 per cent. Table 1 shows descriptive statistics for the three RTA dummy variables for the 11 separate agreements. Sample averages for these dummies tend to be relatively low for ASEAN7 (read ASEAN with 7 members), CARCOM 11, NAFTA2, and EU9, and relatively high for SPARTECA, EU12 and E15, with the averages reflecting the size and time length of RTA.

[Table 1 goes about here]

EMPIRICAL FINDINGS

Estimates of (2), with both fixed and random country-pair effects and fixed year effects, are reported in Table 2. The R squares are high by the standards of the GE equations estimated in the literature but are comparable to those reported by Carrère (2006, Table 2). Most coefficients, with the exception of those involving RTA dummies, are statistically significant at the 1 per cent level. In the fixed effects model, the impact of income on bilateral imports is in line with prediction, but the impact of per capita income is not. Time-invariant dummy variables are made redundant by the estimation of the fixed effects model. The alternative of random country-pair

effects passes the Breusch and Pagan (1980) LM test and the Hausman (1978) test that the fixed effects model is not better than the random effects model. Therefore, we will concentrate on the random effects model for the remainder of our discussion.

The estimated αs of the random effects model of equation (2) appear to be in line with those reported in the literature. The per capita income variable has the predicted sign, in contrast to the fixed model. The size of the elasticity of bilateral imports with respect to income is less than one; the elasticity with respect to distance is numerically larger than one and confirms to be a powerful force in the gravity equation; geographical proximity and cultural affinity variables enhance trade. Countries that share a common currency do not trade any more than those that have different currencies (the coefficient of common currency is not different from zero at the 10 per cent significance level). This result may be surprising given that Rose (2000) has reported that countries with a common currency trade three times as much as countries with different currencies (and fluctuating exchange rates). However, Rose's (2000) finding has been met with skepticism from the start; see the comments to Rose by Persson (2001). From the viewpoint of this paper, the serious problem with Rose's GE equation is the omission of multilateral trade factors. Baldwin and Taglioni (2006) focus on Rose's finding to demonstrate the distortion that such an omission can create. To check on this point, when we estimated (2) with fixed importing-country (instead of fixed country-pair effects) and year effects, the coefficient of common currency turned out to be 0.62 and statistically significant at the 1 per cent level.[8]

[Table 2 goes about here]

Non-expanding RTAs

Having disposed of the general characteristics of the estimated GE, we can now concentrate on

the impact of RTAs on bilateral trade flows. We recall that our sample includes 11 RTAs, of which four have expanded at least once since 1980. We consider first the non-expanding RTAs. SPARTECA is the pristine example of a pure building bloc towards global free trade, with a strong regional trade bias accompanied by expansion of imports and exports to the rest of the world. ANDEAN as well is a building bloc, although weaker than SPARTECA: it has a sizeable regional trade bias and a small import trade diversion.[9] USIS has a positive regional trade bias but also a fully offsetting import trade diversion; there is also some evidence of export trade diversion.[10] Therefore, USIS is a pure trade diversion case and an obstacle to global free trade. The remaining four non-expanding RTAs –ANZCERTA, CACM, MERCOSUR, and PATCRA– show evidence of trade diversion, either on the import or the export side, and no evidence of positive regional trade bias; they too must be classified as stumbling blocs. In sum, of the seven non-expanding RTAs covered by our sample, only two have behaved as building blocs.

Expanding RTAs

Of the remaining four RTAs, ASEAN, CARICOM and the EU have expanded three times during our sample period and NAFTA only once. ASEAN is the perfect example of an expanding building bloc. In each successive enlargement, a strong and statistically very significant positive regional trade bias has been matched by an equally strong expansion of imports and exports to the rest of the world. Judged exclusively in terms of the size of the regional trade bias, ASEAN seems to have peaked with a membership of nine; see Table 3.

The EU can also be considered a building bloc, although weaker than ASEAN. EU9 has a marginally significant positive regional trade bias and has expanded imports and exports to the rest of the world. EU10 is not statistically different from EU9. With both EU12 and EU15, the

regional trade bias remains positive but declines relative to EU9 (see Table 3); import expansion disappears with EU12 and becomes outright trade diversion in EU15; export expansion, although positive, declines progressively in the two enlargement phases. The data seem to suggest that the EU peaked with a membership of ten. One way to interpret this result is that the two enlargements, one from 10 to 12 and the other from 12 to 15, have raised the marginal cost for the EU to remain open to the outside world. The higher costs reflect a larger and more heterogeneous membership, stronger political coalitions against a liberal trade environment, and a unanimity decision rule. Higher marginal costs of maintaining an open environment combined with declining marginal benefits from expanding trade imply a smaller trade club (Fratianni and Pattison, 2001). Clearly, this analysis omits other objectives underlying the expansion of the EU.

NAFTA can also be judged a building bloc, comparable to the EU but weaker than ASEAN. NAFTA2 created no regional trade bias but expanded imports from the rest of the world. NAFTA3 has a strong positive regional trade bias and import expansion but diverts exports from the rest of the world. Overall, trade creation exceeds trade diversion and this RTA makes a contribution to global free trade (see Table 3).

CARICOM is a classic case of an expanding RTA with a positive regional trade bias achieved at the expense of trade with the outside world. Positive internal biases are present in CARICOM11, CARICOM12, and CARICOM13; they disappear in CARICOM14. Export trade diversion appears consistently through all the expansion phases, whereas import expansion is marginally significant in three out of the four bloc sizes. Clearly, CARICOM14 is a stumbling bloc and a worse outcome for global free trade than when it was smaller (see Table 3).

In sum, the four expanding RTAs have done better for global free trade than the seven static RTAs. ASEAN is the champion of building blocs; the EU and NAFTA have, on balance,

contributed to the expansion of world trade; and CARICOM, in its present size, is a stumbling bloc. For ASEAN, the EU, and CARICOM regional trade bias has declined with size (see Table 3).

[Table 3 goes about here]

RTAs AND MNE STRATEGIES

In this section, we link the relative openness of the RTAs to the activities of the MNEs, the intent being of drawing a parallelism between the macro findings and firm-level behavior. Traditional theories of FDI emphasize the critical role of MNEs and the substitutability between FDI and exports. A necessary condition for setting a plant in a foreign country is that trade costs must be sufficiently high to offset the fixed costs of operating two plants; see, among others, Brainard (1997: p.522), Markusen and Venables (2000: p.221) and Neary (2006: p.3). Since trade costs have declined in the era of globalization, traditional theory predicts an expansion of exports relative to FDI. Instead, the two variables have behaved as complements rather than as substitutes. Neary (2006, 2007) provides two theoretical arguments for the complementarity findings. The first is that in response to a liberalization in the foreign country, lower-cost firms in the home country not only expand their exports but also acquire high-cost firms in the foreign country. Thus, exports and FDI outflows move in the same direction. The second, partly related to the first, is that liberalization in the foreign country induces home country's firms to make horizontal investments in the foreign country as an export launching pad. The latter is particularly relevant when the liberalizing foreign country is an RTA, and even more so when the RTA has an active program of creating a single market within its confines (as it is true for the EU).

Combining the "new" theory of FDI with our macro findings on RTAs, we can make the following three predictions about MNEs' strategy. First, the costs borne by a MNE in setting and operating an affiliate abroad depend partly on firm-specific attributes (FSAs), partly on industry specific characteristics and partly on whether the host country belongs to an RTA. FSAs such as firm size, R&D intensity, advertising intensity, price competitiveness, leverage, and market growth have been identified in the literature as important characteristics that affect MNE performance: see, among others, Christophe (1997), Kim and Lyn (1987), Lu and Beamish (2004), and Morck and Yeung (1991). Other things the same, foreign activities of MNEs will be higher the higher the levels of these FSAs. Second, a MNE, after accounting for FSAs and country specific effects, will expand its activities in the member countries of its own RTA in preference to expanding activities in non-member countries. This preference will rise the larger the size of the RTA (market size) and the more liberal is the RTA environment. Buckley et al. note that RTAs provide an opportunity to enjoy the advantages of native and adopted home market of RTAs. We call this strategy the regionalization strategy. Third, distance weakens the strength of FSAs, a result that mirrors the effect of distance on exports. This puts a severe constraint on a globalization strategy, as has been evidenced by Rugman and Verbeke (2004) and Ghemawhat (2007). It follows that the MNE's propensity to expand operations in culturally, economically and institutionally different and more physically distant countries, for a given level of openness, will be, smaller than the propensity to expand in its own RTA.

To test these predictions, we run the following panel regression

$$(3) \qquad y_{ijt} = \gamma_0 + \sum_{z=1}^{6} \gamma_z FSA_{izt} + \sum_{z=7}^{12} \gamma_z RTA * FSA_{izt} + \gamma_{13} MKTSIZE_{jt} + \gamma_{14} RTA_{it} + \gamma_{15} NAFTA + \gamma_{16} EU15 + \gamma_{17} EU25 + \gamma_{18} ASEAN + \gamma_t + \delta_{ijt},$$

where y_{ijt} denotes the share of sales or share of assets at time *t* located in the *j*th RTA (either the inside RTA or outside RTA) of the *i*th firm; FSA is a vector that includes the six firm-specific attributes mentioned above; MKTSIZE is the relative size of the market; RTA is a dummy that is equal to one if the firm is headquartered in an RTA member country and zero otherwise; NAFTA, EU15, and EU25 are dummies that are equal to one if the firm is headquartered in a member country of the specific RTA and zero otherwise; γ_t is a year fixed effect common to all MNEs' shares; and δ_{ijt} is the sum of a fixed industry effect and a residual error term.

The selected firms originating from NAFTA, EU, and three non-RTA countries – Norway, Switzerland, and Turkey– are part of the largest 500 firms listed in the *Fortune Global 500* and comparable number of public firms originating ASEAN countries.[11] Shares of sales and shares of assets in the inside RTA and the outside RTAs were collected from the annual reports of each firm for the period 2000 - 2006. The source of FSAs is Compustat Global. The source of RTA-level characteristics is the World Development Indicators of the World Bank. Because of incomplete FSA data, our final sample has 120 firms and about 500 observations. Observations vary according to the dependent variables; in general, 25% of the observations are from ASEAN firms, 45% from EU firms, 20% from NAFTA firms, and 10% from non-RTA country firms. More details on the data are available in Appendix 4, which shows the precise empirical definition of the variables in (3), and in Appendix 5, which presents summary statistics and the correlation matrix.

Estimates of (3) are displayed in Table 4. The single most important finding is the corroboration that a RTA provides a favorable environment for the MNE to pursue a regionalization strategy. The RTA coefficient, in the first column of Table 4, is positive, very

statistically significant and economically relevant. MNEs from RTA countries have a four-percentage point higher sales ratio in the rest of their own RTA than MNEs from non-RTA countries; and the result appears to be homogeneous with respect to the three RTAs in the sample. Looking at the findings from the asset ratio (column three of Table 4), the RTA regionalization is corroborated only for NAFTA MNEs, and it is economically much weaker than for the sales ratio. The second most important finding is that MNEs from RTAs do not expand in other RTAs relative to non-RTA MNEs. In fact, the RTA coefficient of column two of the table suggests that MNEs from RTA countries have almost a two-percentage point lower sales ratio in "outside" RTAs than non-RTA MNEs. This result is not homogeneous. RTAs can be ranked as follows in terms of access: EU15 is preferred to EU25 and ASEAN, and these three are preferred to NAFTA.[12] The ranking is broadly consistent with our macro findings. The assets ratio regressions are in line with the sales ratio regressions. The other significant findings of Table 4 pertain to the relevance of FSAs in determining the external expansion strategy of MNEs. Firm size, R&D intensity, and leverage appear to be positive attributes for external expansion, and in half of the cases interact negatively with the RTA dummy. Strong FSAs, in particular firm size for sales, lead MNEs to expand beyond RTA boundaries. The other FSAs do not emerge as statically significant drivers. In sum, firm-level behavior points to a strong RTA regionalization strategy.

[Insert Table 4 about here]

CONCLUSIONS AND DISCUSSION

Two main conclusions emerge from this paper, one "macro" and one "micro." The macro conclusion is that RTAs have produced a mixed record with respect to the important issue of

whether they enhance or hamper freer trade in the world. The micro conclusion is that the RTA environment has fostered a regionalization strategy of MNEs.

On the macro findings, we recall that seven of the eleven RTAs considered in this paper have kept a constant membership and four have enlarged at least once during our sample period. In the first group, only ANDEAN and SPARTECA have behaved as building blocs; the remaining five have diverted trade against outside countries with little or no trade creation inside the RTA. The four expanding RTAs have a much better record as building blocs, with ASEAN being the undisputed champion. The smaller EUs have also behaved like ASEAN, but the larger EU15 has diverted imports against the outside world. On balance, the EU has made a positive contribution to the expansion of world trade. A similar assessment holds for NAFTA. The smaller NAFTA showed no evidence of trade diversion against the rest of the world, although it did not expand trade among members. The enlarged NAFTA has produced large regional trade bias but in part at the expense of diverting exports against the outside world. CARICOM, of the four expanding RTAs, has the weakest record as a building bloc. The current size of CARICOM is clearly a stumbling bloc.

The evidence presented in the paper has some bearing on the optimal size of the RTA. Judged exclusively on the ability to create trade within the bloc, three out of the four expanding RTAs –ASEAN, the EU and CARICOM– have already peaked. But regional trade bias is only part of the story. ASEAN has remained a very open club towards the rest of the world through all its enlargement phases. The other three RTAs, on the other hand, have diverted trade against the rest of the world to different degrees. The EU and NAFTA divert trade in the last round of expansion and CARICOM have diverted trade consistently through all expansion phases. While it is difficult to predict what future enlargements may bring, we should keep in mind that as size

increases heterogeneity of membership rises as well, and with it the cost of achieving and maintaining an open trade environment, especially if decision rules are based on unanimity. The upshot is that expanding sizes, within the intermediate range, may not only reduce regional trade bias but also external openness.

Our study has focused on the relationship between RTA size and trade expansion. To the extent that countries form new RTAs or join existing ones for other reasons –such as security or political issues– we would not expect a predictable relationship between size and openness. Indeed, political economy considerations complicate matters in the sense that import trade-diverting RTAs may be more politically acceptable than trade-creating RTAs because the former do not hurt domestic industry, whereas the latter do by replacing domestic production with production located in the members' countries (Krishna 1998).

The micro finding that the RTA environment has fostered the multinational enterprise's regionalization strategy is consistent with a growing body of evidence uncovered in the IB literature. The limits to globalization may stem from the rising costs the MNE faces as adaptation takes place in more distant locations. A host of factors may contribute to these costs, economic as well as cultural. Indeed, it is tempting to draw the similarity between the role of distance on trade flows and the role of distance on the propensity to adapt by the MNE. This topic is worthy of further research. Another aspect of the research that needs more empirical work has to do with the type of environment that best suits the MNE. Our regionalization results appear to be consistent with the MNE being more capable of exploiting markets' similarities than differences. The newer theory of FDI, with its emphasis on horizontal FDI serving as an export platform for a larger area, stresses similarities. Yet, there may be large profit opportunities by exploiting differences across industries. The data set, unfortunately, did not permit to discriminate between

horizontal and non-horizontal foreign assets, a prerequisite in determining the best economic environment of the MNE. It will be part of our future research agenda. Our work has measured MNE performance either by shares of sales or shares of assets in host RTAs relative to total sales or assets, and not by relative profitability. What needs to be ascertained is whether relative sales or relative assets are good proxies of relative rates of return on capital; otherwise, the MNE is trading off one for the other.

The power of the home RTA in influencing the regionalization strategy of the RTA-based MNE can also be seen by the higher propensity of non-RTA MNEs to expand in other RTAs. This could be due to the strong comparative advantage that the MNE develops in expanding in the home RTA, perhaps precluding the development of those firm-specific resources that make a MNE truly global. Future work, both theoretical and empirical, will have to consider what firm-level resources alter the regional propensity of the MNE. The institutional perspective (e.g., DiMaggio & Powell, 1983) suggests that home RTAs provide relatively similar institutional settings that enhance organizational legitimacy without imposing the burden of substantive changes in MNEs' structures and processes. Other approaches can give insights on how MNEs gain internalization benefits in the home RTA market, such as the eclectic paradigm (Dunning, 1981) and internalization theory (Rugman, 1981).

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Table 1
Descriptive statistics of regional trade agreement dummy variables

Variable	Mean	Standard Deviation	Variable	Mean	Standard Deviation
ANDEAN: Same-RTA	0.0015	0.0385	CARICOM11: Same-RTA	0.0005	0.0213
Export	0.0266	0.1609	Export	0.0036	0.0597
Import	0.0256	0.1578	Import	0.0041	0.0641
ANZCERTA: Same-RTA	0.0002	0.0140	CARICOM12: Same-RTA	0.0018	0.0421
Export	0.0224	0.1479	Export	0.0142	0.1182
Import	0.0187	0.1354	Import	0.0178	0.1321
CACM: Same-RTA	0.0012	0.0347	CARICOM13: Same-RTA	0.0005	0.0221
Export	0.0186	0.1350	Export	0.0038	0.0614
Import	0.0180	0.1329	Import	0.0050	0.0703
MERCOSUR: Same-RTA	0.0007	0.0258	CARICOM14: Same-RTA	0.0012	0.0350
Export	0.0202	0.1407	Export	0.0095	0.0971
Import	0.0172	0.1300	Import	0.0125	0.1111
PATCRA: Same-RTA	0.0002	0.0149	NAFTA2: Same-RTA	0.0000	0.0068
Export	0.0174	0.1308	Export	0.0058	0.0763
Import	0.0158	0.1247	Import	0.0057	0.0752
SPARTECA: Same-RTA	0.0026	0.0508	NAFTA3: Same-RTA	0.0003	0.0167
Export	0.0335	0.1799	Export	0.0162	0.1263
Import	0.0321	0.1763	Import	0.0160	0.1255
USIS: Same-RTA	0.0002	0.0129	EU9: Same-RTA	0.0002	0.0140
Export	0.0182	0.1336	Export	0.0039	0.0621
Import	0.0168	0.1284	Import	0.0037	0.0604
ASEAN6: Same-RTA	0.0014	0.0373	EU10: Same-RTA	0.0013	0.0360
Export	0.0333	0.1794	Export	0.0217	0.1455
Import	0.0285	0.1665	Import	0.0208	0.1428
ASEAN7: Same-RTA	0.0002	0.0136	EU12: Same-RTA	0.0038	0.0612
Export	0.0049	0.0700	Export	0.0488	0.2155
Import	0.0046	0.0673	Import	0.0467	0.2109
ASEAN9: Same-RTA	0.0003	0.0175	EU15: Same-RTA	0.0074	0.0854
Export	0.0058	0.0757	Export	0.0664	0.2491
Import	0.0050	0.0705	Import	0.0621	0.2414
ASEAN10: Same-RTA	0.0010	0.0322			
Export	0.0179	0.1327			
Import	0.0140	0.1176			

Notes: See text for the descriptive statistics of other variables.

Table 2
Estimates of the impact of regional trade agreements on bilateral imports

	Bilateral Country Pair & Year Fixed Effects	Bilateral Country Pair Random & Year Fixed Effects
Intercept	-40.1091***	-22.2509***
Log of nominal GDP	1.0211***	0.8160***
Log of nominal per capita GDP	-0.4450***	0.0280***
Log of distance	NA	-1.1406***
Common border	NA	0.5081***
Common language	NA	0.3904***
Common colonizer	NA	0.3566***
Colonial relationship	NA	1.7811***
Common currency	0.0780	0.0869
ANDEAN: Same-RTA	0.6649***	0.7923***
Export	0.0327	-0.0254
Import	0.0476	-0.0881**
ANZCERTA: Same-RTA	0.0176	-0.2229
Export	0.0054	-0.0522***
Import	-0.0175	-0.2158**
CACM: Same-RTA	-0.2685*	-0.0752
Export	-0.1911*	-0.2398***
Import	0.2255***	0.1570***
MERCOSUR: Same-RTA	0.0190	0.0156
Export	-0.2321***	-0.2032***
Import	0.3762***	0.2093***
PATCRA: Same-RTA	NA	0.6362
Export	NA	0.1106
Import	NA	-0.2557*
SPARTECA: Same-RTA	-0.1326	1.8082***
Export	-0.1192	0.3505***
Import	-0.1048	0.3087***
USIS: Same-RTA	0.0930	0.2407
Export	-0.1457**	-0.1121*
Import	-0.2144***	-0.2347***
ASEAN6: Same-RTA	1.4035***	1.7463***
Export	0.9585***	0.4900***
Import	0.4486***	0.8826***
ASEAN7: Same-RTA	1.7090***	1.8627***
Export	1.3207***	1.1767***
Import	0.8388***	0.7903***
ASEAN9: Same-RTA	1.7132***	1.9402***
Export	1.4432***	1.3621***
Import	0.4824***	0.4812***
ASEAN10: Same-RTA	0.9970***	1.2012***
Export	1.3112***	1.2126***
Import	0.1997†	0.1930**
CARICOM11: Same-RTA	-0.1733	1.0683***
Export	-0.4268***	-0.2496**
Import	-0.1077	0.1505*

CARICOM12: Same-RTA	-0.2919	0.8647***
Export	-0.5506***	-0.3677***
Import	-0.0742	0.1578**
CARICOM13: Same-RTA	-0.0997	0.9548***
Export	-0.6843***	-0.5619***
Import	-0.0427	0.1046†
CARICOM14: Same-RTA	-0.7832***	0.1045
Export	-0.4699***	-0.3530***
Import	-0.0324	0.0839†
NAFTA2: Same-RTA	0.3327	0.3757
Export	-0.0470	0.0061
Import	0.1673***	0.1749**
NAFTA3: Same-RTA	0.6825**	0.7044**
Export	-0.2228***	-0.1792***
Import	0.2639***	0.2471***
EU9: Same-RTA	0.0940	0.4591*
Export	-0.0333	0.2974***
Import	0.2103***	0.4033***
EU10: Same-RTA	0.3404**	0.7781***
Export	0.0574	0.4221***
Import	0.1143**	0.3411***
EU12: Same-RTA	0.3394***	0.4998***
Export	-0.0159	0.2413***
Import	-0.0792*	0.0422
EU15: Same-RTA	0.2848***	0.3516***
Export	-0.1804***	0.0468†
Import	-0.1636***	-0.0720**
F-Test for Fixed Effects	Bilateral Country Pair Fixed Effects F(15653,199760)= 15.24	
Breusch and Pagan LM Test for Random Effects		χ^2=3.7e+05 P> χ^2=0.0 (Do not reject Random Effects)
Hausman Test for Model Selection		χ^2=0.00 P> χ^2=1.00 (Fixed effects model is not better than random effects model)
R-square	0.8299	0.8265
Number of obs.	215,000	215,000

Notes: † if p < 0.10, * if p < 0.05, ** if p < 0.01, *** if p < 0.001. NA stands for not applicable. Year fixed effects and bilateral country pair fixed (random) effects are estimated but not reported. Standard errors not reported.

Table 3
Trade creation and trade diversion effects of regional trade agreements based on random effects model

	ASEAN 6	ASEAN 7	ASEAN 9	ASEAN 10
Same-RTA	1.75***	1.86***	1.94***	1.20***
Export	0.49***	1.18***	1.36***	1.21***
Import	0.88***	0.79***	0.48***	0.19**
Test (P> χ^2)				
Same-RTA after expansion = before expansion [a]	NA	0.62	0.79	0.00
Export = Import [b]	0.00	0.00	0.00	0.00

	EU9	EU10	EU12	EU15
Same-RTA	0.46*	0.78***	0.50***	0.35***
Export	0.30***	0.42***	0.24***	0.05†
Import	0.40***	0.34***	0.04	-0.07**
Test (P> χ^2)				
Same-RTA after expansion = before expansion [a]	NA	0.17	0.01	0.03
Export = Import [b]	0.17	0.07	0.00	0.00

	NAFTA2	NAFTA3
Same-RTA	0.38	0.70**
Export	0.01	-0.18***
Import	0.18**	0.25***
Test (P> χ^2)		
Same-RTA after expansion = before expansion [a]	NA	0.52
Export = Import [b]	0.02	0.00

	CARICOM11	CARICOM12	CARICOM13	CARICOM14
Same-RTA	1.07***	0.87***	0.96***	0.11
Export	-0.25**	-0.37***	-0.56***	-0.35***
Import	0.15*	0.16**	0.11†	0.08†
Test (P> χ^2)				
Same-RTA after expansion = before expansion [a]	NA	0.21	0.57	0.00
Export = Import [b]	0.00	0.00	0.00	0.00

	SPARTECA	ANDEAN	MERCOSUR	CACM	ANZCERTA	PATCRA	USIS
Same-RTA	1.81***	0.79***	0.02	-0.08	-0.22	0.64	0.24
Export	0.35***	-0.03	-0.20***	-0.24***	-0.05***	0.11	-0.11*
Import	0.31***	-0.09**	0.21***	0.16***	-0.22**	-0.26*	-0.24***
Test (P> χ^2)							
Export = Import [b]	0.68	0.20	0.00	0.00	0.07	0.04	0.07

Notes: See notes in Table 2. [a] Test for equality of regional trade bias coefficients before and after expansion of RTA. P-values indicate probabilities of the chi-square that the coefficients are different from each other. [b] Test for equality of coefficients of export and import trade diversion. Rejection means that country's trade orientation differs between exports and imports.

Table 4
MNEs' strategic focus and regional trade agreements

	Sales Strategic Focus		Assets Strategic Focus	
	Inside RTA Countries	Outside RTA Countries	Inside RTA Countries	Outside RTA Countries
Firm Size	2.187**	-0.488	0.728	0.212
(log of total sales)	(0.001)	(0.220)	(0.312)	(0.640)
R&D Intensity	0.134	0.214**	-0.098	-0.067
(R&D exp./total assets)	(0.120)	(0.007)	(0.328)	(0.471)
Advertising Intensity	-0.367***	0.340***	0.195*	-0.124
(Adv. exp./total assets)	(0.000)	(0.000)	(0.026)	(0.156)
Competitiveness	-0.316	-0.317	-0.832†	-0.785*
(Learner index)	(0.937)	(0.338)	(0.083)	(0.042)
Leverage	2.751***	0.808*	-0.545	0.136
(Debt ratio)	(0.000)	(0.027)	(0.319)	(0.770)
Expected Growth	0.198	-0.087	0.273	0.591**
(Growth in 5 years)	(0.272)	(0.583)	(0.218)	(0.007)
Inside RTA MKTSIZE	0.801		1.060†	
(% share of GDP)	(0.108)		(0.068)	
Outside RTA MKTSIZE		1.093*		1.172
(% share of GDP)		(0.013)		(0.000)
RTA	4.129***	-1.761*	1.364	-1.124
(Regional Trade Agreements)	(0.000)	(0.017)	(0.218)	(0.240)
Firm Size	-3.680***	1.795**	-1.805	0.958
* RTA	(0.000)	(0.008)	(0.106)	(0.216)
R&D Intensity	-0.161†	0.128	0.160	-0.064
* RTA	(0.083)	(0.132)	(0.150)	(0.533)
Advertising Intensity	0.270**	-0.125†	-0.327**	0.348***
* RTA	(0.001)	(0.091)	(0.001)	(0.000)
Competitiveness	-0.185	0.304	0.576	0.772†
* RTA	(0.646)	(0.371)	(0.237)	(0.052)
Leverage	-3.020***	-0.739*	0.203	0.195
* RTA	(0.000)	(0.000)	(0.714)	(0.680)
Expected Growth	-0.278	0.114	-0.327	-0.701*
* RTA	(0.201)	(0.577)	(0.222)	(0.011)
NAFTA	0.123	-0.339***	0.442***	-0.508***
	(0.240)	(0.000)	(0.000)	(0.000)
EU15	0.240	0.590†	0.280	0.134
	(0.544)	(0.096)	(0.531)	(0.831)
EU25	0.242	0.467	0.240	0.103
	(0.521)	(0.179)	(0.593)	(0.906)
ASEAN	NA	NA	NA	NA
R-square	0.5948	0.5157	0.5118	0.3944
Number of obs.	451	554	414	495

Notes: Reported values are standardized coefficients and P-values are in the parentheses. † if $p < 0.10$, * if $p < 0.05$, ** if $p < 0.01$, *** if $p < 0.001$. Intercept and year and industry fixed effects are estimated but not reported. Standard errors are also not reported. The coefficient of ASEAN is dropped due to multicollinearity. The sample consists of 120 MNEs (but varies across dependent variables) from ASEAN, EU, NAFTA, and three non-RTA countries–Norway, Switzerland and Turkey–.

Appendix 1
Macro-level data description

Variables	Descriptions	Data Sources	**Units**
Bilateral imports	Log of nominal bilateral imports	World Trade Analyzer[a]	Log of 1000 US dollar
Log of nominal GDP	Log of the product of nominal GDPs.	World Development Indicator[b]	Log of dollar
Log of nominal per capita GDP	Log of the product of nominal per capita GDPs.	World Development Indicator[b]	Log of dollar
Log of distance	Log of distance between trading partners	World Factbook[c]	Log of mile
Common border	If two countries share a common border, Common border = 1, otherwise 0.	World Factbook[c]	Dummy variable.
Common language	If two countries share same main language, Common language = 1, otherwise 0.	World Factbook[c]	Dummy variable.
Common colonizer	If two countries had same colonizer, Common colonizer = 1, otherwise 0.	World Factbook[c]	Dummy variable.
Colonial relationship	If two countries were involved in a colonial relationship with each other, Colonial relationship = 1, otherwise 0.	World Factbook[c]	Dummy variable.
Common currency	If two countries share the same currency or a unit exchange rate, Common currency = 1, otherwise 0.	IMF[d]	Dummy variable.
Same-RTA (11 RTAs)	If two countries belong to the same RTA in the year of observation, Same-RTA = 1, otherwise 0; see Appendix 3 for RTA list.	WTO[e]	Dummy variable.
Export-RTA	If exporting country belongs to a RTA and importing does not, Export-RTA = 1, otherwise 0.	WTO[e]	Dummy variable.
Import-RTA	If importing country belongs to a RTA and exporting country does not, Import-RTA = 1, otherwise 0.	WTO[e]	Dummy variable.

Notes:
[a] "World Trade Analyzer" (WTA) has been assembled and managed by Statistics Canada. Information of the data is available at http://www.statcan.ca/bsolc/english/bsolc?catno=65F0016XCB (last accessed on 2007.8.26).
[b] The source for nominal GDP is World Bank's "World Development Indicators". When data are unavailable from World Bank, missing observations are filled from the "Penn World Table" and IMF's "International Financial Statistics".
[c] "World Factbook", CIA; https://www.cia.gov/library/publications/the-world-factbook/index.html (last accessed on 2007.8.26).
[d] The basic source for currency unions is the IMF's "Schedule of Par Values" and issues of the IMF's "Annual Report on Exchange Rate Arrangements and Exchange Restrictions". Data are supplemented by the yearly "Statesman's Year Book".
[e] The data available at http://www.wto.org/english/tratop_e/region_e/region_e.htm (last accessed on 2007.8.26).

Appendix 2
Country list

ALBANIA	DOMINICAN RP	KUWAIT	RWANDA
ALGERIA	ECUADOR	LAOS P.DEM.R	SAUDI ARABIA
ANGOLA	EGYPT	LIBERIA	SENEGAL
ARGENTINA	EL SALVADOR	LIBYA	SERVIA & MONTE.
AUSTRALIA	EQ. GUINEA	MADAGASCAR	SEYCHELLES
AUSTRIA	ETHIOPIA	MALAWI	SIERRA LEONE
BAHAMAS	FIJI	MALAYSIA	SINGAPORE
BAHRAIN	FINLAND	MALDIVES	SLOVAK RP
BANGLADESH	FRANCE	MALI	SOLOMON ISLDS
BARBADOS	GABON	MALTA	SOMALIA
BELGIUM-LUX.	GAMBIA	MAURITANIA	SOUTH AFRICA
BELIZE	GERMANY	MAURITIUS	SPAIN
BENIN	GHANA	MEXICO	SRI LANKA
BERMUDA	GREECE	MONGOLIA	ST KITTS NEV
BHUTAN	GUATEMALA	MOROCCO	SUDAN
BOLIVIA	GUINEA	MOZAMBIQUE	SURINAME
BRAZIL	GUINEA-BISSAU	NEPAL	SWEDEN
BULGARIA	GUYANA	NETHERLANDS	SWITZERLAND
BURKINA FASO	HAITI	NEW ZEALAND	SYRN ARAB RP
BURUNDI	HONDURAS	NICARAGUA	TANZANIA
CAMBODIA	HONG KONG	NIGER	THAILAND
CAMEROON	HUNGARY	NIGERIA	TOGO
CANADA	ICELAND	NORWAY	TRINIDAD TBG
CENTRAL AFR. REP.	INDIA	OMAN	TUNISIA
CHAD	INDONESIA	PAKISTAN	TURKEY
CHILE	IRAN	PANAMA	UGANDA
CHINA	IRAQ	PAPUA N.GUINEA	UK
COLOMBIA	IRELAND	PARAGUAY	UNTD ARAB EM
COMOROS	ISRAEL	PERU	URUGUAY
CONGO	ITALY	PHILIPPINES	USA
CONGO DEM. REP.	JAMAICA	POLAND	VENEZUELA
COSTA RICA	JAPAN	PORTUGAL	VIETNAM
COTE D'IVOIRE	JORDAN	QATAR	YEMEN
CYPRUS	KENYA	REUNION	ZAMBIA
DENMARK	KIRIBATI	ROMANIA	ZIMBABWE
DJIBOUTI	KOREA RP	RUSSIA	

Notes: RUSSIA includes former USSR before 1989, SLOVAKIA includes former Czechoslovakia before 1993, and SERVIA AND MONTENEGRO includes former Yugoslavia before 1992.

Appendix 3
Eleven regional trade agreements in the sample

Name	Country	Year of entry
European Union	Belgium	58
	France	58
	Germany	58
	Italy	58
	Luxembourg	58
	Netherlands	58
	Denmark	73.1.1
	Ireland	73.1.1
	United Kingdom	73.1.1
	Greece	81.1.1
	Portugal	86.1.1
	Spain	86.1.1
	Austria	95.1.1.
	Sweden	95.1.1.
	Finland	95.1.1.
US-IS	US	85.8.19.
	Israel	85.8.19.
NAFTA	US	89.1.1.
	Mexico	94.1.1.
	Canada	89.1.1.
CARICOM	Antigua and Barbuda	73.8.1.
(Montserrat)	Bahamas	83.7.4.
	Barbados	73.8.1.
	Belize	73.8.1.
	Dominica	73.8.1.
	Grenada	73.8.1.
	Guyana	73.8.1.
	Haiti	98.7.4.
	Jamaica	73.8.1.
	St.Kitts and Nevis	73.8.1.
	St.Lucia	73.8.1.
	St.Vincent and the Grenadines	73.8.1.
	Surinam	95.7.4.
	Trinidad Tobago	73.8.1.
PATCRA	Australia	77.2.1.
	Papua N. Guinea	77.2.1.
ANZCERTA	Australia	83.1.1
	New Zealand	83.1.1.
CACM	Costa Rica	63~69, 91~
	El Salvador	61.10.12~69, 91~
	Guatemala	61.10.12~69, 91~
	Honduras	61.10.12~69, 91~
	Nicaragua	61.10.12~69, 91~
MERCOSUR	Argentina	91.2.17.
	Brazil	91.2.17.
	Paraguay	91.2.17.
	Uruguay	91.2.17.

ASEAN (Brunei)	Philippines Indonesia Malaysia Singapore Thailand Vietnam People's Democratic Republic Laos Burma Cambodia	67.8.8. 67.8.8. 67.8.8. 67.8.8. 67.8.8. 95.7.28. 97.7.23. 97.7.23. 99.4.30.
SPARTECA (Cook, Marshall, Micronesia, Nauru Niue Tuvalu)	Ausrailia New Zealand Fiji Kiribati Papua N. Guinea Solomon Islands Tonga Vanuatu Samoa	81.1.1. 81.1.1. 81.1.1. 81.1.1. 81.1.1. 81.1.1. 81.1.1. 81.1.1. 81.1.1.
ANDEAN	Bolivia Colombia Ecuador Peru Venezuela	88.5.24. 88.5.24. 88.5.24. 88.5.24. 88.5.24.

Source: Official website of World Trade Organization (WTO) and individual RTAs.
Notes: Counties shown in parentheses below RTA names are member countries for which we do not have bilateral import data. CACM was suspended in 1970-1990.

Appendix 4
Firm-level data description

Variable	Description	Data Source	Units
Inside RTA sale share (%)	Ratio of firm's sales in RTA countries other than the country of origin to total sales (%).	Annual Reports[a]	Ratio
Outside RTA sale share (%)	Ratio of firm's sales in RTA countries outside the RTA of origin (%).	Annual Reports[a]	Ratio
Inside RTA asset share (%)	Ratio of firm's assets in RTA countries other than the country of origin to total assets (%).	Annual Reports[a]	Ratio
Outside RTA asset share (%)	Ratio of firm's assets in RTA countries outside the RTA of origin (%).	Annual Reports[a]	Ratio
Firm Size	Log of firms' sales.	Compustat Global & Emerging Market[b]	Log of US dollars
R&D Intensity	Ratio of firm's R&D expenditures to total assets.	Compustat Global & Emerging Market	Ratio
Advertising Intensity	Ratio of firm's advertising expenditures to total assets.	Compustat Global & Emerging Market	Ratio
Competitiveness	Firm's (Sales – operating expenses)/ sales.	Compustat Global & Emerging Market	
Leverage	Firm's debt to total assets	Compustat Global & Emerging Market	Ratio
Expected growth	Firm's $(sales_t / sales_{t-10})^{1/10}$.	Compustat Global & Emerging Market	Growth rate
Inside RTA MKTSIZE (%)	Ratio of Inside RTA's GDP (excluding country of origin) to world GDP (%).	World Development Indicators[c]	Ratio
Outside RTA MKTSIZE (%)	Ratio of Outside RTAs' GDP to world GDP (%).	World Development Indicators[c]	Ratio

Notes:
[a] Data collected from annual reports of 120 MNEs domiciled in three RTAs –ASEAN, the EU, and NAFTA– and three non-EU countries –Norway, Switzerland, and Turkey–. The reports cover the period 2000-2006.
[b] The data sets are available from Standard and Poor's.
[c] See Appendix 1 for source.

Appendix 5
Summary statistics and correlation matrix of firm-level data

	Mean (S.D.)	1.	2.	3,	4.	5.	6.	7.	8.	9.	10.	11.
1. Inside RTA sale share (%)	21.2 (18.8)											
2. Outside RTA sale share (%)	42.0 (21.7)	0.13										
3. Inside RTA asset share (%)	15.4 (20.3)	0.77	0.08									
4. Outside RTA asset share (%)	36.2 (21.6)	0.07	0.77	-0.04								
5. Firm Size	9.23 (2.16)	0.00	0.10	0.10	0.19							
6. R&D Intensity	0.04 (0.06)	-0.05	0.32	-0.04	-0.08	0.14						
7. Adv. Intensity	0.12 (0.13)	0.25	0.24	0.23	0.20	-0.21	0.06					
8. Competitiveness	0.13 (0.12)	-0.25	-0.12	-0.23	-0.11	0.07	0.08	-0.29				
9. Leverage	0.82 (0.94)	0.31	0.04	0.33	0.03	0.33	-0.05	0.11	-0.04			
10. Expected growth	1.06 (0.38)	-0.12	0.01	-0.14	0.03	0.05	-0.02	-0.08	0.03	-0.10		
11. Inside RTA MKTSIZE (%)	27.0 (22.9)	0.56	0.19	0.55	0.19	0.22	-0.06	0.09	-0.11	0.61	-0.10	
12. Outside RTA MKTSIZE (%)	70.7 (23.0)	-0.55	-0.19	-0.55	-0.19	-0.24	0.05	-0.08	0.10	-0.61	0.10	-0.99

[1] It should be noted that some are bilateral and of little importance for trade flows (Pomfret, 2006: p.42).

[2] The terminology of building and stumbling blocs was first introduced by Bhagwati (1991). For relevant literature on this topic, see Section 7 in Panagariya (2000).

[3] Many political economy models of RTAs emphasize trade diversion; see Panagariya (2000).

[4] With homothetic preferences, consumers with different incomes but facing the same prices demand goods in the same proportions.

[5] The third dummy permits to distinguish intra-bloc export increases from RTA-induced export increases occurring at the expense of exports to nonmember countries. Welfare is better measured by nonmembers' imports or bloc exports that by nonmembers' exports or bloc imports; see Soloaga and Winters (pages 5 and 6).

[6] It should be noted that country pair fixed (random) effects and year fixed effects provide a more flexible error term structure (i.e. $u_{ijt} = h_{ij} + z_t + \varepsilon_{ijt}$) than Bikker's (i.e., $u_{ij} = v_i + w_j + \varepsilon_{ij}$; p.327, notations have been adjusted to compare two models.).

[7] Frankel (1997: p.134-136) also reports no significant difference between the "exogenous" specification and a specification with the lagged dependent variable, which is the simplest way to control for possible endogeneity.

[8] Regression results are not shown but are available upon request. Similar findings are reported by Barldwin and Taglioni (2006).

[9] The export trade diversion effect is not statistically significant at the 10 per cent.

[10] The export trade diversion effect is significant at the 10 per cent.

[11] The list of firms is available upon request.

[12] Note that the coefficient of ASEAN, which is dropped because of multicollinearity, is equal to the RTA coefficient.