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Regional Integration and the Location of FDI

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Abstract*

This paper studies the impact of regional integration agreements (RIAs) on the location of foreign direct investment (FDI), using data on bilateral outward FDI stocks from the OECD *International Direct Investment Statistics*. The dataset covers FDI from 20 source countries, all of them from the OECD, to 60 host countries, from 1982 through 1999. Using panel data analysis with country-pair fixed effects, we find that common membership in an RIA with a source country increases FDI from that source by around 27 percent. Countries that are more open, and whose factor proportions differ more from those in the source country are likely to benefit more, as they tend to receive FDI of the *vertical* variety, which responds more favorably to integration. We also find that the increase in the size of the market associated with regional integration initiatives contributes to attract more FDI to the RIA as a whole. However, only the countries in the RIA that offer a more attractive overall environment for FDI are likely to be winners in this game. Finally, we also find evidence of a small FDI diversion effect. Our results suggest that regional integration, on average, contributes to attracting FDI, but the benefits are unlikely to be distributed evenly.

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1. Introduction

Over the last couple of decades, we have seen an increase in the number and depth of regional integration agreements (RIA) around the world. Indeed, the proliferation of trade agreements is quite widespread. The former European Economic Community has evolved into a single market (EU) and has recently adopted a common currency, while other non-EU European countries have formed free trade areas with the EU or are presently considering accession. Likewise, countries in Southeast Asia agreed to form the ASEAN Free Trade Area. The Americas have been no exception to this trend. A number of regional integration agreements have been either created (e.g., Mercosur, NAFTA) or strengthened (Comunidad Andina) in the 1990s. Some countries such as Mexico and Chile have been very active in forming bilateral trade agreements with countries both in the continent and in other regions. In addition, the Free Trade Area of the Americas, currently under negotiation, is supposed to create a free trade area from Alaska to Tierra del Fuego by the year 2005.

At the same time, the world has been experiencing a dramatic surge in the flows of Foreign Direct Investment (FDI), which have increased by a factor of 10 over the last two decades. By comparison, trade has expanded only by a factor of 2 during the same period. The surge in FDI involves flows toward both developed and developing countries. In fact, Foreign Direct Investment has recently become the main source of foreign financing for emerging markets. In light of these developments, the role of regional integration agreements as a determinant of the location of FDI has become an increasingly relevant issue for emerging economies. This is the subject that we explore in this paper. In particular, we will look at the effects of regional integration on the stocks of bilateral FDI in the context of a gravity model, using data from the OECD *International Direct Investment Statistics*.

The potential effect of the FTAA on Latin American countries is a useful starting point to explain the relevance of our work. What effect should we expect from the FTAA in terms of the evolution of FDI from the US and Canada to Latin American countries? How will the creation of the FTAA affect FDI from the rest of the world to the region? What are the implications of FTAA for a country such as Mexico whose preferential access to the US may be diluted? Would the effect be similar across countries, or should we expect to see winners and losers? What determines whether a particular country wins or loses FDI as a result of the FTAA? These are some of the issues that we address in the paper. While the prospect of the FTAA is what

motivates us to carry out this study, our focus is certainly broader, as we look at the effects of regional integration agreements in general, without concentrating on a particular group of countries.

A difficulty in assessing the role of regional integration agreements on FDI is that there are many different channels through which RIAs could potentially have an impact on the location of FDI. Moreover, not all of these channels go in the same direction. The impact could depend, for example, on the reasons that bring about foreign investment in a particular country. For instance, a firm may invest abroad in order to exploit a highly protected domestic market, thus serving through sales of a foreign affiliate a market that it could serve through trade only at a high cost. Alternatively, it may invest abroad following a strategy of international vertical integration, exploiting differences in comparative advantage for different stages of production of a given good. As we will see, depending on the motive for foreign investment, the formation of trading blocs may have completely different implications for the location of FDI.

The impact of RIAs on bilateral FDI will also depend on whether the source country is a member of the RIA or an outsider. For example, NAFTA could potentially affect flows of FDI to Mexico from both the US and Germany, although through different channels. The impact of RIAs may also depend on other characteristics of the host countries that make them relatively more or less attractive than their RIA partners as a potential location for foreign investment. Thus, while an RIA may increase FDI flows to the region, these new flows are likely to be directed to only a few FDI-friendly countries.

In what follows, we will discuss in detail a number of channels through which RIA could affect the location of FDI. For simplicity, we will focus on those channels that we think should be the most important ones, leaving aside others that we believe should have only second-order effects.[1] In addition to clarifying the main effects at play, this conceptual discussion should help lay down a roadmap for the empirical exercises that follow. Before doing this, however, it is useful to provide a brief stylized description of the different approaches to foreign investment that have been preeminent in the FDI literature: the horizontal and vertical models of multinational integration.[2]

[1] For a more exhaustive discussion of the channels through which RIAs could affect FDI, see Blomström and Kokko (1997).
[2] This characterization and the discussion below follow Markusen and Maskus (2001).

2. Varieties of Multinational Activity: Vertical and Horizontal Models of FDI

The first models of vertical FDI were proposed by Helpman (1984) and Helpman and Krugman (1985). In these models, a single-product firm has a corporate sector (which may produce management services and R&D) and a production facility that can be separated geographically at no cost. If, as assumed in those models, the corporate sector is more capital intensive than the production sector, firms localize each "stage" of production to take advantage of the differences in factor prices, with the production facility producing for both the domestic market and the source country market (trade costs are assumed away).[3] An implication of this model is that one would only expect to observe vertical FDI taking place between countries with sufficiently different factor endowments, so as to ensure that factor prices do not equalize.[4] Conversely, no FDI would be observed between countries with similar endowments, an implication that is obviously at odds with the international experience. While in its stylized version the vertical model incorporates just the firm's headquarters and a single plant, the concept can be extended to encompass all forms of multinational activity involving vertical integration across international borders.

While in the vertical model a multinational is a single plant firm with headquarters located in a different country, in the horizontal model multinationals are firms with multiple production facilities, one of which is located together with the company's headquarters.[5] Each production facility supplies the domestic market. A key assumption in the horizontal model is the presence of economies of scale at the level of the firm (associated with the fact that they do not need multiple corporate sectors), which is the source of the advantage of multinational firms over domestic ones. Given that firm-level scale economies exist, multinational activity in the horizontal model depends on the interplay between trade costs and plant-level economies of scale.[6] In the absence of trade costs, there would be no reason for multinational production, since firms could concentrate their production in the home country, taking advantage of economies of scale and serving the foreign market through trade. As trade costs increase, multinational production arises as long as plant-level economies of scale are not too high. In this

[3] By trade costs we mean both trade barriers and other transaction costs associated to trade, such as transportation costs.
[4] For this reason, Brainard (1993) characterizes vertical FDI as the factor-proportions approach to FDI.
[5] For models of the horizontal variety, see Markusen (1984), and Markusen and Venables (1998), among others.
[6] Due to this interplay between scale economies and trade costs, Brainard (1993) has labeled this type of model the "proximity-concentration" approach.

sense, one can think of horizontal multinational activity as a "tariff-jumping" strategy. Contrary to what follows from the vertical model, multinational activity in this case will tend to arise among countries with similar factor proportions, as differences in factor endowments will lead to differences in production costs that may defeat the tariff jumping strategy. Similarly, due to the presence of plant-level economies of scale, for a given level of trade costs, multinational activity is more likely to arise between countries of similar size.[7]

In an attempt to bring the vertical and horizontal approaches into a unified framework Markusen (1997) and Markusen and Maskus (2001) developed the so-called knowledge-capital model. In a two-country, two-factor, two-good setup, three types of firms can arise: horizontal firms with plants in both countries and headquarters in one, vertical firms with a plant in one country and headquarters in the other, and national firms with plant and headquarters in one country that serve the other through trade. In addition, firm- and plant-level scale economies are assumed for the more skilled labor-intensive good. As before, differences in factor endowment would tend to favor vertical FDI, whereas firm-level economies combined with trade costs would favor horizontal FDI. Thus, the positive impact of a decline in bilateral trade costs (for example, as a result of an RIA) on FDI would be inversely proportional to differences in factor endowments.[8]

The previous discussion appears to suggest that we should expect North-South FDI to be of the vertical variety (and as such fostered by the decline in trade costs due to an RIA), while North-North FDI should be largely of the horizontal type (negatively influenced by a decline in trade costs).[9] This is not as clear-cut as it may seem, however. Countries in the North tend to have much lower trade barriers, at least in the manufacturing sector. As discussed above, the absence of important trade barriers weakens the case for horizontal FDI among developed countries. Conversely, horizontal FDI can arise between North and South countries, even when their factor endowments are very different, as long as trade barriers are high enough. The automobile industry in Latin American countries during the period of import substitution (or

[7] Otherwise, a domestic firm in a large country will have an advantage in serving the smaller country through trade (since trade costs are incurred on a small trade volume), compared to a multinational that has to bear the fixed costs of producing in two locations.
[8] See Carr, Markusen and Maskus (2001).
[9] We concentrate on North-North and North-South FDI. Our database only includes developed countries as a source of FDI, which prevents us from analyzing the South-South case.

even today, within the protected environment of Mercosur) is a perfect example of horizontal FDI.[10]

Why Should Regional Integration Agreements Matter for FDI?

Having discussed the main stylized models of multinational activity, we are now ready to address the channels through which RIAs can affect FDI. Since the problem is a complex one with several relevant dimensions (vertical vs. horizontal FDI, insiders vs. outsiders in an FTA, etc.) it is convenient to choose one of these dimensions as a way to organize the discussion. Rather than starting from the vertical/horizontal distinction, we will organize the discussion starting from the insider/outsider nature of the source country in the host country's RIA. The reason is that the bilateral character of our data allows us to discriminate directly between these two cases. It is not as straightforward to identify the motives for investment with any precision, although some characteristics of the source and host countries can provide useful hints about the main motivation for FDI flows between each country pair. Throughout the discussion, we have to keep in mind a limitation of our FDI database: It only includes FDI from OECD countries to a variety of host countries (both OECD and developing). Therefore, we will not be able to look specifically at FDI between developing countries.

Effects on FDI from Members of the Same RIA

The effects on FDI between member countries will clearly depend on the nature of FDI. Horizontal FDI is a substitute for international trade. To the extent that FDI is of the horizontal, "tariff-jumping" nature, the formation of RIAs that reduce trade barriers in a preferential way should discourage FDI among members. When FDI is of the purest single-plant vertical variety, the firm produces the good in the labor-abundant country for both markets. This involves exporting back to the source country, so in this case FDI and trade are complements.[11] Since barriers to trade discourage vertical FDI by increasing the transaction costs involved in a vertical

[10] Moreover, all the models discussed assume that firms produce a homogenous good. However, a large portion of FDI among similarly endowed North countries may not be purely horizontal in nature, but rather involve multiple-plant firms producing different *varieties* of a final good in different locations. Unlike horizontal FDI, this type of FDI would be enhanced by a decline in trade costs.

[11] This also applies to broader definitions of vertical FDI, i.e., when the firm has a strategy of international vertical specialization, by which different stages of production are located in different countries, taking advantage of differences in factor prices.

integration strategy, a reduction of trade barriers will therefore encourage vertical FDI.[12] In the case of regional integration agreements, in which the reduction of trade barriers is preferential, we should expect the impact to be even larger, since transaction costs are reduced only for member countries, making them relatively more attractive as locations for investment. A priori, FDI between a particular pair of countries is likely to comprise both horizontal and vertical motives. Accordingly, the question of the effects on aggregate FDI of common membership in an FTA, then, is an empirical one.

In addition, the launch of an FTA often entails efforts to further reduce transaction costs *that specifically affect cross-border investment*, by liberalizing capital flows, homogenizing legal norms, setting up institutions to handle cross-border disputes, etc. To the extent that RIAs include these explicit investment provisions, we should expect them to have a positive effect on FDI, independently of its nature.

Effects on FDI from Source Countries Outside the RIA

The increase in the size of the market can generate new investment in activities subject to economies of scale, which might not have been profitable before the RIA was formed. This effect is obviously relevant for the case of horizontal FDI. Mercosur, for example, may have become a more attractive market, making it more worthwhile to "jump" the common external tariff instead of supplying each of the individual countries through trade. Naturally, the external tariff has to be high enough for this channel to be relevant. The formation of the RIA can also facilitate vertical integration within the region, of production by multinational corporations based outside the region.[13] Thus, whatever the motive for FDI, this *extended market effect* should result in more FDI for the RIA as a whole.[14] But within the RIA, there may be winners and losers. We turn to this redistributive effect next.

While extending the market may bring more FDI to the region as a whole, new FDI will certainly not be evenly distributed *within* the RIA. Indeed, even existing FDI stocks in the region may be relocated. For instance, before the RIA is launched, a multinational corporation might

[12] The effect would be similar if the foreign affiliate produces goods to export to the whole world, but imports intermediate inputs from headquarters, or from other foreign affiliates within the area.
[13] Note that this effect can also be present for the case of FDI from source countries within the same RIA.
[14] This effect may be different for different types of RIAs. In particular, when a country from the South forms an RIA with a country from the North, it may become particularly attractive, since it combines some "southern"

have horizontal FDI in all member countries. When barriers to trade within the region are eliminated, the firm may choose to exploit scale economies by concentrating production in a single plant and supplying the rest of the countries through trade. At any rate, through these *redistributive effects*, the extension of the relevant market may bring about winners and losers, generating important political economy dynamics.

A key question, then, is what determines whether a country is a winner or a loser in this game. Even if tariffs are eliminated, as long as other trade costs (such as transportation costs) remain, the size and location of the individual economies may be an important variable in this regard, since plant-level economies may dictate that the firm locate its plant in the larger market or in the one most centrally located so as to minimize the cost of supplying the whole region.[15] The biggest losers could in fact be medium-sized countries, since very small countries would have been supplied by trade anyway, unless their trade barriers were extremely high.[16] Alternatively, a country may be particularly attractive as a destination of FDI due to the quality of its institutions (associated with the rule of law, the regulatory burden, or institutional transparency), the quality of its labor force, its tax treatment of multinationals, or its factor prices, all variables that are important even under the assumption of zero trade costs.[17] These factors should dominate market size in the case of vertical FDI, in which the foreign affiliates produce for the world market.

Effects of RIA by a Source Country

FDI toward host countries can also be affected by RIA activity by a source country, whether or not the host is a partner of the source. If common membership in a regional integration agreement with the source country makes a host country relatively more attractive as a location for FDI (as it does in the vertical model), then such RIA will make non-members relatively less

locational advantages (for example, low wages) with access to a developed market. Production of Volkswagen automobiles in Mexico is a case in point.

[15] In addition, large countries may be relatively more attractive as the size of the domestic market works as insurance against the possibility of a dismantling of the RIA.

[16] As an example, the auto industry in Uruguay was practically undeveloped, even during the years of import substitution industrialization.

[17] See Wei (1997, 2000) and Stein and Daude (2001).

attractive. We call this effect *FDI diversion*, in analogy to Viner's (1950) classic trade diversion concept: FDI from a source to non-partners may decline as the source enters an RIA.[18]

Similar effects would be experienced by a member when the source country enlarges its RIA. Take, for instance, the potential effects on FDI flows from the US to Mexico once the FTAA is established. To the extent that the investment is there to exploit some locational advantages of Mexico, as the preferential access of Mexico to the US becomes *diluted* by the FTAA part of the FDI may be relocated to other new members that may now offer an even better package. This is what we call *FDI dilution*, an effect closely associated with FDI diversion.

3. Empirical Evaluation

Methodology

While there has been some empirical work on the link between integration and FDI, it has been mostly based on case studies, focusing on the European Union, on Mexico following NAFTA, or on Mercosur. As far as we know, there has been no systematic empirical evaluation of the effects of regional integration on FDI for a large sample of countries. The purpose of this section is to contribute to filling this void in the literature.

For this purpose, we use data on bilateral outward FDI stocks from the OECD *International Direct Investment Statistics*. The dataset covers FDI from 20 source countries, all of them from the OECD, to 60 host countries, from 1982 through 1999.[19] One shortcoming of this dataset is that it does not cover FDI between developing countries. Nonetheless, it is the most complete source available for *bilateral* FDI, which is a key ingredient for studying the effects of integration on foreign investment.

Our empirical strategy is loosely based on the gravity model, a standard specification in the empirical literature on the determinants of bilateral trade, which has also been recently used

[18] As in Viner's trade diversion, the formation of an RIA may divert FDI from the most efficient location to a partner. For example, following NAFTA, a US firm may locate in Mexico the production of an intermediate input that it may have otherwise located in Costa Rica in the absence of the preferential access enjoyed by Mexico. In Mexico, this "trade diversion" effect will be combined with all other effects of common membership with the source country. What we call trade diversion in this paper is the loss suffered by Costa Rica, as well as other countries, as a result of the creation of NAFTA. Another example of investment diversion is found in the European Union; see Baldwin, Forslid, and Haaland (1996).

[19] The number of countries included in the regressions above varies according to data availability for the different controls used in each specification.

in the analysis of FDI location.[20] In its simplest formulation, it states that bilateral trade flows (in our case bilateral FDI stocks) depend positively on the product of the GDPs of both economies and negatively on the distance between them. Typical variables added to the simplest gravity specification in the trade literature include GDP per capita, as well as dummies indicating whether the two countries share a common border, a common language, past colonial links, etc.

In this paper, in line with our specific focus on the dynamic effect of the creation of RIAs, we will use a modified version of the standard gravity model that abstracts from pair-specific aspects usually addressed in previous work. Thus time-invariant pair-specific variables such as distance, borders, common language, or colonial links will be subsumed in country pair fixed effects, in order to isolate the dynamic effects and leave out the cross-sectional variation. We believe that the use of country pair fixed effects provides the cleanest benchmark against which to assess the impact of regional integration agreements on FDI.[21] In addition, we include source and host nominal GDP to control for variations in size, and time fixed effects to control for the spectacular increase in FDI over time. Finally, we augment the equation with a number of variables associated with the effects of regional integration discussed above.

The first regional integration variable in our baseline specification is *Same FTA*, a dummy that takes a value of 1 when the source and the host countries belong to the same Free Trade Area. In order to construct this variable, we used the description of existing regional trade agreements included in Frankel, Stein and Wei (1997).[22] This variable captures a combination of channels: tariff-jumping, international vertical integration, and the potential effect of investment provisions on FDI.[23]

[20] See Table 1A in the Appendix. Also See Eaton and Tamura (1994), Frankel and Wei (1997), Wei (1997, 2000), Blonigen and Davis (2000), Stein and Daude (2001) and Levy Yeyati, Panizza and Stein (2001).

[21] To a certain extent, the inclusion of the country pair dummies addresses potential endogeneity problems, which would arise if countries select their RIA partners on the basis of the multinational activity between them. Indeed, as will be shown below, comparison of our results with those obtained from an augmented gravity model appears to indicate that the latter overstates the impact of an FTA.

[22] We did not include as FTAs country pairs that have preferential trade agreements, in which trade barriers among members are reduced but not eliminated. Countries that are part of a customs union are coded as members of the same FTA.

[23] It would have been useful to include an index of depth of investment provisions within different FTAs in order to separate the effect of investment provisions on FDI. To our knowledge, however, such a measure does not exist. Since all our RIAs involving countries in the North contain some investment provisions, a simple dummy variable would not be helpful in identifying these effects.

A second integration variable we use is *Extended Market Host*, which captures the extended market effect discussed in the previous section. This variable is constructed as the log of the joint GDP of all the countries to which the host has tariff-free access due to common membership in an FTA (we include the host's own GDP as well). Following the previous discussion, we expect the coefficient of *Extended Market Host* to be positive, regardless of the motive for FDI.

A third integration variable is *Extended Market Source*. Similarly to *Extended Market Host*, it is measured as the log of the joint GDP of the source country plus all the countries that are FTA partners of the source country. This variable captures the FDI diversion/dilution effects, and we expect its coefficient to have a negative sign, suggesting that FDI to a host country diminishes when firms in the source country have other FTA partners in which to locate their investments.

Hence, our basic specification is as follows:

$$Log\ (1+FDI_{ijt}) = \alpha + \beta_1 Log\ GDP_{jt} + \beta_2 Log\ GDP_{it} + \gamma\ samefta_{ijt} + \quad (1)$$
$$+ \delta_1 Log\ EM_{jt} + \delta_2 Log\ EM_{it} + \mu_{ij} + \psi_t + \varepsilon_{ijt}$$

where FDI_{ij} is the stock of foreign investment of country i in country j, *EM* stands for Extended Market, μ_{ij} is a country pair fixed effect, ψ_t is a year fixed effect, and ε_{ijt} is the error term.

A few methodological points are in order. We use a standard double log specification, which has typically shown the best adjustment to the data in the empirical trade literature using the gravity model. There is, however, a problem in taking logs of our dependent variable. Our dataset includes a large number of observations where FDI stocks are zero, which would be dropped by taking logs. The problem of the zero variables is typical in gravity equations, and it has been dealt with in different ways.

Some authors (see, for example Rose, 2000) simply exclude the observations in which the dependent variable takes a value of zero, for which the log does not exist. A problem with this approach is that those observations do in fact convey important information for the problem at hand, particularly if they tend to be associated with pairs of countries that do not belong to the same FTA, as the empirical results below seem to confirm. For this reason, and given the importance of zero observations in our sample, this strategy could lead to a serious estimation bias.

Eichengreen and Irwin (1995, 1997) have proposed a simple transformation to deal with the problem of zeroes: work with log (1 + *y*), instead of the log of *y*, where *y* is the dependent variable (in their case, bilateral trade). This has the advantage of simplicity, and the coefficients can be interpreted as elasticities, when the values of the dependent variable tend to be large, since in this case log (1 + *y*) is approximately equal to log (*y*).[24] In this paper, we chose as our benchmark a country-pair fixed effect model using the transformation proposed by Eichengreen and Irwin.[25]

Empirical Results

Before presenting the main empirical results regarding the effects of RIA on bilateral FDI stocks, we discuss briefly the effects of the presence of zero values of FDI in the sample and compare the estimated impact of RIAs (in particular our same FTA variable) using different methodologies. Next, we investigate the possible existence of FDI diversion and the extended market effect. Finally, we focus on other factors, such as differences in factor proportions, trade openness and FDI attractiveness, which may control for the nature of FDI between specific country pairs and, as such, affect the impact of our integration variables on the evolution of bilateral FDI.

Nearly 40 percent of our observations have a zero value for the bilateral stock of FDI. Table 1 illustrates how our methodologies for dealing with this problem affect the results. In the first column of Table 1, we estimate equation (1) using as dependent variable the log of FDI. As a result, all zeroes are discarded, reducing the sample to 7,403 observations. The estimated effect of a common FTA membership on the bilateral FDI stock is positive and significant. Column 2 reports a similar regression, this time using as dependent variable the transformation suggested, namely the log of 1 + *FDI* (which we henceforth refer to as our baseline specification). To make the results comparable with those of the first column, we restrict the sample to include only observations with strictly positive values for our dependent variable. The results are virtually identical to those of the first regression. Hence, the proposed transformation does not affect the results in any noticeable way.

[24] Notice that any transformation of the type *LFDI* = log (*x* + *FDI*) with *x* > 0 would do the trick. But *x* = 1 is a natural choice because it yields a fixed point at zero, i.e., log (1+*x*) = *x* at *x* = 0. A different version of this approach, used by Eaton and Tamura (1994) and Wei (2000), uses as dependent variable the log of (*a* + *FDI*), and estimates the value of *a*.

Next, we rerun our baseline specification for the whole sample. As can be seen, the inclusion of zero observations drives up the same FTA coefficient from 0.145 to 0.24, confirming our concern that ignoring these observations might bias the results considerably. Indeed, the exclusion of zero observations introduces an important downward bias in the estimation of the effect of our variable of interest: Since the overall effect of a FTA is positive, it is only natural that individual pairs are more likely to have had zero FDI if they do not share common membership in a FTA.[26]

The benefits of relying on pair fixed effects is apparent from the last column of the table, where we rerun the baseline specification replacing pair dummies by a set of source and host fixed effects and bilateral controls as in a standard augmented gravity model.[27] As expected, the FTA effect changes significantly while the rest of the coefficients are only slightly modified. Since pair effects capture the correlation between RIAs and bilateral FDI for those pairs that share a FTA throughout the period, the within estimate of the FTA dummy only reflects the dynamic impact of joining an FTA. In contrast, in columns 4 and 5, the FTA dummy also captures the cross-section correlation between joining an FTA and having strong FDI flows which, as it turns out, is positive and significant, possibly reflecting reversed causality from financial (and other) links to the likelihood of sharing an FTA.[28] Accordingly, failing to control for this cross-section link may lead to overestimate the size of the FTA effect. The same conclusion applies when we compare column 2 with the results from a gravity equation excluding zero observations (column 5).[29]

Estimates of our baseline specification indicate that joining an FTA, on average, increases bilateral FDI between its members by about 27 percent.[30] This positive effect suggests that any potential loss of FDI due to the tariff-jumping argument is more than offset by other effects that operate in the opposite direction.

This result is also consistent with the signs that we obtain for the extended market effect: A larger extended market of the source country diverts investment toward the members of that

[25] For the sake of comparison we present below the results obtained by excluding zero observations.
[26] Indeed, FTA pairs amounts to 15.8 percent of non-zero observations, but only 3.2 percent of zero observations.
[27] Rose (2000) provides a description of the definitions and sources of the bilateral controls.
[28] The between estimate of the FTA dummy from our baseline specification yields a coefficient of 1.62, significant at 1 percent.
[29] In fact, a similar argument applies to applications of the gravity model to study the impact of trade agreements on bilateral trade flows, where within FTA estimators tend to be substantially below between estimators, and smaller than FTA coefficients obtained using an augmented gravity equation.

extended market.[31] More precisely, an increase of 1 percent in the extended market of the source leads to a slight decline of nearly 0.05 percent in the average FDI stock originating in that country. Conversely, the size of the extended market of the host country has a positive effect on the bilateral FDI stock attracted from the source: the elasticity of bilateral FDI stock with respect to the size of the extended market of the host country is a little over 0.1. While the estimated effects for the host extended market may seem small, the reader should bear in mind that changes in the extended market due to an FTA, for most countries involved, tend to be rather large. For example, when Mexico entered NAFTA its extended market increased by a factor of 18.

Naturally, this is not the complete story, as FDI is in practice driven by many other intervening factors. In the following tables we explore some of these factors.[32] In Table 2, we add two country-specific variables potentially related to inflows of FDI. First, we include a measure of the cumulative value of privatized assets, as privatization of public companies may have induced large and concentrated capital inflows, particularly in developing economies, in recent years. As expected, privatizations are significantly correlated with the stock of FDI, although their inclusion does not alter the results for our variables of interest. It is widely accepted that stable macroeconomic conditions foster foreign investment. Interestingly, when we include the annual inflation rate to proxy for macroeconomic stability, the coefficient is significant and positive, contrary to what we would have expected. Nonetheless, the results for our variables of interest remain unchanged.

In turn, Table 3 explores host- and pair-specific characteristics that may influence the intensity of the FTA effect, to shed some light on its vertical / horizontal nature. In column 2, we introduce the openness of the host country, measured as the ratio of trade to GDP. Since substantial international trade tends to be associated with the presence of lower trade barriers, the variable could be linked to the presence of FDI of the vertical variety.[33] Therefore, the impact of an FTA on FDI should be larger the more open the economy is (alternatively, the more vertical the nature of its FDI). The results confirm this conjecture. While the estimated effect of the same FTA is nearly the same as in the baseline estimation, the interaction with the same FTA dummy is positive and significant: More open economies attract proportionally more FDI when they join

[30] The implied effect of common FTA membership is calculated as exp (0.24) – 1 = 0.27.
[31] The reader should bear in mind that the average market size of host and source are already captured by the pair dummies, while the increase over time in FDI is captured by the time effects
[32] Here, as well as in Table 3, the basic specification (1) is reproduced in the first column for ease of comparison.

an FTA. To illustrate how the impact may vary according to the degree of openness of the host, we report at the bottom of the table the expected FTA effect as well as the minimal and maximal effect (measured at the sample mean of the openness variable, and at its minimal and maximal values).

Next, we interact the same FTA dummy with the source-host absolute difference in capital per worker, as well as with the absolute difference in the proportion of the labor force with complete secondary education, as proxies for relative factor endowments. In line with the results of Carr, Markusen and Maskus (2001), we expect that the more diverse the level of relative factor endowments of a pair of countries (the more vertical the nature of FDI between the two), the larger the effect on FDI of a reduction in bilateral trade costs associated with joining an FTA. Columns 3 and 4 show that the coefficient for the interaction term is positive and significant, confirming our priors.[34] This suggests that the impact on integration may be larger for the case of countries in the South forming RIAs with partners in the North.

Attractiveness: FDI as a Beauty Contest

The previous discussion highlighted the fact that while, on average, we should expect to see an increase in FDI as a consequence of an FTA, the impact might differ critically across the member countries. An alternative and relatively simple way to illustrate the possibility of winners and losers is to distinguish countries by their propensity to attract FDI. Intuitively, the most attractive countries within an FTA will receive the bulk of the increase in FDI. Moreover, given that an FTA allows firms to supply the extended market from a single location, FDI relocation may result in a net decline in FDI stocks in less FDI-friendly economies.

As mentioned in our previous discussion, redistributive effects within a regional bloc may depend on the characteristics that affect the relative attractiveness to foreign investors of the member countries. To measure a country's propensity to attract FDI, we estimate an augmented gravity model, replacing pair dummies by a number of standard bilateral controls, and source and host fixed effects (Table 4), according to the following specification:

[33] In contrast, more open economies should be expected to receive comparatively less horizontal FDI.
[34] The coefficient for same FTA (not interacted) suggests that the impact of integration on countries that have similar endowments is not significant.

$$Log\ (1+FDI_{ijt}) = \alpha + \beta_1 Log\ GDP_{jt} + \beta_2 Log\ GDP_{it} + \gamma\ samefta_{ijt} \quad (2)$$

$$+ \delta_1 Log\ EM_{jt} + \delta_2 Log\ EM_{it} + \theta\ ln(privat_{jt}) + \gamma_1 Log\ D_{ij} + \gamma_2\ Cont_{ij}$$

$$+ \gamma_3 Lang_{ij} + \gamma_4\ Comctry_{ij} + \gamma_5\ Comcol_{ij} + \gamma_6\ Colonial_{ij} + \tau_i + \eta_j + \psi_t + \varepsilon_{ijt}$$

where η_j and τ_i are host and source fixed effects. The cumulative value of privatized assets of the host ($privat_{jt}$) is also included, since otherwise the host effect could be reflecting what is essentially a one-time increase in FDI, unrelated with actual country-specific characteristics.[35] In this way, individual host effects should capture all those time-invariant factors (relative distance to sources, institutions, infrastructure, etc.) that may underscore the country's overall *attractiveness* to FDI. Table 4 reports the results from this equation.

Next, we re-estimated the baseline equation interacting the same FTA dummy with our measure of overall attractiveness. As expected, the estimated effect is positive and significant (Table 5, column 2). Countries that are more attractive to foreign investors may benefit more from entering an FTA than others. Indeed, there may be winners and losers in the integration process. At the bottom of the table we compute the expected effect of joining an FTA, as well as its minimal and maximal impact as a function of the host's attractiveness. As can be seen, countries with very low attractiveness are likely to experience a net decline in FDI stocks.

In contrast, for the case of the impact of the extended market of the host country, the interaction with attractiveness is positive, but not statistically significant (column 3). One could argue, however, that being attractive is a relative concept: if an RIA increases the market readily accessible to their members, the key factor at the time of choosing a location should be *relative attractiveness* within the region, or how a particular RIA member compares with its RIA partners. While there is no obvious way to measure this relative attractiveness, we use the following proxy: We construct a dummy that is one whenever a country displays the highest attractiveness index within an RIA (*relative attractiveness*) and a second dummy that takes a value of one for the rest of the countries that belong to an RIA.[36] The interaction of these

[35] However, the results are basically unchanged if the estimation of host effect is done excluding the privatization variable.

[36] Both dummies take a value of 0 for countries that did not belong to an RIA. If a country belongs to more than one RIA, the most attractive dummy is 1 as long as the country in question is the most attractive in any of the RIAs to which it belongs. Extensive robustness tests yielded comparable results using variations of these measures that included dropping countries with no RIA, assigning 1 to those that do not belong to an RIA and assigning 1 only if the country is the most attractive in all of its RIAs.

dummies with the extended market of the host proved to be positive both for the most attractive countries as well other countries belonging to an RIA, but only significant for the most attractive group. Reassuringly, the impact of both FTAs and the extended market are stable across different specifications.

In sum, RIA and the associated market enlargement have a stronger positive effect on FDI in an FDI-friendly environment. More importantly, unattractive countries may lose FDI as a result of joining an RIA, due to stiffer competition from their more handsome partners.

4. Conclusions

In this paper, we found that regional integration agreements can have a very important effect on foreign direct investment. On average, common membership in an FTA with a source country increases bilateral stocks of FDI by about 27 percent. The increase in the size of the market associated with the formation of RIAs also implies important expected gains (an increase of one percent is associated with an increase in FDI of 0.1 percent). Moreover, these results are in line with the insights provided by the related theoretical literature: the impact of a cut in bilateral trade costs due to the launch of an FTA on FDI is a positive function of the difference in factor endowments of the intervening countries, as well as of the propensity of the recipient country to trade internationally.

This suggests, for example, that a move towards the Free Trade Area of the Americas would in principle considerably bolster North-South FDI flows to Latin America, given the difference in relative endowments and the recent trend to reduce trade barriers in many countries in the region.

However, the study also indicates that reported FDI gains are likely to be distributed unevenly. Our results indicate that, beyond the reported role of openness and factor endowments, the overall attractiveness of a country as a location of FDI plays an important role in determining whether or not it is likely to benefit from integration.

While not much can be done to change the country's location or factor endowments in the short run, other relevant factors are certainly amenable to policy action. Openness is important, since the formation of RIAs increases the incentives for multinational activity of the vertical variety (which takes advantage of differences in factor proportions), but reduces multinational activity of the horizontal variety, which is a substitute for trade. Not only will

openness increase the impact of the RIA on FDI, but it can also more generally change the composition of FDI from horizontal to vertical. Since horizontal FDI sometimes occurs due to the existence of a distortion (high protection), and vertical FDI responds to comparative advantage, it could be argued that, regardless of the impact of openness on total FDI, this shift may improve the benefits a country derives from multinational activity.[37]

Regarding overall attractiveness, previous research points to a number of factors that can play a role in this regard. Wei (1997, 2000), for example, argues that corruption (as well as uncertainty regarding corruption) plays an important role in discouraging FDI. Stein and Daude (2001) show that, more generally, the quality of a country's institutions has an important impact on the success of countries in attracting FDI. This result, moreover, is robust to the use of a variety of institutional variables. These authors also find that the quality of a country's infrastructure, and the tax treatment of foreign corporations also have a significant impact, although the importance of these factors is not as robust as that of institutional quality.

It seems obvious that becoming more attractive to foreign investors by improving the quality of institutions, or that of the infrastructure (or more generally, improving the investment environment) can only be a positive development.[38] Less obvious is the result that the beneficial impact of integration on FDI can be reversed for unattractive countries. At any rate, what exactly a country can do to make itself more appealing is already the subject of ongoing academic research. Our findings should make it a more urgent topic since, as we show, the link between FDI and RIAs hinges largely on the recipient country's ability to appeal to potential investors.

[37] Clearly, this is not the case for non-tradable goods where FDI can only occur in the horizontal form.

[38] The advantages of providing tax incentives are not as obvious since, particularly in the context of regional integration, such a strategy may lead to a competition among the countries in an RIA, which may result in the foreign investors appropriating most of the benefits FDI has to offer. See Fernández-Arias, Hausmann and Stein (2001)

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Table 1. Fixed Effects and OLS Estimation

	(1)	(2)	(3)	(4)	(5)
	FE	FE	FE	OLS	OLS
	Ln(FDI)	Ln(FDI+1) if FDI>0	Ln(FDI+1) All	Ln(FDI+1) if FDI>1	Ln(FDI+1) All
GDP Host	0.439	0.452	0.191	0.434	0.120
	(9.919)***	(11.608)***	(5.864)***	(6.849)***	(2.136)**
GDP Source	1.073	0.830	0.518	0.844	0.499
	(14.626)***	(12.845)***	(7.259)***	(7.618)***	(3.873)***
Extended Market Host	0.067	0.054	0.102	0.086	0.086
	(3.512)***	(3.168)***	(5.684)***	(3.164)***	(2.785)***
Extended Market Source	0.139	0.101	-0.048	0.101	-0.055
	(7.147)***	(5.902)***	(2.730)***	(3.564)***	(1.745)*
Same FTA	**0.155**	**0.145**	**0.239**	**0.285**	**0.472**
	(2.952)***	**(3.133)*****	**(3.983)*****	**(5.627)*****	**(7.231)*****
Distance				-0.918	-1.027
				(37.400)***	(34.775)***
Border				0.298	0.217
				(4.459)***	(2.301)**
Common Language				0.706	0.945
				(13.083)***	(13.189)***
Colonial				1.033	1.316
				(8.627)***	(7.815)***
Constant	-16.807	-13.111	-6.955	-6.104	-0.237
	(15.602)***	(13.819)***	(7.260)***	(4.052)***	(0.141)
Observations	7403	7403	12483	7403	12483
Number of paircode	784	784	1083		
Adjusted R-squared				0.8200	0.7750
R-sq between	0.3987	0.4221	0.5126		
F pair dummies	[62.84]***	[69.94]***	[61.65]***		
F year dummies	[45.94]***	[47.33]***	[42.12]***	[14.85]***	[18.20]***

Absolute value of t statistics in parentheses.

Absolute value of F statistics in square brackets.

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 2. Privatization and Inflation

	(1)	(2)	(3)
GDP Host	0.191	0.180	0.243
	(5.864)***	(5.540)***	(6.546)***
GDP Source	0.518	0.518	0.510
	(7.259)***	(7.288)***	(6.992)***
Extended Market Host	0.102	0.112	0.095
	(5.684)***	(6.234)***	(5.209)***
Extended Market Source	-0.048	-0.051	-0.028
	(2.730)***	(2.905)***	-1.531
Same FTA	**0.2393**	**0.2821**	**0.2712**
	(3.983)***	**(4.703)*****	**(4.562)*****
Privatizations		0.041	0.035
		(9.609)***	(8.105)***
Inflation			0.073
			(2.125)**
Constant	-6.955	-6.917	-7.464
	(7.260)***	(7.249)***	(7.465)***
Observations	12483	12483	11706
Number of paircode	1083	1083	1045
R-sq between	0.5126	0.5072	0.523
F pair dummies	[61.65]***	[61.54]***	[61.84]***
F year dummies	[42.12]***	[40.45]***	[38.08]***

Absolute value of t statistics in parentheses.

Absolute value of F statistics in square brackets.

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 3. Vertical vs. Horizontal FDI

	(1)	(2)	(3)	(4)	(5)	(6)
GDP Host	0.191	0.189	0.350	0.137	0.344	0.133
	(5.864)***	(5.789)***	(7.879)***	(3.374)***	(7.746)***	(3.274)***
GDP Source	0.518	0.515	0.542	0.499	0.537	0.493
	(7.259)***	(7.217)***	(6.616)***	(6.051)***	(6.558)***	(5.991)***
Extended Market Host	0.102	0.104	-0.060	0.112	-0.057	0.114
	(5.684)***	(5.796)***	(2.639)***	(5.718)***	(2.489)**	(5.847)***
Extended Market Source	-0.048	-0.049	0.044	-0.030	0.043	-0.032
	(2.730)***	(2.784)***	(2.128)**	(1.456)	(2.079)**	(1.553)
Same FTA	**0.239**	**-0.345**	**0.130**	**-0.060**	**-0.444**	**-0.702**
	(3.983)***	**(2.222)****	**(1.332)**	**(0.621)**	**(2.613)*****	**(3.953)*****
Same FTA * Average Openness		0.009			0.008	0.009
		(4.079)***			(4.113)***	(4.303)***
Same FTA * Average Abs. Diff. in Capital per worker			0.010		0.011	
			(1.694)*		(1.870)*	
Same FTA * Absolute Difference in Average Percentage of the Labor Force with Secondary School				0.012		0.013
				(2.701)***		(2.999)***
Constant	-6.955	-6.905	-7.672	-6.344	-7.578	-6.245
	(7.260)***	(7.212)***	(6.734)***	(5.629)***	(6.658)***	(5.546)***
Observations	12483	12483	8293	9326	8293	9326
Number of paircode	1083	1083	703	792	703	792
R-sq between	0.5126	0.5162	0.4973	0.4834	0.5092	0.484
F pair dummies	[61.65]***	[61.23]***	[69.37]***	[56.94]***	[68.55]***	[56.37]***
F year dummies	[42.12]***	[42.15]***	[27.82]***	[36.04]***	[27.89]***	[36.18]***
Total Effect of Same FTA (MIN)		-0.197	0.130	-0.059	-0.303	-0.528
Total Effect of Same FTA (MEAN)		0.283	0.292	0.173	0.256	0.252
Total Effect of Same FTA (MAX)		2.876	0.772	0.741	2.279	3.591

Table 3., continued

	(1)	(2)	(3)	(4)	(5)	(6)
Min of Average Openness		16.97			16.97	18.89
Mean of Average Openness		72.25			62.78	75.66
Max of Average Openness		370.25			242.76	370.25
Min of Abs. Diff. in Cap. per worker			0.013		0.01	
Mean of Abs. Diff. in Cap. per worker			16.54		16.54	
Max of Abs. Diff. in Cap. per worker			65.55		65.55	
Min of Abs. Diff. in % Labor Force Secondary school				0.033		0.033
Mean of Abs. Diff. in % Labor Force Secondary school				19.37		19.37
Max. of Abs. Diff. in % Labor Force Secondary school				66.72		66.72

Absolute value of t statistics in parentheses.
Absolute value of F statistics in square brackets.
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 4. Computation of FDI Attractiveness

	(1)
GDP Host	0.105
	(1.926)*
GDP Source	0.491
	(9.551)***
Extended Market Host	0.100
	(3.231)***
Extended Market Source	-0.057
	(1.878)*
Privatizations	0.053
	(7.103)***
Same FTA	**0.505**
	(7.740)***
Distance	-1.027
	(35.281)***
Border	0.209
	(2.228)**
Colonial	1.331
	(7.917)***
Common Language	0.941
	(13.167)***
Constant	12483
	0.887
Observations	12483
Adjusted R-squared	0.8875
F host dummies	[110.89]***
F source dummies	[126.64]***
F year dummies	[35.30]***

Absolute value of t statistics in parentheses.
Absolute value of F statistics in square brackets.
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 5. FDI as a Beauty Contest

	(1)	(2)	(3)	(4)
GDP Host	0.191	0.172	0.171	0.183
	(5.864)***	(5.271)***	(5.237)***	(5.039)***
GDP Source	0.518	0.550	0.549	0.549
	(7.259)***	(7.673)***	(7.663)***	(7.660)***
Extended Market Host	0.102	0.118	0.112	0.080
	(5.684)***	(6.512)***	(5.832)***	(2.258)**
Extended Market Source	-0.048	-0.051	-0.050	-0.050
	(2.730)***	(2.840)***	(2.792)***	(2.794)***
Privatizations	0.239	0.040	0.040	0.040
	(3.983)***	(9.397)***	(9.411)***	(9.384)***
Same FTA		**0.016**	**0.031**	**0.018**
		(0.150)	**(0.295)**	**(0.170)**
Same FTA * Attractiveness Host		0.103	0.097	0.101
		(3.038)***	(2.807)***	(2.965)***
Extended Market Host * Attractiveness Host			0.006	
			(0.932)	
Extended Market Host * Most Attractive Host in a RIA				0.108
				(2.067)**
Extended Market Host * Not Most Attractive Host in a RIA				0.041
				(1.205)
Constant	-6.955	-7.247	-7.311	-7.366
	(7.260)***	(7.543)***	(7.590)***	(7.646)***
Observations	12483	12253	12253	12253
Number of pairs	1083	1064	1064	1064
R-sq between	0.5126	0.5063	0.5672	0.5231
F pair dummies	[61.65]***	60.72	45.06	57.24
F year dummies	[42.12]***	39.71	36.33	39.49
Total Effect of Same FTA (MIN)		-0.133	-0.108	-0.127
Total Effect of Same FTA (MEAN)		0.209	0.213	0.207
Total Effect of Same FTA (MAX)		0.756	0.728	0.742
Total Effect of Extended Market Host (MIN)			0.104	0.079
Total Effect of Extended Market Host (MEAN)			0.123	0.117
Total Effect of Extended Market Host (MAX)			0.155	0.228

Table 5., continued

	(1)	(2)	(3)	(4)
Minimum of Attractiveness		-1.435	-1.435	-1.435
Mean of Attractiveness		1.877	1.876	1.876
Maximum of Attractiveness		7.167	7.166	7.166
Minimum of Most Attractive Host in a RIA				0
Mean of Most Attractive Host in a RIA				0.155
MAX Most Attractive Host in a RIA				1
Minimum of Not Most Attractive Host in a RIA				0
Mean of Not Most Attractive Host in a RIA				0.504
Maximum of Not Most Attractive Host in a RIA				1

Absolute value of t statistics in parentheses
Absolute value of F statistics in square brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Appendix

Table A.1 Free Trade Agreements

FTA	Creation	Members
European Union (EU)	1957	Austria (since 1995), Belgium, Denmark (since 1973), Finland (since 1995), France, Germany, Greece (since 1981), Ireland (since 1973), Italy, Luxembourg, Netherlands, Portugal (since 1986), Spain (since 1986), Sweden (since 1995), United Kingdom (since 1973)
European Free Trade Association (EFTA)	1960	Austria (until 1994), Denmark (until 1972), Finland (1986-1994), Iceland (since 1970), Liechtenstein (since 1991), Norway, Portugal (until 1985), Sweden (until 1994), Switzerland, United Kingdom (until 1972)
European Economic Area (EEA)	1994	All members of the European Union, Iceland, Liechtenstein, Norway
Central European Free Trade Area (CEFTA)	1992	Czech Republic, Hungary, Poland, Slovak Republic, Slovenia (since 1995)
North American Free Trade Agreement (NAFTA)	1989	Canada, USA, Mexico (since 1994)
Mercado Común del Sur (MERCOSUR)	1995	Argentina, Brazil, Paraguay, Uruguay
Andean Community (formerly Andean Pact)	1969	Bolivia, Colombia, Ecuador, Peru, Venezuela
Central American Common Market (CACM)	1959	Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua
Group of Three	1994	Colombia, Mexico, Venezuela
Bolivia-Mexico FTA	1995	Bolivia, Mexico
Association of Southeast Asian Nations FTA (ASEAN)	1992	Brunei, Indonesia, Malaysia, Philippines, Singapore, Thailand, Vietnam (since 1995)
Australia-New Zealand Closer Economic Relations	1983	Australia, New Zealand
South African Custom Union	1910	Botswana, Lesotho, Namibia (since 1990), South Africa, Swaziland

Table A.2. Data Sources

Variable	Source
Privatizations	Chong, Alberto and Florencio López-de-Silanes (2002) "Privatization and Labor Force Restructuring Around the World." Manuscript Yale University (forthcoming NBER)
Inflation	International Monetary Fund. International Financial Statistics
FDI Stock	OECD. 2000. *International Direct Investment Statistics Yearbook*. Paris, France: Organization for Economic Cooperation and Development.
GDP	World Development Indicators
Distance, Border, Common Language and Colonial Links	The World Economic Factbook, CIA website www.cia.gov/cia/publications/factbook/index.html
Trade	International Monetary Fund. International Financial Statistics
Capital per worker	Penn Tables
Percentage of the Labor force with secondary Education	World Development Indicators 2002.