Does Regionalism Increase Foreign Direct Investment? An Empirical Investigation

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Abstract

This paper examines empirically how economic integration, in the form of regionalism, affects the structure of Foreign Direct Investment (FDI). Consistent with the theoretical literature, the evidence suggests that, with the fall of trade costs in an integrated bloc, multinationals are motivated — by improved intra-regional market accessibility and economies of scale — to concentrate their production geographically and supply the other markets by exporting. In particular, regionalism does overall raise U.S. FDI in integrated members, especially in those that belong to more than one Regional Trade Agreement (RTA) or a RTA of many members because of their preferential market access to a large number of markets. However, the impact of regionalism is considerably asymmetric or even contrary within the integrated regions, as multinationals are more concentrated in countries with attractive market size, comparative advantage, and tax policy. Further, regional economic integration significantly stimulates export-platform FDI, which becomes an increasingly prominent component of aggregate FDI.

Key words: regionalism, foreign direct investment, export platform, geographic concentration, hub-and-spoke

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1 Introduction

The proliferation of regionalism in almost every block of the world, initiated to dismantle trade barriers within a region, is reshaping the flows of foreign direct investment. The decline of barriers to trade—granting firms freer market access — weakens one of the original economic logics of multinational firms. In contrast, the role of economies of scale becomes increasingly dominant in their location decisions. Multinational firms are urged to re-consider the tradeoff between proximity to consumers and concentration of production, and re-decide between exports and FDI. In an integrated region such as the European Union, while exporting is now perhaps a less costly strategy for outside firms to supply some markets than establishing separate factories, other member states may become even more attractive FDI destinations and possibly export platforms because of their preferential market access to the entire bloc. The purpose of this paper is therefore to estimate the impact of regional economic integration on U.S. outward foreign direct investment, across and within regional blocs: Does regionalism increase or decrease foreign direct investment? And is export-platform FDI multinationals' response to regionalism?

A volume of seminal theoretical studies, including Motta and Norman (1996), Krugman and Venables (1996), Puga and Venables (1997), and Ekholm, Forslid, and Markusen (2005), has addressed the effect of economic integration on the structure of foreign direct investment. Motta and Norman (1996), in a game theoretical model of FDI, find that the integration of a region causes outside firms to invest in the region and particularly leads to export-platform FDI with the investing firm supplying the majority of the countries in the regional bloc by intra-regional exports. In a two-country two-industry model, Krugman and Venables (1996) show that at lower trade barriers agglomeration force dominates and each industry concentrates in a single location. Puga and Venables (1997) extend the analysis of preferential trade agreement and industrial location to a more complicated trading system, and also find that a fall in trade barriers may lead to agglomeration with some member countries gaining industry at the expense of others.[1] Ekholm, Forslid, and Markusen (2005) similarly show that the formation of a free trade area leads to a rise of export-platform FDI from both inside and outside firms. In all these works, regional economic integration essentially dilutes multinationals' market access motive and highlights the incentive of exploiting economies of scale. Multinationals begin to concentrate their production in favored nations, causing a divergence in countries' share of FDI. The clear predictions yielded by the theoretical literature build a solid analytical foundation for this paper.

In contrast to the significant theoretical work, little empirical analysis has systematically examined foreign direct investment in the context of regionalism. As one of the pioneer works,

[1] The latter two papers both consider a vertical linkage between industries in their model, which further amplifies the agglomerative effect of economic integration.

Barrel and Pain (1999) explore the effect of the Single Market Programme implemented in the European Union (EU), and find that the removal of trade barriers within the EU has changed the permeability of national borders and raised FDI in all the four major European economies. Feinberg and Keane (2001) consider the trade liberalization between the United States and Canada, and show that a lower U.S. tariff raises the exports of Canada-based U.S. multinationals back to their home country. A recent study, Tekin-Koru and Waldkirch (2005), investigates specifically how the North American Free Trade Agreement (NAFTA) alters the pattern of FDI in North America. They find that after NAFTA U.S. increases its FDI in Mexico while other countries begin to use Mexico as an export platform. These studies, each examining a particular regional trade agreement, have cast a light on the potential effect of regionalism on FDI. However, despite of these efforts how FDI is restructured geographically across and within the integrated blocs is far from answered.

This paper contributes to the literature in the following dimensions. First, this paper takes a first step in examining all the existing Regional Trade Agreements (during the period of 1986 and 1999)[2] and providing a systematic analysis of how regionalism overall affects foreign direct investment.[3] The paper takes into account the complexity emerged in the landscape of regionalism. RTAs not only vary substantially in their size (e.g., the European Union versus the MERCOSUR) but often overlap with one another (e.g., Canada has a preferential trade agreement respectively with Mexico and Israel while the latter two did not establish one until 2001). Puga and Venables (1997) labels the latter possibility as a hub-and-spoke arrangement, which increasingly arises as more countries decide to adopt regionalism as a path to free trade.[4] Firms located in a member state of a bigger integrated bloc are able to export to a larger number of countries at the preferential tariff rate; similarly, firms located in a hub country (e.g., Canada) are entitled with a lower tariff when accessing all the spike countries (e.g., Mexico and Israel) but the benefit of the lower tariff does not necessarily apply between spike nations. As a result, countries that belong to a large RTA and/or more than one RTA are more favored by firms. This intuitive prediction has not been examined empirically and constitutes an important hypothesis here.

Second, this paper considers a broader definition of regionalism, including: Regional Trade Agreement (RTA) which deals with tariffs and quotas, and harmonization of product stan-

[2] Because the Bureau of Economic Analysis switches from the SIC industry classification to the NAICE code in 1999 when collecting data on U.S. multinationals' activities, the data of affiliate sales at the SIC 2-digit industry level is only available until 1999.

[3] As each of the previous empirical studies focuses on one particular RTA, either the European Union or the NAFTA, other regional trade blocs like the MERCOSUR and ASEAN have not been studied for their effect on the inflow of FDI, and little light has been shed on how members of different RTAs may differ in their abilities of attracting FDI.

[4] Another example is that the European Free Trade Association (EFTA) separately reached a Free Trade Agreement (FTA) with Turkey and Israel in 1993, though there did not exist a FTA between Turkey and Israel until 1998.

dards which tackles technical barriers to trade. As traditional barriers to trade like tariffs and quotas have significantly declined in the past decades, product standards have risen to become an effective trade policy tool to block foreign competition. Recognizing the prevalence of this dimension of trade barriers, the European Union decides to harmonize the initially diverse national standards (in selected industries) in order to advance to a deeper integration. After harmonization, firms are allowed to serve the entire participating region by conforming to one common standard (rather than different standards set by each market which create scale diseconomies and segment the markets).[5] Both schemes of regionalism may achieve improved market accessibility through essentially reducing, respectively, variable and fixed trade costs.[6] However, they differ considerably in their treatment of inside versus outside firms. In contrast to RTA which only grants the benefits of a lower tariff to firms located within the bloc, standards harmonization applies to firms of all locations. Thus, while firms are motivated to concentrate their production geographically in both cases, harmonization allows firms to do so in their home country and yet equally enjoy the benefits. This paper thus investigates and distinguishes the impacts of these two schemes of regional economic integration.

Third, and perhaps most importantly, a centerpiece of this paper's hypotheses is that economic integration presents firms an opportunity of improving economies of scale, thereby motivating multinational firms to geographically concentrate their FDI and switch their entry strategy from FDI to exports in certain markets. To test this, the paper proceeds in various routes. After examining the average effect of regionalism across all locations, it investigates how the effect may vary or contrast across the member countries of an integrated bloc. While there may be an overall increase in the FDI inflow toward an integrated region, the impact varies by the host country's market size, comparative advantage, tax policy, and trade cost. Within the integrated bloc, attractive host countries may gain multinational firms at the expense of the others. Further, whether multinational firms have indeed turned from dispersed to export-platform FDI is also addressed in the paper. Regionalism, which improves intra-regional market accessibility, naturally encourages more intra-regional trade and hence concentrated FDI in certain locations with the aim of serving the rest of the region through exports. While foreseen in the theoretical literature, including Motta and Norman (1996), Krugman and Venables (1996), the divergent effect on FDI of regionalism as well as the rise of export-platform investment discussed above have been mostly ignored in the empirical literature.

[5] Baldwin (2000) discusses in great details the approaches that have been adopted to address technical barriers to trade, including the harmonization of standards. Maskus and Wilson (2001) offer a comprehensive review of related studies.

[6] A RTA lowers tariff for intra-regional firms, which is considered as a variable cost of trade. Harmonization of standards, on the other hand, enables firms to supply products that meet the common standard to all member states, which to a great extent simplifies the market-specific fixed cost, such as the redesign cost of meeting each individual standard. See Baldwin (2000) for a formulation of standards harmonization.

A knowledge-capital model is adopted as this paper's underlying econometric framework. This model considers two motives as the causes of FDI. First, firms may choose to supply each market through local production and avoid international trade cost, which is labeled as the market access motive. If the advantage of local access to the market outweighs the advantage of scale production, firms expand horizontally across countries of similar factor abundance. Markusen and Venables (2000), for example, offer a model of horizontal FDI. Second, when the production process consists of various separable stages which require different factor intensities, firms may choose to locate each stage in a country where the factor used intensively in that stage is abundant. This is referred as the comparative advantage motive. Krugman and Venables (1996), for instance, consider the vertical case of FDI. The voluminous empirical literature on the knowledge-capital model includes representative studies such as Carr, Markusen, and Maskus (2001), Markusen and Maskus (2001), Markusen and Maskus (1999), Brainard (1997), and Yeaple (2003). Both the market access (see, e.g., Brainard (1997)) and the comparative advantage motive (see, e.g., Yeaple (2003)) have been respectively confirmed. While built on this literature, this paper introduces the consideration of regionalism and investigates how the weakening of the market access motive within an integrating region alters U.S. multinationals' FDI decisions.

Using the Heckman (1979) selection model, the paper shows, while a Regional Trade Agreement on average raises both the probability of entry by U.S. multinationals and the volume of FDI inflow to an integrated bloc, the regional agreement that addresses technical barriers to trade does not necessarily prompt multinationals' entry but does pose a positive impact on the FDI volume. Countries that belong to more than RTA or a RTA of a large size are especially favored by multinationals. The impact of regionalism is also significantly asymmetric and even contrary across countries of different market size, comparative advantage, and other characteristics. In particular, RTA members with attractive market size, low corporate tax, and high transport cost become the locations in which multinationals concentrate their production, whereas the least attractive RTA members could even lose FDI after economic integration. Countries with high income, unskilled labor force, and high tariff benefit more from standards harmonization in attracting FDI. Further, as it becomes less costly to supply some markets by exporting than local production, multinationals are indeed found to switch from a dispersed-FDI strategy to export-platform FDI within integrated regions. Export-platform FDI is more likely to rise in RTA members with preferential market access to a large number of countries.

The rest of the paper is organized as follows. Section 2 discusses in details the econometric framework and hypotheses of the paper. Section 3 describes the data employed for the analysis, and section 4 presents the empirical results. Finally, the paper concludes with section 5.

2 Econometric Framework

The empirical framework adopted in this paper is aimed to analyze how the rising regionalism affects FDI and multinationals' choices of host countries as (i) production locations and further (ii) export platforms. In the literature of knowledge-capital model, both theory and empirical work have suggested that the locational choices by multinationals are affected by multinationals' market access and comparative advantage motives. However, most of the empirical work has ignored the impact of regionalism on multinationals' geographic pattern. First, the establishment of a regional trade bloc, in the form of either Customs Union or Free Trade Agreement, significantly reduces traditional trade barriers such as tariff within the bloc. However, since the benefits of lowered trade cost are exclusive to inside firms, outside firms are motivated to move their production to the integrated region, leading to a potential increase in the FDI. Further, as intra-regional trade cost falls, firms' incentive to concentrate their production geographically and serve the region through exports rises. Second, a deeper integration has also been undertaken in the best-known region of all, the European Union, to deal with technical barriers to trade. As all member states decide to harmonize their initially different national standards, firms are now able to access the entire region by conforming to the common standards. The virtue of this regional integration approach is that firms are allowed to reduce the multiple fixed costs of production which originally incurred to meet the diverse national standards. However, in contrast to the first type of regional trade bloc, the economies of scale from standards harmonization are open to firms of all production locations. Thus, outside firms would not have to relocate to the region to enjoy the benefits, though firms' incentive to concentrate their production is similarly augmented.

To first examine the impact of the above two schemes of regional economic integration on multinationals' activities, the paper estimates an FDI equation which incorporates the consideration of regionalism into the conventional knowledge-capital model:

$$FDI_{jkt} = \alpha + \beta \cdot Host_{jkt} + \gamma \cdot Industry_{kt} + \theta \cdot Regionalism_{jkt} + \varepsilon_{jkt}. \tag{1}$$

In the above equation, the dependent variable, FDI, is a measure of the scale of U.S. outward FDI, the subscript j indexes the host country, k industry and t year. The explanatory variables consist of three categories. First, $Host_{jt}$ is a vector of host-country specific variables, characterized as

$$\beta \cdot Host_{jkt} = \beta_1 Market\_size_{jt} + \beta_2 Prod\_cost_{jkt} + \beta_3 Tax_{jt} + \beta_4 Trade\_cost_{jkt}, \tag{2}$$

which includes *market size*, *production cost*, *corporate tax*, and *trade cost* (between the host country and multinationals' home country). A host country with a bigger market size—

represented by either a higher income or a larger population—should lead to not only a greater amount of FDI by each multinational but also a larger number of firms, thereby raising the total amount of FDI more than proportionally ($\beta_1 > 1$). By contrast, a higher level of production cost should be associated with a lower level of FDI by multinationals ($\beta_2 < 0$). Since the actual production cost in the host country is not observed, a country's relative *human capital* abundance is considered as a proxy and reflects its comparative advantage. A relatively skilled-labor abundant country should be the production location of industries with high skilled-labor intensity, whereas a relatively skilled-labor scarce country should specialize in industries with low skilled-labor intensity. Hence, the effect of a host country's human capital abundance on multinationals' activities varies across industries dependent on their *skilled-labor intensity* (which is included as an industry-specific variable as discussed below). The estimated coefficients on the proxied variables answer whether it is skilled-labor or unskilled-labor abundant countries where multinationals tend to locate and whether the host country's comparative advantage is consistent with the industry's skilled-labor intensity. A host country's corporate tax rate is another operation cost for multinationals and would be negatively associated with FDI ($\beta_3 < 0$). Finally, while in a horizontal FDI model multinationals may be more inclined to increase their outward FDI when a high level of trade cost, tariff or shipping cost between their home and host country is present, labelled as market access or trade-cost jumping motive ($\beta_4 < 0$), in a vertical FDI model multinationals' incentive to move their assembly production abroad may be discouraged when it is costly to export their intermediate inputs to the host countries ($\beta_4 > 0$). Hence, the prediction on the effect of trade cost is ambiguous.

The second category of regressors represents industry specific characteristics,

$$\gamma \cdot Industry_{kt} = \gamma_1 Skilled\_labor\_intensity_{kt} + \gamma_2 Plant\_scale_{kt}, \tag{3}$$

which includes *skilled-labor intensity*, and *plant scale*. A negative coefficient on skilled-labor intensity ($\gamma_1 < 0$) indicates that multinationals are keener to locate unskilled-labor intensive production abroad. Further, it is expected that the level of FDI in a country are decreasing in the scale of a production plant ($\gamma_2 < 0$) which reflects the cost of operating an additional production facility.

Third, $Regionalism_{jkt}$ is a vector of variables representing a country's status in regional economic integration:

$$\theta \cdot Regionalism_{jkt} = \theta_1 RTA_{jt} + \theta_2 Harmonization_{jkt}. \tag{4}$$

A lower level of tariff exclusive to firms located within the region, thanks to a Regional Trade Agreement (RTA), may increase the FDI flow to the member states ($\theta_1 > 0$) because of

improved intra-regional market accessibility. However, since standards harmonization extends to firms from both inside and outside the region, it is possible that multinationals choose to concentrate their production elsewhere other than the integrating region, such as their home country. Thus, its impact on FDI in the regional bloc is ambiguous. However, both types of economic integration spur geographically concentrated production, which in turn indicates different impact across host countries: While certain countries attract more multinationals, the others, however, may actually see a decrease in multinationals' activities. To identify what types of host countries and industries experience an increase of multinationals' activities, the interaction terms between the vector $Regionalism_{jkt}$ and the host-country/industry variables are also established and estimated.

However, as predicted by Motta and Norman (1996), a direct impact of regional economic integration, through improved intra-regional market accessibility, shall be the increase of export-platform FDI: Instead of producing locally in each market to avoid tariff or shipping cost, firms now may find less costly to produce in fewer locations and supply the other markets through exports. Hence, some member states may be selected as export platforms to serve third countries and gain industries at the expense of the others. The next equation examines how multinationals' propensity to adopt countries as their export platforms is affected by regional agreements:

$$Export\text{-}Platform\_FDI_{jkt} = \alpha' + \beta' \cdot Host_{jkt} + \gamma' \cdot Industry_{kt} + \theta' \cdot Regionalism_{jkt} + \varepsilon'_{jkt}. \quad (5)$$

$Export\text{-}Platform\_FDI_{jkt}$ measures the level or share of export-platform FDI, while $Host_{jkt}$, $Industry_{kt}$, and $Regionalism_{jkt}$ are already defined above. The effects of these regressors on the level of export-platform FDI are expected to be qualitatively similar to those in equation (1) on total FDI. However, the effect of a host country's market size on the share of export-platform FDI may possibly be negative when the market size of the host country is considerably greater than multinationals' export markets.

It is noteworthy to point out that U.S. multinationals do not always incur positive FDI or export-platform FDI in the sample countries, because the decision of entering a foreign market as a multinational firm is clearly endogenous. An OLS model, equally treating positive and zero valued observations, would assume any control variable has an identical impact on the existence and volume of FDI. A classical model that enables the investigation of these two decisions of FDI in two separate stages is the Heckman (1979) two-step consistent estimator. Hence, the paper adopts both the OLS and Heckman selection model in the empirical analysis. An additional note needs to be addressed on the residual terms, ε_{jkt} and ε'_{ikt}. These residual terms may reflect a wide range of omitted variables, such as unobserved industry-specific production cost in the home country and the size of the geographic region the host country belongs to, all of which may be correlated with the existing regressors. Therefore, industry,

year and region fixed effects are adopted throughout the paper.[7]

3 Data

Two dependent variables are considered to examine FDI: the level of sales by multinational affiliates (*FDI*) and the amount or share of the affiliate exports to countries other than the host and the parent country (*Export-Platform FDI*). Both of these measures are based on the data from U.S. majority owned affiliates abroad collected by the Bureau of Economic Analysis (BEA). The sample covers 40 countries and 6 SIC 2-digit level manufacturing industries from 1986 to 1999. The dependent variable considered in equation (1) is the total amount of affiliate sales multinationals incur at industry k in a host country j at year t. The export-platform FDI is measured by either the level or the share (relative to the total affiliate sales) of the exports to third countries by U.S. multinational affiliates.[8]

Table 1 takes a brief glance at the distribution of U.S. FDI across host regions and sales destinations. 5 major regional blocs that were integrated at different time are considered: the EU (15 members), Canada-Mexico, South America, ASEAN, and Australia-New Zealand. First, the volume of total U.S. FDI has been growing at an annual rate of 13% between 1986 and 1998. Similar growth is observed in the volume of FDI flow to each of the major regional blocs. Second, in terms of the distribution of FDI across host regions, it appears that the percentage of FDI toward Canada and Mexico has slightly declined from 18% to 15% from 1986 to 1998 while the percentage toward the ASEAN countries has slightly increased from 3% to 6%. Then, the FDI in each bloc is broken into three categories according to the sales destinations. The first category is the percentage of local sales by U.S. multinational affiliates, capturing the horizontal type of FDI that is intended to seek markets and avoid trade costs. As shown, this dimension of FDI is dominant in all regional blocs perhaps with an exception of the ASEAN countries. However, U.S. multinationals have become less local-market oriented over time also except the ASEAN bloc. The second category, the percentage of exports back to the U.S., reflects U.S. multinationals' comparative advantage motive when they move their production abroad and make the vertical type of FDI. It is shown that this percentage grows significantly in the Canada-Mexico bloc especially since the NAFTA in 1994, but falls in South America and ASEAN. Last, the share of affiliate sales to third countries (excluding the host country and the U.S.), labeled as the export-platform FDI (and often considered as a combination of horizontal and vertical FDI), is steadily growing in the EU, South America, and Australia-New Zealand. In sum, the data seems to imply that, even though the volume

[7] By including year and region fixed effects, the paper essentially adopts the difference-in-difference estimator to analyze the effect of regional trade agreements.

[8] An additional exercise is taken in the Appendix to directly examine multinationals' geographic concentration ratio, and finds that regionalism does lead to multinationals to increasingly concentrate their activities within the integrated blocs.

of FDI grows in each regional bloc, the weight of different types of FDI varies across regions and over time.

Now consider the regressors included to estimate the FDI, which consist of three groups. First, host-country specific variables. The market size of a host country is captured by GDP per capita and population, which are obtained from the World Bank's World Development Indicators. The proxy for the production cost, i.e., the relative human capital, is measured by the (five-year) average years of schooling taken from Barro and Lee (2001). The average corporate tax rate of a host country is calculated following the methodology discussed in Hines and Rice (1994). Two regressors are included to represent the trade cost between the host country and the United States, i.e., freight and tariff. An ad valorem measure of the freight and insurance cost is constructed from the U.S. import data as discussed in Feenstra (1996). The tariff data is the weighted average tariff based on the disaggregate SITC tariff data from the COMTRADE database.

The second group of regressors is industry-specific characteristics. An industry's capital intensity is the weighted average of the share of capital expenditure in value added. Similarly, the measure of an industry's skilled-labor intensity is the weighted average of the share of nonproduction workers in valued added by industry, following Midelfart-Knarvik, Overman, and Venables (2000). The data sources include the NBER-CES manufacturing industry database and the U.S. Annual Survey of Manufacturers. The plant scale in an industry is measured by the average size of a plant in the United States in terms of the number of production workers, constructed from the U.S. Annual Survey of Manufacturers. This variable captures the cost of maintaining additional production facilities.

The third group of regressors represents the status of regional economic integration through either a regional trade agreement or standards harmonization. The RTA variable is a dummy variable that is equal to 1 if there exists a regional trade agreement between the host country and any other country. Noteworthily, it is possible that some countries are members of more than one trade agreement, such as the member states of EFTA (the EFTA has also signed Free Trade Agreements (FTAs) with other countries such as Turkey and Israel), or countries may belong to a large regional trade agreement. These countries are entitled with better market access to a big set of markets and are thus more likely to attract FDI. Thus, RTA can be alternatively computed by the total market size (measured in summed GDP) of all the countries which grant preferential market access to a given host country. The other scheme of regional economic integration is standards harmonization, which uniforms the initially diverse standards across participating countries. This variable takes the value of 1 if the host country harmonizes its standards with any other country, and 0 otherwise. As the EU standards harmonization is implemented only in certain industries and at varied time, the variable varies by industry and year.

4 Empirical Results

4.1 The effect of regionalism on FDI

Table 2 summarizes the estimation results based on equation (1). As reported in the second column, most regressors included are found statistically significant in determining the level of FDI under OLS with robust standard errors. A country with a 1% higher income sees 1.73% greater sales by multinational affiliates, while a 1% larger population is associated with 1.26% more affiliate sales. Both of these estimates suggest that market size has a significant and more than proportional effect on the level of FDI. The estimated coefficient on "human capital" is statistically significant and negative, implying that countries with a less educated labor force tend to attract more FDI. Such impact seems stronger in unskilled-labor intensive industries, but the difference is not statistically significant. Further, a 1% higher level of corporate tax in a host country adversely affects multinationals' affiliate sales by 1.05%. Multinational firms' tariff-jumping motive is also confirmed in the table. A 1% higher level of tariff imposed by the host country stimulates multinationals' affiliate sales by 0.46%. However, the relationship between the freight cost and FDI is found negative. This result seems to be consistent with a vertical FDI model, because when a multinational firm exports the intermediate inputs from its home headquarter to its affiliates abroad for assembly the FDI activity may be discouraged by distance and transport cost. In the category of industry characteristics, the effects of skilled-labor intensity and production scale at home country turn out positive but statistically insignificant. In the third category of Table 2, the estimated impact on multinationals' affiliate sales of regional economic integration is reported significant. A member of a RTA sees a 1.33 times greater level of affiliate sales by U.S. multinationals than a country that is excluded from any RTA.[9] Deeper integration undertaken by the EU to address technical barriers to trade also leads to a 1.18-times greater level of U.S. affiliate sales.

The rest of Table 2 considers multinationals' entry decision separately from their volume of affiliate sales, and report the results based on the Heckman selection model. In the first stage, the impact of all the control variables on multinationals' entry decision is first estimated in a probit model. Subsequently, the second stage takes into account the probability for each host country to attract multinationals (reflected in the inverse mills ratio), and estimates the effect of control variables on the volume of FDI.[10] As shown in Table 2, the measures of market size,

[9] As an additional check, RTA was divided to two different variables: the NAFTA which involves the U.S. (the home country of multinationals in this paper) and the other regional trade agreements to examine if these two types of agreements affect U.S. multinationals' FDI decision differently. It is found that, while NAFTA on average does not significantly raise U.S. outward FDI in Canada and Mexico, the other RTAs do appear to provide a significant stimulus for U.S. multinationals.

[10] Given that the variable "production scale" is shown not to affect the FDI significantly in the previous OLS regression, it is chosen as an instrument in the Heckman estimation to be excluded in the second stage.

i.e., GDP per capita and population of the host countries, pose an impact on both the binary and volume decisions of FDI. For example, in a host country with one-time higher GDP per capita, the likelihood of attracting FDI is one-percentage point greater while the volume of FDI is 68% larger. Further, it is shown that skilled labor abundance is negatively correlated with the probability of attracting foreign investors although its impact on the FDI volume is statistically insignificant. A country with high corporate tax rate not only is less likely to become the host country of U.S. multinationals but also sees a lower level of affiliate sales. Interestingly, the tariff set by the host country only has an significant and positive impact on multinationals' entry decision, whereas the freight cost seems to mainly affect the volume of FDI adversely. In terms of industry characteristics, production scale reduces the likelihood of foreign direct investment while skilled-labor intensity affects neither multinationals' entry decision nor their affiliate sales volume significantly. Moreover, a member of a RTA not only is one-percentage point more likely to receive foreign direct investment, but also has a 32% larger volume of affiliate sales by U.S. multinationals. Regional agreement on standards, in contrast, only affects positively and significantly the volume of affiliate sales by 38%.

4.2 The RTA networks

To better interpret the landscape of regionalism, a simple analogy can be drawn between an integrated region and a local network. First, like local networks, integrated regional blocs are not equally sized. For instance, while the European Union has now included 25 member countries, the MERCOSUR consists of many fewer nations. Multinationals located in a larger bloc are granted with preferential tariff by more countries. Hence, a "network effect" arises: an integrated region's ability of attracting multinationals increases with the size of the region. Second, as networks may overlap regional blocs may have mutual member countries. These countries, which belong to more than one RTA, essentially become hubs with better market access to all the spoke nations. As the hub-and-spoke arrangement increasingly emerges in regional economic integration, multinationals may likely concentrate their activities in hub countries and serve the spoke countries through exports. Hence, a more informative measure is adopted to reflect the size of the RTA network(s) a country belongs to, by summing up the GDP of all the countries that grant preferential tariff to the considered host country.

As shown in all columns of Table 3, there exists a statistically significant and positive relationship between the size of a host's RTA network(s) and its receipt of FDI — measured in both the probability and volume of FDI. The more countries with which a host country has preferential trading relationships with, not only the greater likelihood for this country to receive FDI but a larger volume. Having preferential market access to an additional country of equal size measured in GDP raises the host country's FDI from the U.S. by 3% as reported in the second column; when the Heckman model suggests that the former also encourages

entry of U.S. multinationals the estimated effect is adjusted downward. This finding suggests members of large integrated blocs and hub countries which belong to more than one RTA are more favored by U.S. multinationals. The estimated effect of standards harmonization on the volume of FDI is similarly found significant and positive. The rest of the estimates remain very similar to Table 2.

4.3 The varied effect of regionalism

After identifying the average impact on multinationals' affiliate sales of regional agreements dealing with trade barriers, this section proceeds to address how this impact differs across locations and industries: What types of host countries benefit more in attracting FDI from a RTA and/or standards harmonization agreement? In what industries do multinationals raise or reduce more FDI after regionalism? To answer these question, the two "regionalism" variables are interacted respectively with country- and industry-specific variables, with the estimation results reported in Table 4.[11]

As seen in the both models of Table 4, the positive effect of a RTA on attracting FDI is more pronounced in a host country with higher income, lower corporate tax, higher tariff rate, or more expensive freight cost, whereas the positive effect of standards harmonization in a host country is stronger when the host country has higher income, less skilled labor force, or higher tariff. For example, a RTA member country sees 0.95% more affiliate sales given 1% higher GDP per capita, or 1.02% more affiliate sales when imposing 1% lower corporate tax. A harmonizing country with 1% greater GDP per capita has 1.36% higher affiliate sales than other harmonizing countries, while a 1% fewer years of schooling leads to at least 2.16% more affiliate sales by U.S. multinationals. In contrast to Tables 2 and 3, the parameter of the term interacting RTA with freight cost is found positive and suggests that regional trade agreements may promote more horizontal type of FDI. However, in terms of the industries that benefit more in FDI from regionalism, the evidence is contrary between the two types of regional agreements. The positive impact of RTA on FDI is shown stronger in both skilled-labor intensive industries and those with large production scale, while regionalism that deals with technical barriers to trade is less FDI promoting in these industries. Even though both schemes of economic integration would motivate firms to concentrate their production geographically especially in industries with a large production scale, in the case of standards harmonization firms are allowed to do so at home and yet enjoy the benefit of integration because of the absence of exclusiveness in the agreement.

Hence, it appears that the FDI effect of regionalism does vary across host countries. While some countries — thanks to their high income and attractive tax policies or because of the expensive trade cost — become increasingly more popular after joining regional agreements,

[11] Table 4 reports a selected list of estimates, but the complete table is available upon request.

other countries could very likely lose FDI even as a member of RTA and be now served by U.S. multinationals through intra-regional trade. What underlies the divergent impact of regionalism seems to be that, after the fall in trade costs and rise of scale economies, it is more costly to supply some markets through local production than exports. The factors that affect multinationals' entry and investment decisions have become more critical in the context of regionalism.

4.4 The effect of regionalism on export-platform FDI

As predicted in Motta and Norman (1996), a phenomenon that shall directly follow regional trade liberalization is the rise of the export-platform FDI. With the decline in trade costs, it becomes less costly for multinationals to supply some markets by exporting than establishing a separate production plant. Thus, some countries may gain industries (including multinational firms) at the expense of the others within the same regional bloc, even though the average impact on FDI appears to be positive in section 4.1. This section adopts the exports of multinational affiliates to third countries as a new dependent variable and examines how regional economic integration may lead to the rise of export-platform FDI.

As shown in Table 5, similar to the previous analysis of total FDI, a country's income, population, corporate tax rate, and freight cost are all significant factors in determining the binary decision and size of export-platform FDI.[12] A country with higher GDP per capita, larger population, lower corporate tax or higher freight cost is not only more likely to become an export platform but tends to see a greater volume of export-platform FDI in its market. However, while the presence of a relatively high tariff raises a country's likelihood of serving as an export platform, its effect on the level of export-platform FDI is insignificant. Countries with less skilled labor are more likely to be selected as export platforms especially in unskilled-labor intensive industries, consistent with the comparative advantage motive of FDI. In the meantime, while the skilled-labor intensity of an industry reduces the probability for multinationals to adopt export platforms relative to producing at home, it is positively correlated with the volume of exports by multinational affiliates. In other words, skilled-labor intensive firms tend to export from either their home country or their existing host countries rather than exploring a new location to serve third countries. Likewise, industries that operate with a large production scale are less likely to serve third countries from a new foreign location as opposed to from their home country. Regional economic integration also plays a significant role in determining export-platform FDI: not only is a RTA member on average more likely to become an export platform, but this chance rises significantly for

[12] When the Heckman selection model is employed to address the effect of the control variables respectively on the binary decision and volume of export-platform FDI, both human capital and production scale, which do not show up significant in the OLS regression, are chosen as instruments.

members of large integrated blocs and/or of more RTA memberships. The positive effect of standards harmonization only appears significant in the OLS model.

While the evidence points out that RTA promotes the possibility of export-platform FDI, a further step may be taken to examine the share of export-platform FDI. As found in Table 6, countries with a large population are more possible candidates for export platforms, suggested by its positive parameter in the second stage of the Heckman model. However, multinationals located in these countries tend to have a smaller share of export-platform FDI and instead incur a larger percentage of sales to supply the large local market. Not surprisingly, multinationals' propensity to supply third countries through exports is much stronger in host countries that are part of one or more regional trade agreements and rises when host countries are granted with preferential market access to an increasing number of nations. The harmonization of product standards, despite of its insignificant effect on the binary decision and volume of export-platform FDI, raises multinationals' share of FDI intended to serve third markets. The other estimates are qualitatively similar to Table 5.

5 Conclusion

This paper examines empirically how regionalism, in the form of RTA or standards harmonization, has affected foreign direct investment and prompted U.S. multinationals to develop a more concentrated location structure. It is shown that improved market accessibility, through intra-regional tariff reduction, leads to an increase of both the probability of multinationals' entry and the volume of FDI in the regional bloc, lending empirical support to the theoretical prediction by studies such as Motta and Norman (1996), while regional agreement that tackles technical barriers to trade has a positive impact on the volume of FDI. This finding is not surprising, provided that, standards harmonization, in contrast to the RTA which reduces the variable trade cost exclusively to inside firms, lowers the (fixed) cost of supplying the member countries to firms of all locations, and thus does not necessarily encourage entry by multinational firms. Further, countries that are connected to more than one RTA or a RTA of a greater size are found to attract more FDI because their preferential market access to a large number of countries. However, these impacts are evidently asymmetric — or even contrary — across host countries dependent on their market size, comparative advantage and other characteristics. In response to the formation of a RTA, multinationals move more production to inside countries with a larger market size, a lower corporate tax rate or a more expensive trade cost, and supply the rest of the countries through exports. In the case of standards harmonization, multinationals are also motivated to concentrate their production in certain locations, such as countries with unskilled labor force, to enhance the economies of scale.

The analysis of export-platform FDI deepens the understanding of how regionalism affects

multinationals' investment decisions and generates evidence of geographic concentration of U.S. multinationals. A decline in the variable trade cost makes it less costly for firms to supply some countries through exports than local production, and therefore export-platform FDI has become an increasingly important strategy adopted by multinational firms. The evidence shows that countries with large market size, low corporate tax rate or high trade cost receive more export-platform FDI. In the context of regionalism, hub countries or countries belonging to a large RTA network, again, because of their better access to a broad set of markets, are more likely to become export platforms for multinational firms.

Appendix

Regionalism and multinationals' geographic concentration

To directly examine whether regionalism indeed reshaped U.S. outward FDI from a dispersed structure toward a more concentrated one, an alternative approach is employed to estimate the multinationals' geographic concentration ratio in the following equation:

$$Concentration_{ikt} = \alpha' + \beta' \cdot Host\_var_{ikt} + \gamma' \cdot Industry_{kt} + \theta' \cdot Size\_region_{ikt} + \varepsilon'_{ikt}. \quad \text{(a.1)}$$

To compute the geographic concentration ratio estimated in the above equation, the 40 sample countries are partitioned to 7 regions that either adopted an economic integration agreement during the sample period (EC-EFTA, NAFTA, ANDEAN, ASEAN, MERCOSUR, and CER) or never reached any agreement during this period (ROW).[13] For each of the 7 regions, the Gini coefficient is calculated to measure the inequality of country shares in multinationals' affiliate sales: the more equal the country shares, the more diversified multinationals' location pattern.[14] $Host\_var_{ikt}$ is defined as

$$\beta' \cdot Host\_var_{ikt} = \beta'_1 Market\_size\_var_{ikt} + \beta'_2 Prod\_cost\_var_{ikt} + \beta'_3 Tax\_var_{it} \quad \text{(a.2)}$$

representing the geographic concentration ratio of market size, and variance of production cost and tax rate in region i. In particular, Gini indices are computed to represent the inequality of income and population across member countries within a region, and the log variances of schooling years, corporate tax, freight cost, and tariff within a region are also

[13] The definition of a region is less straightforward in the case of EC, EFTA and the countries that reached a Free Trade Area (FTA) agreement with either EC or EFTA such as Turkey. For simplicity, all the above countries are considered as a single region.

[14] Hence, the Gini coefficient is positively associated with the extent of geographic concentration. An alternative index is the Herfindahl index that has been widely used to represent concentration, for instance, within an industry. However, the Herfindahl index doesn't suit the purpose of this paper because the number of countries involved in each region varies and, as a result, a cross-region comparison of the Herfindahl index would be misleading.

included to capture the intra-regional diversification in production/trade cost. When there exists a significant difference across member states in their market size or production cost, multinationals should be more likely to concentrate their FDI geographically, either in countries with large market size or those with low production cost. The vector of industry-specific regressors, $Industry_{kt}$, is defined in equation (3). A capital intensive industry or a skilled-labor industry is more likely to see a greater concentration ratio for it is perhaps more costly to produce in multiple locations, unless the capital-intensive or skilled-labor intensive activities (headquarter management or R&D) in a firm are separable from its production. The concentration ratio, however, would be increasing in a firm's production scale. The third vector of regressors, $Size\_region_{ikt}$, represents the number of countries that are included in the integrating region at a given time and is defined as:

$$\theta' \cdot Size\_region_{ikt} = \theta_1' Size\_RTA_{it} + \theta_2' Harmonization_{ikt}. \tag{a.3}$$

$Size\_RTA_{it}$ denotes the size of a RTA at a given year in terms of the number of member states or the summed GDP of member states. Provided that regional trade agreements are exclusive to firms located within the region, their impact on intra-regional geographic concentration is expected to be positive. Further, as more countries in the region sign up for the regional trade agreement, firms' incentive to concentrate their production in this region is increased. Similarly, the expected impact of standards harmonization on the multinationals' concentration in a given region is also positive because it provides firms with an opportunity to enhance economies of scale.

Using the Papke-Wooldridge GLM model which is designed for fractional dependent variables, Table A reports the estimation results.[15] As shown, a region with a more concentrated population distribution receives more concentrated FDI. In fact, a one-percentage-point increase in the population concentration index is associated with at least a 1.64-percentage-point increase in the FDI concentration index. However, it is also shown that a region with a more divergent distribution of GDP per capita tends to have a more dispersed distribution of FDI. Further, the variance of human capital within a region is also inversely associated with the multinationals' sales concentration in the region though the negative correlation appears to be weaker in skilled-labor intensive industries. This finding is plausible in that member states with diverse labor force may attract various types of industries and thus the aggregate FDI pattern in the region appears dispersed.

The expansion of economic integration within a region, measured by the increase in the number of members in a RTA or the increase in the integrated market size (GDP), is also included in the estimation. As shown in Table A, the expanded size of a RTA in a given region

[15] Again, the paper employs the difference-in-difference estimator to analyze the effect of regional trade agreement on U.S. multinationals' geographic concentration in a region.

is significantly and positively associated with the multinationals' geographic concentration in this region. To be specific, an addition of a member country in a RTA leads to at least an increase of four percentage points in the constructed Gini index. When the EU member states harmonize their product standards, the geographic concentration ratio in affected industries rises by 22 percentage points.

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Table 1: The distribution of U.S. FDI across host regions and sales destinations

Host regions/Sales destinations	1986	1990	1994	1998
World	720,069 (100%)	1,208,349 (100%)	1,435,901 (100%)	1,971,909 (100%)
EU	359,438 (49%)	647,098 (53%)	725,336 (50%)	1,000,725 (50%)
Local sales	66%	68%	67%	63%
Exports back to the U.S.	3%	3%	3%	5%
Exports to third countries	29%	28%	29%	31%
Canada-Mexico	133,950 (18%)	197,997 (16%)	233,245 (16%)	303,019 (15%)
Local sales	72%	73%	69%	66%
Exports back to the U.S.	24%	23%	28%	30%
Exports to third countries	3%	3%	2%	3%
South America	37,622 (5%)	53,755 (4%)	65,466 (4%)	122,075 (6%)
Local sales	85%	86%	85%	82%
Exports back to the U.S.	8%	6%	5%	4%
Exports to third countries	6%	7%	9%	12%
ASEAN	23,377 (3%)	51,260 (4%)	85,580 (6%)	118,091 (6%)
Local sales	35%	47%	49%	43%
Exports back to the U.S.	29%	22%	19%	22%
Exports to third countries	35%	30%	31%	34%
Australia-New Zealand	25,258 (3%)	43,809 (3%)	64,346 (4%)	58,308 (3%)
Local sales	88%	85%	86%	84%
Exports back to the U.S.	2%	4%	3%	3%
Exports to third countries	8%	10%	10%	13%

Table 2: The FDI effect of regionalism (a)

Dependent variable: FDI	OLS	Heckman		
		Stage 1		Stage 2
		Coef.	dF/dx	
Host-country characteristics				
GDP per capita	1.7322***	2.8504***	0.0111***	0.6849***
	(0.1457)	(0.3249)	(0.0067)	(0.1267)
Population	1.2656***	0.7222***	0.0028***	1.2124***
	(0.0549)	(0.1612)	(0.0016)	(0.0516)
Human capital	-2.1357***	-5.0763***	-0.0199***	0.3103
	(0.4499)	(2.0059)	(0.0148)	(0.5436)
×Skilled-labor intensity	0.6504	4.0606	0.0159	-1.8086
	(1.7371)	(6.8922)	(0.0294)	(2.0284)
Corporate tax	-1.0560***	-0.4831***	-0.0018***	-0.8303***
	(0.0857)	(0.1406)	(0.0013)	(0.0757)
Tariff	0.4680***	1.0836***	0.0042***	0.1207
	(0.0998)	(0.1800)	(0.0026)	(0.0820)
Freight	-0.6087***	-0.1663	-0.0006	-0.4540***
	(0.0911)	(0.1454)	(0.0006)	(0.0811)
Industry characteristics				
Skilled-labor intensity	1.4449	-20.6410	-0.0809	7.4313
	(4.8923)	(13.7586)	(0.0756)	(5.2242)
Production scale	0.5286	-0.7232***	-0.0028***	–
	(0.4056)	(0.1541)	(0.0019)	
Regionalism				
RTA	0.8468***	1.0558***	0.0145***	0.2811*
	(0.1870)	(0.2603)	(0.0099)	(0.1696)
Standards harmonization	0.7799***	-0.0629	-0.0002	0.3233***
	(0.1624)	(0.2702)	(0.0011)	(0.1393)
Number of observations	1365	1365		
Number of censored observations		84		
R squared/Wald chi2	0.66	1309.90		

Notes: (i) all variables are measured in natural logs except skilled-labor intensity, RTA, and harmonization; (ii) standard errors are reported in the parentheses; (iii) region, industry, and year fixed effects are included; (iv) ***, **, and * represent significance at 1%, 5%, and 10% level respectively.

Table 3: The FDI effect of regionalism (b)

Dependent variable: FDI	OLS	Heckman		
		Stage 1		Stage 2
		Coef.	dF/dx	
Host-country characteristics				
GDP per capita	1.7280***	2.8634***	0.0111***	0.6817***
	(0.1457)	(0.3261)	(0.0067)	(0.1273)
Population	1.2563***	0.7118***	0.0027***	1.2090***
	(0.0550)	(0.1615)	(0.0016)	(0.0521)
Human capital	-2.1339***	-5.0811***	-0.0197***	0.3173
	(0.4508)	(2.0190)	(0.0147)	(0.5473)
×Skilled-labor intensity	0.6800	4.0120	0.0155	-1.8210
	(1.7444)	(6.9399)	(0.0292)	(2.0427)
Corporate tax	-1.0602***	-0.4812***	-0.0018***	-0.8313***
	(0.0857)	(0.1412)	(0.0013)	(0.0762)
Tariff	0.4888***	1.0954***	0.0042***	0.1281
	(0.1002)	(0.1807)	(0.0026)	(0.0828)
Freight	-0.6071***	-0.1677	-0.0006	-0.4538***
	(0.0911)	(0.1456)	(0.0006)	(0.0817)
Industry characteristics				
Skilled-labor intensity	1.2291	-20.5830	-0.0799	7.4005
	(4.8970)	(13.8454)	(0.0751)	(5.2616)
Production scale	0.5284	-0.7128***	-0.0027***	–
	(0.4065)	(0.1543)	(0.0019)	
Regionalism				
Size (GDP) of the RTA network	0.0336***	0.0394***	0.0001***	0.0118**
	(0.0072)	(0.0093)	(0.0001)	(0.0064)
Standards harmonization	0.7688***	-0.0929	-0.0003	0.3206***
	(0.1618)	(0.2723)	(0.0012)	(0.1403)
Number of observations	1365	1365		
Number of censored observations		84		
R squared/Wald chi2	0.66	2378.63		

Notes: (i) all variables are measured in natural logs except skilled-labor intensity and harmonization; (ii) standard errors are reported in the parentheses; (iii) region, industry, and year fixed effects are included; (iv) ***, **, and * represent significance at 1%, 5%, and 10% level respectively.

Table 4: The varied impact of regional agreements

Dependent variable: FDI	OLS		Heckman (stage 2)	
Regionalism	RTA	Harmonization	RTA	Harmonization
RTA/Harmonization	-18.3668***	-1.4468	-13.2439***	1.7494
	(4.3068)	(4.5315)	(2.1119)	(3.2337)
×GDP per capita	0.9574***	1.3629***	0.2270	0.8548***
	(0.2592)	(0.4902)	(0.1806)	(0.3534)
×Population	0.3275	0.0674	0.3431***	0.0389
	(0.2224)	(0.1247)	(0.1253)	(0.1044)
×Human capital	1.5366	-3.4412***	2.0461***	-2.1605***
	(1.0102)	(0.7933)	(0.6148)	(0.6812)
×Tax	-1.0240***	-0.1940	-0.7787***	-0.1178
	(0.4096)	(0.1933)	(0.2434)	(0.1506)
×Tariff	0.4344***	0.6179**	0.1136	0.5348***
	(0.1805)	(0.3164)	(0.1278)	(0.1937)
×Freight	0.7796***	-0.4047*	0.5484***	-0.0647
	(0.3337)	(0.2528)	(0.1370)	(0.1941)
×Skilled-labor intensity	4.1193***	-8.6616**	3.3674***	-14.0906**
	(1.5078)	(4.0904)	(1.2242)	(3.1078)
×Production scale	0.7568***	-0.7995***	0.7539***	-0.7978***
	(0.3078)	(0.2830)	(0.2004)	(0.1803)
Number of observations	1365		1365	
R squared/Wald chi2	0.70		2070.24	

Notes: (i) The parameters of other control variables are very similar to previous tables and not reported; (ii) The last two columns report the results from the second stage of the Heckman model; (iii) all variables are measured in natural log except skilled-labor intensity, RTA, and harmonization; (iv) Standard errors are reported in the parentheses; (v) region, industry, and year fixed effects are included; (iv) ***, **, and * represent significance at 1%, 5%, and 10% level respectively.

Table 5: Regionalism and export-platform FDI

Dep. variable: export-platform FDI	OLS	Heckman		
		Stage 1		Stage 2
		Coef.	dF/dx	
Host-country characteristics				
GDP per capita	1.6421***	2.3550***	0.0771***	0.9449***
	(0.2097)	(0.2899)	(0.0268)	(0.1534)
Population	1.2597***	0.8038***	0.0263***	0.9925***
	(0.0795)	(0.1671)	(0.0082)	(0.0735)
Human capital	-0.6129	-6.0332***	-0.1976***	–
	(0.6591)	(1.7077)	(0.0896)	
×Skilled-labor intensity	-5.0688**	13.4357***	0.4402***	-5.8750***
	(2.7733)	(5.8751)	(0.2476)	(1.5898)
Corporate tax	-1.6934***	-0.6561***	-0.0214***	-1.3615***
	(0.1263)	(0.1593)	(0.0091)	(0.1116)
Tariff	0.3271**	0.8319***	0.0272***	-0.0257
	(0.1572)	(0.1911)	(0.0133)	(0.1094)
Freight	-0.5489***	-0.3069**	-0.0100**	-0.4108***
	(0.1081)	(0.1760)	(0.0064)	(0.1123)
Industry characteristics				
Skilled-labor intensity	13.6772*	-35.1369***	-1.1512***	23.9984***
	(7.4443)	(11.9323)	(0.5604)	(5.6464)
Production scale	0.6423	-0.7108***	-0.0232***	–
	(0.4595)	(0.1765)	(0.0106)	
Regionalism				
Size (GDP) of the RTA network	0.0318***	0.0197**	0.0006**	0.0083
	(0.0104)	(0.0101)	(0.0004)	(0.0092)
Standards harmonization	0.4991***	0.2701	0.0077	0.0130
	(0.2143)	(0.2784)	(0.0078)	(0.1924)
Number of observations	794	868		
Number of censored observations		99		
R squared/Wald chi2	0.63	1568.98		

Notes: (i) all variables are measured in natural logs except skilled-labor intensity and harmonization; (ii) standard errors are reported in the parentheses; (iii) region, industry, and year fixed effects are included; (iv) ***, **, and * represent significance at 1%, 5%, and 10% level respectively.

Table 6: Regionalism and the share of export-platform FDI

Dep. variable: export-platform FDI (%)	OLS	Heckman		
		Stage 1		Stage 2
		Coef.	dF/dx	
Host-country characteristics				
GDP per capita	0.0576***	2.3279***	0.0751***	0.0704***
	(0.0170)	(0.2888)	(0.0263)	(0.0167)
Population	-0.0331***	0.8248***	0.0266***	-0.0554***
	(0.0097)	(0.1676)	(0.0084)	(0.0080)
Human capital	0.1185	-5.7817***	-0.1866***	–
	(0.0725)	(1.7030)	(0.0868)	
×Skilled-labor intensity	-0.7043**	12.7740***	0.4124***	-0.5886***
	(0.2706)	(5.8628)	(0.2408)	(0.1737)
Corporate tax	-1.1504***	-0.6741***	-0.0217***	-0.1363***
	(0.0144)	(0.1603)	(0.0092)	(0.0122)
Tariff	0.0248***	0.8271***	0.0267***	0.0244**
	(0.0113)	(0.1914)	(0.0112)	(0.0119)
Freight	-0.0251***	-0.2952*	-0.0095*	-0.0276***
	(0.0117)	(0.1764)	(0.0062)	(0.0123)
Industry characteristics				
Skilled-labor intensity	1.7244**	-33.9685***	-1.0966***	1.8585***
	(0.7484)	(11.8828)	(0.5462)	(0.6185)
Production scale	0.0082	-0.7402***	-0.0239***	–
	(0.0487)	(0.1798)	(0.0109)	
Regionalism				
Size (GDP) of the RTA network	0.0027***	0.0236**	0.0007**	0.0016
	(0.0010)	(0.0105)	(0.0004)	(0.0010)
Standards harmonization	0.0540***	0.3055	0.0085	0.0438**
	(0.0213)	(0.2814)	(0.0077)	(0.0211)
Number of observations	794	865		
Number of censored observations		99		
R squared/Wald chi2	0.63	1568.98		

Notes: (i) all variables are measured in natural logs except skilled-labor intensity and harmonization; (ii) standard errors are reported in the parentheses; (iii) region, industry, and year fixed effects are included; (iv) ***, **, and * represent significance at 1%, 5%, and 10% level respectively.

Table A: Multinationals' geographic concentration

Dep. variable: Concentration	(1)	(2)
Regional variation of		
GDP per capita	-1.4696***	-2.7148***
	(0.6585)	(0.3935)
Population	1.6465**	3.7376***
	(0.9044)	(0.3195)
Human capital	-0.6460***	-0.8205***
	(0.1292)	(0.1413)
×Skilled-labor intensity	1.0144*	0.9806*
	(0.5843)	(0.5989)
Corporate tax	0.0161	-0.0047
	(0.0258)	(0.0239)
Tariff	-0.0550	-0.0186
	(0.0986)	(0.1005)
Freight	-0.3899***	-0.3947***
	(0.1577)	(0.1504)
Industry characteristics		
Skilled-labor intensity	0.4895	0.4367
	(0.8278)	(0.8422)
Production scale	0.0222	0.0159
	(0.0785)	(0.0781)
Regionalism		
Number of RTA members	0.0450***	
	(0.0173)	
Size (GDP) of RTA members		0.0110**
		(0.0056)
Standards harmonization	0.2224***	0.2592***
	(0.1050)	(0.1052)
Number of observations	261	261
Log pseudo-likelihood	-114.82	-114.90

Notes: (i) The Papke-Wooldridge GLM model is employed; (ii) Standard errors reported in the parentheses are robust to heteroskedasticity; (iii) year fixed effect is included; (iv) ***, **, and * represent significance at 1%, 5%, and 10% respectively.