

**Norte o Sul/Sur? Multilatinas' Choice of Developed versus Developing Countries for Foreign Direct Investment**

**Track: Strategies for Global Competitiveness**

**Key words: multilatinas, foreign direct investment, location choice**

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**Abstract**

We develop novel theory and empirical evidence on multilatinas to understand the determinants of their choice between foreign direct investment (FDI) in developed countries (“Northern” FDI) and in developing countries (“Southern” FDI). We theorize that multilatinas will engage in Northern versus Southern FDI based on distinct firm- and industry-specific characteristics. Our empirical evidence based on a sample of 124 multilatinas from Brazil, Chile and Mexico is largely, but not entirely, consistent with our developed hypotheses. We find labor intensity associated with Southern FDI, and a positive interactive effect on Northern FDI between R&D intensity and competing in a high-tech industry.

## **Introduction**

Fundamental to global strategy and international business (IB) research is understanding why firms engage in foreign direct investment (FDI) and thus become multinational enterprises (MNEs). A long-standing view is that firms must possess ownership or firm-specific advantages to compete in foreign countries against host-country and other foreign rivals (Dunning, 1980; 1993; Ramamurti, 2012) and to overcome inherent liabilities of foreignness (Zaheer, 1995). This well-established view is based on MNEs seeking new markets for their products and or services.

More recently, however, scholars have suggested that firms engage in FDI not only to seek new markets but also to seek new knowledge (Luo and Tung, 2007). Seeking new knowledge as a reason for FDI has, not surprisingly, coincided with an increase in FDI by MNEs from developing and so-called emerging market countries. These developing-country MNEs are globally pervasive, spanning the globe from countries such as Brazil, Chile, China, India and Mexico. And they are becoming increasingly more competitive with MNEs from highly-developed countries. For example, Brazilian-based Embraer is now one of the largest manufacturers of aircraft in the world.

Studying the reasons why developing-country MNEs engage in FDI facilitates understanding of MNE behavior in general because, unlike MNEs from developed countries, MNEs from developing countries can choose to engage in FDI in similar developing countries (“Southern FDI”) or they can choose to engage in FDI in more developed countries (“Northern FDI”). Examining developing-country MNE foreign location decisions requires theorizing and observing these relatively new MNEs from many different parts of the world, in order to avoid assuming, for example, that Chinese MNEs behave similarly to Brazilian MNEs. Home-country contexts differ, and implications for outward FDI are affected by these country contexts. For example, Fleury and Fleury (2009) discussed the historical development of Brazilian MNEs, and the uniqueness of the Brazilian context. Cuervo-Cazurra (2007) also highlighted the importance of context, and focused on pro-market reforms in Latin America that have facilitated FDI by MNEs from Latin America, often called multilatinas. Further, while much developing-country MNE research has focused on MNEs from developing Asian countries, relatively little research has focused on multilatinas (Cuervo-Cazurra, 2010). Finally, research focused on multilatinas has not theorized nor provided large-sample empirical evidence about how particular firm- and industry-specific characteristics affect multilatinas’ decisions to engage in FDI in developed versus other developing countries.

In this study, we address this theoretical and empirical research gap. First, on the theory side, we develop hypotheses drawing from well-established views about MNEs seeking new markets in foreign countries and from more novel views about MNEs seeking new knowledge in foreign countries. For multilatinas seeking new markets, the firm-specific or ownership advantages of multilatinas are likely more valuable and competitive in other developing countries. Dunning (1980;

1988) has stressed that firms' resources may be valuable only in certain but not all foreign countries. And Porter (1990) has stressed that firms based in certain countries possess advantages relative to firms based in other countries. Therefore, the match between home- and host-country environments for the competitiveness of firm's resources likely affects where a multilatina will choose to engage in FDI. Scholars have noted a relative difference between developed and developing countries with respect to whether firms engage in highly labor-intensive or highly capital-intensive operations (e.g., Erramili, Agarwal, and Kim, 1997; Porter, 1990). In this study, we extend this body of existing research and propose that highly labor-intensive operations by multilatinas, as developing-country MNEs, will make multilatinas' products and services more valuable and more competitive in other developing countries. Therefore, labor intensity more likely will be associated with FDI in developing rather than in developed countries. We also extend the body of more novel research about MNE FDI to seek new knowledge. We propose that certain firm- and industry-specific characteristics of multilatinas will tend to push them to engage in FDI in more developed countries (Northern FDI). Technological capabilities, as developed through investment in research and development (R&D), provides firms with absorptive capacity to increase the ability to identify and integrate new knowledge (Cohen and Levinthal, 1990). At the firm-level we propose that multilatinas with greater levels of R&D intensity will, presumably to seek new knowledge, engage in Northern FDI. At the industry level, we propose an increased likelihood of Northern FDI for firms located in high-technology ("high-tech") industries, which achieve competitive advantage through innovative products and services. Finally, we propose that high R&D intensity coupled with a multilatina competing in a high-tech industry will result in an even higher likelihood of Northern FDI.

Second, on the empirical side, we test these developed hypotheses using a sample of multilatinas from Brazil, Chile and Mexico, countries that provide sufficient firm observations to conduct large-sample statistical analyses. We find empirical support for three out of four hypotheses. Greater labor intensity is associated with FDI in developing rather than in developing countries. However, another firm-specific factor, R&D intensity, was not on its own associated with either Northern or Southern FDI. But R&D intensity did interact with high-tech industry in increasing the likelihood of Northern FDI. That is, we found firms in high-tech industries to be more likely to engage in Northern FDI, and this tendency was further increased by greater levels of R&D intensity. Thus, multilatinas that are the most likely to engage in FDI in developed countries are those firms with relatively high levels of R&D that compete in high-tech industries. If we neglect the role of industry, though, R&D intensity does not appear to affect multilatinas' decisions to engage in Northern versus Southern R&D. These results are robust to various alternative country samplings and the treatment of multilatina-specific effects.

The remaining of the paper is as follows. First, we theoretically develop our four hypotheses. Then, we describe our methodological approach, including sample and data sources, variable descriptions and estimation techniques. Then, we

explain our primary results of the hypotheses tests as well as robustness and sensitivity of our primary results. Finally, we discuss implications of our study, followed by limitations and future research.

### **Theory and Hypotheses**

Historically, most research on MNEs has focused on MNEs from developed countries, and understandably so given that much outward FDI was due to MNEs from developed countries. Based at least partly on this phenomenon, researchers developed theories to explain FDI by MNEs. One of the principal reasons for the existence of the MNE has been ascribed to a firm possessing ownership advantages (Dunning, 1980; Ramamurti, 2012), which have also been referred to as firm-specific advantages. These ownership advantages by MNEs from developed countries provided the MNE with a source of competitive advantage in foreign countries, where they faced different product markets, cultures, languages and or political and regulatory environments. Ownership advantages of developed-country MNEs have come in the form of technological and product differentiation advantages (Gatignon and Anderson, 1988; Kogut and Singh, 1988; Stopford and Wells, 1972).

MNEs from developing countries, in contrast, have been viewed as deficient in these types of ownership or firm-specific advantages (Rugman and Ngygen, 2014). Yet, many scholars have argued that developing-country MNEs possess firm-specific advantages that are not necessarily deficient, but rather distinct from those of developed-country MNEs (Prahalad, 2006). Specifically, developing-country MNEs produce products that are more suited to the consumer demands in other developing countries. Plus, developing-country MNEs have experience and greater abilities in navigating regulatory and political institutional voids (Cuervo-Cazurra and Genc, 2008; Khanna and Palepu, 2006). Therefore, developing-country MNEs are viewed as possessing FSAs that are likely more competitive in other developing countries with, relative to developed countries, similar product demand and political environments.

A common characteristic of developing countries is firms with operations that rely on relatively high labor intensity. Dunning and Narula (1996) discuss how, as countries develop, they navigate away from labor-intensive industrial activity to more capital- and knowledge-intensive industrial activity. Extending these ideas, it is likely that multinationals that rely on more labor-intensive activities would be more competitive in other developing countries characterized by demands for products also produced with high labor-intensive operations. Because of a potential competitive advantage superior to or at least on par with other firms competing in other developing countries, it is likely that multinationals with highly labor-intensive operations will choose other developing countries for their FDI. Further, Mezas (2002) noted that many developing-country MNEs do not meet the labor and environmental requirements in developed countries. Multinational capabilities based on labor-intensive operations may allow multinationals to modify existing products to meet local conditions with similar consumer demands in other developing countries. Based on this reasoning, we expect high labor intensity by multinationals to be associated with FDI in other developing countries (Southern FDI) rather than in developed countries (Northern FDI).

*Hypothesis 1: Higher labor intensity by multinationals increases the likelihood of Southern FDI, defined as FDI in developing rather than in developed countries.*

Apart from multinationals being competitive in and thus choosing FDI in other developing countries, more recent research suggests that developing-country MNEs may choose FDI locations based on the desire to search for and to seek out new knowledge, often technologically-innovative knowledge. Luo and Tung (2007) describe a “springboard perspective” whereby developing-country MNEs go to developed countries to catch up with developed-country MNEs, who are often competing with developing-country MNEs in their own countries. Implicit in this perspective is the idea that developing-country MNEs are deficient in technological knowledge and thus seek it in more developed countries. Makino, Lau, and Yeh (2002) found in a sample of Taiwanese firms that those motivated by asset-seeking (asset-exploitation) were more (less) likely to choose FDI in more developed countries versus the least developed countries.

At the firm-level, the ability to identify and integrate new knowledge has been described as a firm’s absorptive capacity (Cohen and Levinthal, 1990). Firms with greater technological capabilities, often proxied by R&D intensity (Caves, 1996; Chung and Alcácer, 2002; Cohen and Levinthal, 1990), are viewed as having greater levels of absorptive capacity. Because of this, multinationals with greater R&D intensity likely are more competitive in the bidding process to acquire firms in developed countries. This is because these R&D-intensive multinationals possess greater absorptive capacity and can more effectively integrate externally acquired knowledge. FDI for knowledge seeking, therefore, is akin to seeking knowledge resources in strategic factor markets (Barney, 1986). If R&D-intensive multinationals are more competitive in competitive bidding in strategic factor markets for technological knowledge in developed countries, because they possess greater absorptive capacity, then these multinationals are more likely to choose FDI in developed (Northern FDI) rather than in developing (Southern FDI) countries.

*Hypothesis 2: Higher R&D intensity by multinationals increases the likelihood of Northern FDI, defined as FDI in developed rather than in developing countries.*

The likelihood of a multinational choosing a developed country, presumably for knowledge-seeking, is not just driven by firm-specific factors such as R&D intensity, but also by industry-specific factors. In particular, multinationals that compete in high-tech industries are more likely to engage in Northern FDI. First, pioneering technological knowledge has existed more prominently in developed rather than in developing countries (Awate, Larsen, and Mudambi, 2012). Second, multinationals that compete in high-tech industries rely on innovative products and product designs (Hecker, 1999), and externally acquired technological resources can lead to profitability (King, Slotegraaf, and Kesner, 2008). Therefore, firms competing in those industries in which innovative technology is more important for firm-level competitive advantage will likely choose Northern FDI. Therefore, we expect that multinationals competing in high-tech industries more likely choose developed countries for FDI (Northern FDI).

*Hypothesis 3: Multinationals competing in high-technology industries are more likely to engage in Northern FDI, defined as FDI in developed rather than in developing countries.*

Finally, we consider together firm-specific R&D intensity and industry-specific competition in high-tech industries. Combining these theoretical elements leads us to the proposition that firms in high-tech industries that *also* have high R&D intensity are even more likely to engage in Northern FDI. Firms in high-tech industries are characterized by a relatively large number of employees in devoted to technological and scientific advances (Hecker, 1999). Given a firm operates in a high-tech industry, if that firm then has a relatively high level of investment in R&D then the likelihood of engaging in FDI in a developed rather than in a developing country is magnified. In effect, we propose a positive interaction effect between R&D intensity and competing in a high-tech industry on the likelihood of Northern FDI.

*Hypothesis 4: Higher R&D intensity and competing in a high-technology industry will interact positively in affecting the likelihood of Northern FDI, defined as FDI in developed rather than in developing countries.*

## **Methodology**

### **Sample and Data Sources**

To test our hypotheses, we obtained a sample of FDI investments by multilatinas announced between 1998 and 2013 from the Securities Data Corporation (SDC) mergers and acquisitions database provided by Thomson Reuters. An MNE is defined as a multilatina if it is domiciled in any country in South America, Central America or the Caribbean. MNEs from Mexico, often categorized as North America, are also considered multilatinas. This categorization is consistent with Cuervo-Cazurra (2010).

To obtain firm-level data, we merged data from the SDC database using the firm identifier “SEDOL” (Stock Exchange Daily Official List) with data obtained from the Compustat Global database provided by Standard and Poor’s. Based on this data collection strategy and availability of both FDI data from SDC and firm-level data from Compustat Global, we arrived at final sample of 124 investments by 22 multilatinas located in Brazil, Chile, and Mexico. Alpek, the Mexican chemical company. Table 1 lists these multilatinas and their home country and primary industry. We describe all variables in the next section. The SDC database provided data to develop our measures of the variables *Northern FDI*, *Northern FDI Experience* and *Same Industry*. The Compustat Global database provided data to develop our measures of the variables *Labor Intensity*, *R&D Intensity*, *High-tech Industry*, *Multilatina Size*, and *Financial Slack*.

### **Variables and Measures**

Our dependent variable, *Northern FDI*, equals one (and zero otherwise) if the target firm is located in a highly developed country as indicated by the World Bank’s list of high income members of the Organisation for Economic Co-operation and Development (OECD). These countries are Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Slovenia, South Korea, Spain, Sweden, Switzerland, United Kingdom, and the United States. Note in this list, for example, that South Korea is included though Taiwan and Singapore are not included. These three countries are often considered “newly-industrialized economies”.

We used three variables for the main tests of our hypotheses. First, we measured *Labor Intensity* as the inverse of property, plant, and equipment expenses divided by revenues (Erramilli et al., 1997). Second, we measure *R&D intensity* as

the multilatina's R&D expenses divided by its revenues, a measure widely used in existing empirical research (e.g., Franko, 1989; Graves, 1988; Lee and O'Neill, 2003). *Labor Intensity* and *R&D Intensity* are measured one year prior to the announcement date of the foreign investment. Third, we measure whether the multilatina competes in a high-tech industry based on its primary three-digit SIC. In particular, *High-Tech Industry* equals one (and zero otherwise) if the three-digit SIC is located in a high-tech industry, according to Hecker (1999). The test for hypothesis four requires an interaction term of *R&D intensity\*High-tech Industry*.

We also included several control variables. We included year fixed effects of the announcement year of the investment and home-country fixed effects. We controlled for firm-specific variables that might affect location decisions. We controlled for the size of the multilatina, *Multilatina Size*, which was measured as the natural logarithm of total revenues in \$US in the year prior to the year of the investment. We included a measure of the multilatina's financial slack resources, *Financial Slack*, which was measured as cash and short term investments divided by its liabilities (Greeve, 2003; Kim, Kim, and Lee, 2008). We also included a control indicating whether the investment was in the same industry as the multilatina's primary industry. *Same Industry* equals one (and zero otherwise) if the primary three-digit SIC of the multilatina was the same as the primary three-digit SIC of the target firm. We also included the extent of the multilatina's previous FDI experience in developed countries. *Northern FDI Experience* is measured as the number of international investments in a developed country prior to the focal investment, as indicated by data from the SDC database. Table 2 contains descriptive statistics and pair-wise correlations.

-----Insert Table 1 Approximately Here-----

### Estimation Techniques

To test our four hypotheses, we define the following empirical equation:

$$\begin{aligned}
 NorthernFDI_{ijklt} = & \alpha + \gamma \sum_{\gamma=1}^{\gamma=4} Controls + \tau \sum_{\tau=1999}^{\tau=2013} Years + \rho \sum_{\rho=1}^{\rho=2} HomeCountries \\
 & + \beta_1 LaborIntensity_{jkl,t-1} + \beta_2 R\&DIntensity_{jkl,t-1} + \beta_3 HighTechIndustry_{jkl,t-1} \\
 & + \beta_4 R\&DIntensity_{jkl,t-1} * HighTechIndustry_{ikl,t-1}
 \end{aligned} \tag{1}$$

In Equation 1, the dependent and independent variables correspond to those described above. The dependent variable, *Northern FDI*, indicates whether foreign direct investment *i*, undertaken by multilatina *j*, domiciled in home country *k*, operating in industry *l*, and announced in year *t* was undertaken in a developed country. Because the dependent variable is binary (0-1), we used a logistic (logit) estimator as our principal estimator. To address the likelihood that individual multilatinas in our sample may share characteristics not captured by our firm-specific variables, we included robust (to heteroscedasticity) standard errors clustered by individual multilatina that accounts for possible non-independence within multilatinas.

## Results

### Primary Regression Results

Columns 1 and 2 in Table 3 report primary regression results to test our four hypotheses. (Columns 3-9 examine robustness and sensitivity of these primary regression results.). In Column 1, we observe that the coefficient for *Labor Intensity* is negative and statistically significant at the 1% level ( $p < 0.01$ ), a result consistent with Hypothesis 1. Greater labor intensity by multilatinas appears to decrease the likelihood of *Northern FDI*, which means a higher likelihood of FDI in other developing rather than in developed countries. Next, we turn to results for understanding firm- and industry-specific effects on the likelihood of Northern FDI. We observe a statistically insignificant coefficient for *R&D Intensity*, which does not lend support to Hypothesis 2. Next, we observe that the coefficient for *High-tech Industry* is positive and statistically significant at the 5% level ( $p < 0.05$ ), a result consistent with Hypothesis 3.

-----Insert Table 2 Approximately Here-----

Yet, we also hypothesized an interactive effect between *R&D Intensity* and *High-tech Industry* (Hypothesis 4). And Column 4 reports these results. Consistent with Hypothesis 4, we observe a coefficient for *R&D Intensity X High-tech Industry* that is positive and statistically significant at the 5% level ( $p < 0.05$ ). We illustrate this interactive effect, in Figure 1, by showing the marginal effect of *High-tech Industry* on *Northern FDI* for different values of *R&D intensity*. We observe that as *R&D intensity* increases, the likelihood of *High-tech Industry* affecting the likelihood of *Northern FDI* also increases, which provides further support of Hypothesis 4.

-----Insert Figure 1 Approximately Here-----

#### ***Robustness and Sensitivity of Primary Regression Results***

Columns 3-9 in Table 3 report results assessing the robustness and sensitivity of our primary regression results, focusing principally on unique country effects and multilatina-specific effects. That is, we examine whether our main results that collectively sample multilatinas from Brazil, Chile and Mexico are unique to one of these particular countries. We then modify the way we account for within firm homogeneity by using firm (multilatina) fixed effects as opposed to clustering on firms as we did in our primary analysis.

Columns 3-4 are just like the estimations in Columns 1-2, except the sample consists only of multilatinas from Brazil. These multilatinas represented the largest single-country sample (77 observations), sufficient to perform Brazil-only estimations. Consistent with our main results, we again observe a coefficient for *Labor Intensity* that is negative and statistically significant at the 1% level ( $p < 0.01$ ), a coefficient for *R&D Intensity* that is statistically insignificant, and a coefficient for *High-tech Industry* that is positive and statistically significant at the 10% level ( $p < 0.10$ ). In Column 4, we again observe a positive coefficient for the interaction of *R&D Intensity* and *High-tech Industry* though this time the coefficient loses statistical significance at commonly accepted levels ( $p = 0.165$ ). However, the graphical illustration in Figure 2 shows the marginal effects of *High-tech Industry* at different levels of *R&D Intensity*. Figure 2 is similar to Figure 1. The only difference is that Figure 2 examines effects using only the sample of Brazilian multilatinas.

-----Insert Figure 2 Approximately Here-----

Again, we observe a similar pattern. The only difference is that in the Brazil-only sample, *High-tech Industry* loses statistical significance at the 10% level or greater for extremely low values of *R&D Intensity*. Further, the effect of high-tech industry on Northern FDI for Brazilian multilatinas does not increase at the same rate for increasing levels of R&D intensity. Yet, the general trend is qualitatively equivalent to the full sample of multilatinas from Brazil, Chile and Mexico.

Columns 5 and 6 modify the approach to examine country-specific differences. Column 5 (Column 6) reports results of interacting a dummy variable for Brazilian multilatinas (Mexican multilatinas) with the three key explanatory variables: *Labor Intensity*, *R&D Intensity* and *High-tech Industry*. In effect, these interactions tease out any differences between Brazilian multilatinas compared to a combined sample of Chilean and Mexican multilatinas (Column 5) and between Mexican multilatinas compared to a combined sample of Brazilian and Chilean multilatinas (Column 6). We do not interact a Chilean multilatina dummy. As we noted, only one of the 16 Chilean multilatina observations engaged in Northern FDI. In Columns 5-6, we do not expect to observe statistically significant effects for any of these interactions, because our theoretical perspective and developed hypotheses are intended not to distinction between multilatinas from different countries. Nonetheless, for the sake of comprehensiveness, we estimate regressions to tease out potential country-level effects. We do not observe any statistically significant interactive coefficients, as we expected, with the exception of the interaction of *Labor Intensity* and Mexican multilatina. It appears that the effect of labor intensity on Northern FDI for Mexican multilatinas is even less likely than for the collective sample of Brazilian and Chilean multilatinas.

Columns 7 and 8 report results without including Chilean multilatinas, which means estimations are just for Brazilian and Mexican multilatinas. Again, the results are qualitatively equivalent. Finally, Column 9 modifies the way we address non-independence of effects due to observations of the same multilatina. As we noted, our sample of 124 observations includes 22 multilatinas. Instead of clustering on multilatina as we did in previous estimations, we include a dummy variable for each multilatina. One effect of doing this is that all multilatinas that always choose either Northern or Southern FDI are dropped from the regression. This happened, and the resulting sample is 98 observations. We note the slightly lower statistical significance of *Labor Intensity* ( $p = 0.118$ ). Coefficients for *R&D Intensity* and for *High-tech Industry* are similar to our previous results. We did not achieve convergence of the Logit model when we interacted *R&D intensity* with *High-tech Industry* for the specification including these multilatina dummies. Overall, our results appear to be robust to reasonable variation in the way we handled country- and firm-effects in our estimations.

## **Discussion and Conclusion**

### ***Key Findings and Implications***

Our aim has been to contribute to existing global strategy and IB research literatures by theorizing and testing determinants of multilatinas' choice of FDI in developed (Northern FDI) versus developing (Southern FDI) countries. We found firm- and industry-specific characteristics of multilatinas that were associated with both Northern and Southern FDI. Higher levels of labor intensity by multilatinas were associated with a higher likelihood of Southern FDI. Multilatinas that compete in high-

tech industries were, in contrast, more likely to engage in Northern FDI. We also found a positive interactive effect between competing in a high-tech industry and high levels of R&D intensity. That is, for multilatinas with high R&D intensity and which compete in a high-tech industry, the likelihood of Northern FDI was magnified. The firm-specific characteristic of R&D intensity and the industry-specific characteristic of high-tech both relate to a firm's ability and motivation to seek new knowledge in developed countries.

Our study has several implications for theoretical research, empirical research and managers. We have identified whether and how particular firm-specific characteristics of multilatinas affect the tendency to seek FDI in developed versus developing countries. In doing so, we contribute to existing research literature focused on understanding which firm-specific assets drive competitiveness in which types of foreign locations, and therefore which foreign countries multilatinas, and likely other developing-country MNEs, choose to invest. At a theoretical level, simply understanding the linkage (and cause-effect relationship) between distinct assets of firms and where firms choose to invest provides insight into the types of competitive advantages firms have, or are pursuing. High labor intensity suggests the development and production of products that have the right mix of price and quality that may be more competitive, because they are more demanded, in other developing countries.

At the industry-level, that multilatinas competing in high-tech industries are more likely to engage in Northern FDI, even after controlling for labor intensity and other firm-specific factors, is telling. It is not only that all multilatinas are not the same in terms of FDI location choice but also which distinct firm- and industry-specific characteristics drive these differences. Further, that the effect of high-tech industry on Northern FDI tendency is amplified by high R&D intensity further strengthens the view of knowledge-seeking FDI by multilatinas. Ramamurti (2012) called "puzzling" the surge of internationalization by emerging market multinationals given their relative lack of firm-specific or ownership advantages. Our study suggests that highly labor intensive multilatinas, compared to developed-country MNEs, may possess relative firm-specific advantages. Our study also suggests that R&D intensity may provide technological capabilities sufficient to compete successfully in strategic factor markets (Barney, 1986) for knowledge-based resources in developed countries.

#### ***Limitations and Future Research***

Like all studies, ours has limitations, but which also suggest future research. First, we have categorized FDI by multilatinas into two groups, Northern and Southern FDI. While this approach does address the types of issues we are concerned with in our study, namely the types of firm- and industry-specific characteristics that would push multilatinas to pursue Northern versus Southern FDI, the approach is certainly somewhat coarse. That is, we could learn more about multilatina FDI location decisions by a more nuanced approach to not only parsing out countries more finely, but also observing which locations within particular countries are chosen, and how this choice is connected to firm-specific characteristics. Second, we considered just a few firm- and industry-specific characteristics shaping multilatina FDI location choices. To be sure, there

are other important factors, which might be measurable indicators like the unique product mix of multilatinas, or which might be other factors like motivation that could be measured through surveys filled out by multilatina managers.

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Table 1. List of Multilatinas

<b>Multilatina Name</b>	<b>Home Country</b>	<b>Primary Industry</b>
Alpek	Mexico	chemicals
Alfa Group	Mexico	petrochemicals
Alpargatas	Brazil	shoes
BRF	Brazil	food products
Brasilagro	Brazil	agriculture
Braskem	Brazil	petrochemicals
CCR	Brazil	transportation
CPFL Energia	Brazil	energy
Cemex	Mexico	cement
Compañía General de Electricidad	Chile	energy
Embraer	Brazil	aerospace
Enersis	Chile	energy
Falabella	Chile	retail
Gruma	Mexico	food products

Grupo Kuo	Mexico	consumer goods, chemicals
Industrias Romi	Brazil	machine tools
		commercial refrigeration
Metalfrio Solutions	Brazil	products
Petrobras	Brazil	energy
Sonda	Chile	information technology services
Totvs	Brazil	software
Ultrapar	Brazil	fuel distribution
Vale	Brazil	mining

Table 2. Descriptive Statistics and Pair-wise Correlations for Analyses of Multilatinas' Northern FDI (i.e., FDI in Developed Countries), 1998-2013<sup>a</sup>

	Mean	S.D.	Min	Max	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) Northern FD	0.42	0.50	0.00	1.00	1.00										
(2) Multilatina Size	9.56	1.39	4.34	11.78	0.13	1.00									
(3) Same Industry	0.31	0.46	0.00	1.00	0.07	-0.05	1.00								
(4) Financial Slack	0.18	0.14	0.00	0.83	-0.08	-0.12	0.23	1.00							
(5) Northern FDI Experience	13.71	12.35	0.00	42.00	0.29	0.54	-0.21	-0.28	1.00						
(6) Labor Intensity	-0.89	0.56	-2.37	-0.04	-0.26	-0.52	0.26	0.21	-0.68	1.00					
(7) R&D Intensity	0.01	0.01	0.00	0.12	0.18	-0.03	0.06	0.39	0.17	-0.31	1.00				
(8) High-tech Industry		0.35	0.48	0.00	1.00	0.03	0.32	0.40	0.31	-0.13	0.27	-0.01	1.00		
(9) Brazilian Multilatina	0.65	0.48	0.00	1.00	0.12	0.43	0.05	0.40	0.02	-0.21	0.41	0.29	1.00		
(10) Chilean Multilatina	0.13	0.34	0.00	1.00	-0.28	-0.31	0.11	0.04	-0.43	0.12	-0.20	-0.08	-0.52	1.00	
(11) Mexican Multilatina	0.23	0.42	0.00	1.00	0.09	-0.24	-0.15	-0.49	0.32	0.15	-0.31	-0.27	-0.73	-0.21	1.00

<sup>a</sup> Table 2 reports descriptive statistics and pair-wise correlations for all variables used in primary regression and robustness and sensitivity regression analyses. N= 124 for all variable pair-wise correlations. Correlations greater than 0.25 or less than -0.25 are significant at  $p < 0.01$ . Correlations greater than 0.19 or less than -0.19 are significant at  $p < 0.05$ . Correlations greater than 0.16 or less than -0.16 are significant at  $p < 0.10$ . Correlations for year and home-country dummies are not reported here but are available from the authors.

Table 3. Regression Results of Multilatinas' Northern FDI (i.e., FDI in Developed Countries), 1998-2013<sup>a</sup>

Independent Variables	Equation Estimator and Sampling								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Logit	Logit	Logit	Logit	Logit	Logit	Logit	Logit	Logit
			Only	Only	Brazil		Without	Without	Chile
				Brazil			Chile		
Multilatina Size	-0.83** (0.389)	-1.13** (0.509)	-0.62 (0.597)	-1.39* (0.775)	-0.98* (0.551)	0.05 (0.500)	-1.12** (0.501)	-1.38** (0.578)	-8.88** (3.451)
Same Industry	0.81 (0.944)	0.78 (1.003)	-0.00 (0.877)	-0.17 (0.967)	0.69 (0.968)	0.68 (0.954)	0.84 (1.025)	0.77 (1.108)	-0.77 (0.859)
Financial Slack	-0.47 (2.251)	-2.60 (3.209)	-3.25 (2.785)	-10.06*** (3.127)	-5.29* (3.197)	-1.80 (3.385)	-3.21 (2.730)	-6.02 (4.039)	7.33 (12.802)
Northern FDI Experience	0.01 (0.041)	0.02 (0.043)	-0.15** (0.069)	-0.10 (0.071)	0.09* (0.045)	-0.05 (0.056)	0.05 (0.050)	0.05 (0.051)	-0.45* (0.273)
Labor Intensity	-2.95*** (0.681)	-3.73*** (0.879)	-3.06*** (0.790)	-4.08*** (1.167)	-2.20* (1.172)	-1.53** (0.637)	-2.51*** (0.755)	-3.28*** (0.948)	-7.17 (4.589)
R&D Intensity	-6.94 (20.563)	-62.60 (39.323)	28.79 (23.178)	-69.45 (43.077)	-130.19 (228.396)	54.97 (52.156)	0.20 (24.512)	-57.80 (38.316)	-233.62 (175.476)
High-tech Industry	2.03** (0.847)	1.63** (0.743)	2.61* (1.362)	1.52 (2.056)	1.54* (0.914)	1.18 (0.833)	2.66*** (0.960)	2.12*** (0.791)	5.96* (3.375)
R&D Intensity X High-tech Industry		95.68** (45.557)		233.23 (168.134)				100.49** (43.326)	
Brazilian Multilatina	-0.80 (0.807)	0.28 (1.090)			1.90 (1.225)		-0.09 (0.902)	1.11 (1.262)	-22.64** (10.432)
Chilean Multilatina	-4.22*** (1.169)	-4.24*** (1.139)							-30.42** (14.788)
Labor Intensity X Brazilian Multilatina					1.29 (1.064)				
R&D Intensity X Brazilian Multilatina					144.16 (220.385)				
High-tech Industry X Brazilian Multilatina					0.66 (1.288)				
Mexican Multilatina						-1.18 (1.667)			
Labor Intensity X Mexican Multilatina						-3.52** (1.741)			
R&D Intensity X Mexican Multilatina						493.36 (553.413)			
High-tech Industry X Mexican Multilatina						0.02 (1.140)			
Constant	5.52* (3.210)	8.09* (4.179)	2.96 (4.425)	9.44 (6.807)	6.29 (4.764)	-3.10 (4.523)	7.27* (3.909)	9.55** (4.638)	101.03*** (36.115)
Year fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	124	124	77	77	124	124	108	108	98

<sup>a</sup>Table 3 reports coefficients and robust standard errors (in parentheses) from Logit regression of multilatina FDI in a developed country (*Northern FDI*) on right-hand side variables in Equation 1. Coefficients and robust standard errors for year and home-country dummies are not reported but are available from the authors. Logit refers to logistic regression estimation with clustering on countries.

\*\*\* p < 0.01, \*\* p < 0.05, \*p < 0.10

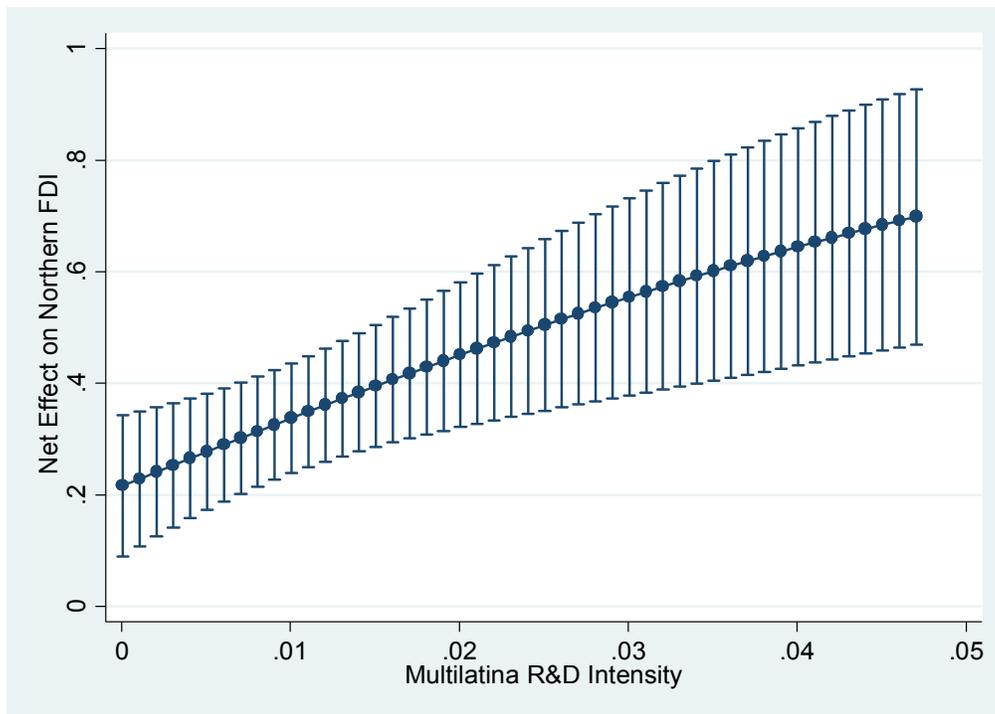


Figure 1. Average marginal effects of *High-tech Industry* on the effect of Northern FDI (i.e., in developed countries) for different values of multilatina *R&D Intensity*. (Multilatinas include firms from Brazil, Chile and Mexico.)

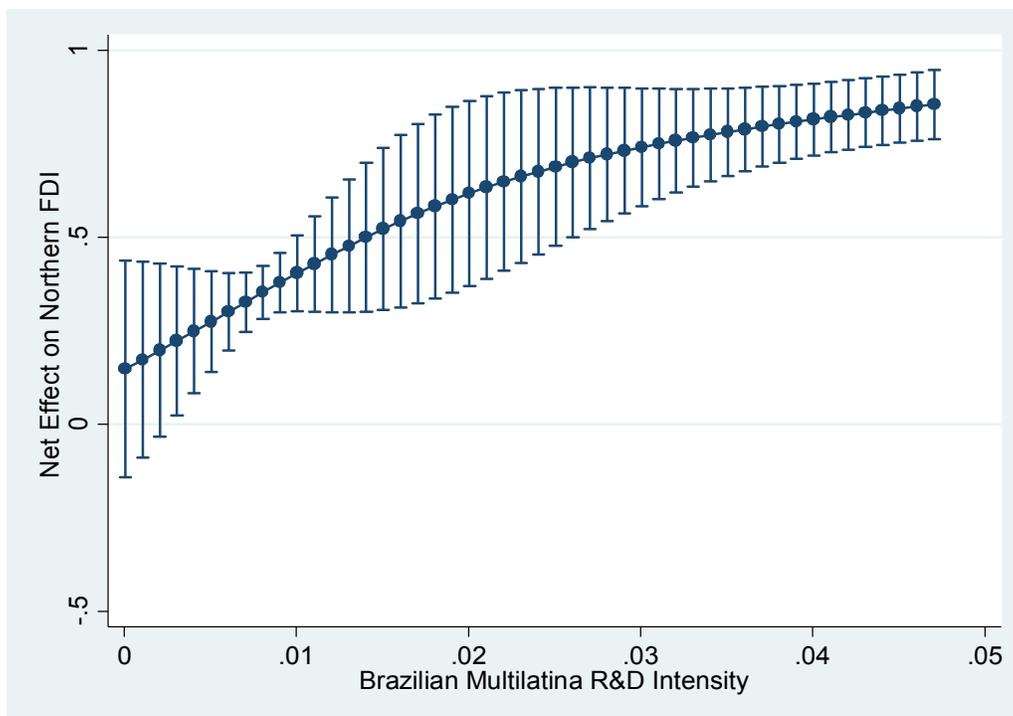


Figure 2. Average marginal effects of *High-tech Industry* on the effect of Northern FDI (i.e., in developed countries) for different values of Brazilian multilatina *R&D Intensity*