Vertical FDI? A Host Country Perspective

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Abstract

Recent empirical studies of the determinants of multinational activity across countries have found overwhelming support for a horizontal rather than a vertical model of foreign direct investment (FDI). They all use U.S. or other developed country data. This paper, in contrast, uses a previously unexploited industry-level data set on FDI in a relatively skilled-labor and capital scarce country, Mexico, to shed light on the determinants of FDI between largely dissimilar countries. The results indicate considerably more support for the vertical model. The correlation between skill differences and FDI is positive in all industries, but when differences are large, FDI flows into sectors that are intensive in total labor, regardless of skill level. The concentration of multinational activity in (unskilled) labor intensive industries suggests a limited potential for spillover effects.

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1 Introduction

Recently, foreign direct investment (FDI) has received significant attention for a variety of reasons. First, its growth has far outpaced growth in either world production or world trade in recent years. While merchandise trade grew about 85 percent, and world production grew 27 percent, world FDI flows increased by 535 percent during the 1990s. Remarkably, developing countries benefitted disproportionately, raising their share of the world inward stock of FDI from 20.6 percent in 1990 to over 30 percent in 1999 (Youssef 1998; UNCTAD 2000, 2001). Second, many developing countries are actively seeking to attract more foreign investment, especially in the form of direct investment which is perceived to be more stable than portfolio investment. For many, this represents a reversal of policies that severely regulated and often discouraged FDI. Presumably, the motive for seeking more FDI is its function as a catalyst of development. Positive welfare effects stem from increased employment, forward and backward linkages, and technological spillovers.

The probability of such welfare improvements, and technological spillovers in particular, however, crucially depends on the type of multinational. Horizontal multinationals, which are those that roughly duplicate production in multiple locations, are much more likely to provide these benefits than vertical multinationals, which arise due to differences in factor endowments, absent international factor price equalization.[1] In that case, unskilled-labor intensive and technologically unsophisticated parts of the production process are located in unskilled–labor abundant countries with less potential for spillovers and linkages.

Early theoretical analyses of the multinational firm considered FDI as determined by ownership, location, and internalization advantages (introduced by Dunning 1977). Recent theoretical

[1] The distinction between horizontal and vertical multinationals is due to Caves (1971).

treatments have instead built general equilibrium models in which multinationals arise endogenously. While the early literature has treated horizontal (Markusen 1984) and vertical (Helpman 1984) multinationals separately, recent work has provided a unified framework (Markusen 1997; Markusen 2002; see Markusen and Maskus 2001 for an excellent survey). When the theory is taken to the data, the vertical model is overwhelmingly rejected in favor of the horizontal one (Carr et al. 2001; Markusen and Maskus 2002; Blonigen et al. 2003). Using different terminology, Brainard (1997) similarly finds support for the proximity-concentration, but not the factor-proportions hypothesis. Only a few studies, e.g. Braconier et al. (2002) and Yeaple (2003), have found some support for the vertical model.

The rejection of the vertical model is puzzling not only because of the increased share of developing countries as recipients of FDI, but in light of recent findings that explain much of the growth in world trade with increasing vertical specialization (Hummels et al. 2001; Yi 2003), which implies that trade and FDI are complements. A possible source of bias in the above cited studies is that they all use data on FDI originating in or targeted at developed countries, usually the United States. Most of this FDI flows to or comes from other developed countries, in which case horizontal multinationals would indeed be expected to dominate despite the presence of some developing partner countries. Using a previously unexploited industry-level data set, this paper in contrast examines the determinants of FDI in a developing country, Mexico. By focusing on a comparatively skilled-labor and capital scarce host country, one would expect considerably more support for the vertical model. While this would cast some doubt on the result that worldwide FDI is dominated by horizontal multinationals, we regard our results as complementary to the empirical work cited above, not as evidence against the finding that horizontal multinationals are important.

In addition to providing a different perspective from which to approach the question which model of the multinational firm finds more support in the data, this paper contributes to our understanding of the determinants and desirability of FDI in developing countries more generally. Mexico presents an interesting case not only due to its proximity to the United States, but also because it is arguably at an intermediate stage of development.[2] Hence, its comparative advantage may no longer solely arise from an abundance of unskilled labor, but the availability of relatively more skilled labor than other developing countries as well as positive externalities from decades of foreign investment and agglomeration effects. There is some evidence that foreign firms increasingly penetrate capital- and skilled-labor intensive production, especially since the inception of the North American Free Trade Agreement (NAFTA) in 1994, which coincides with the beginning of our sample period.[3]

Finally, the availability of host country industry-level information not only on FDI, but factor intensities and other characteristics allows identification not only of country-aggregate, but also industry-specific determinants of FDI and any interactions between them, unlike many of the previous studies (e.g. Carr et al. 2001, Markusen and Maskus 2002, Blonigen et al. 2003).

The results of the empirical analysis lend some support to the hypothesis that inward FDI in Mexico is not solely determined by a comparative advantage in unskilled-labor intensive production processes. There is evidence of the presence of both a market access and a comparative advantage motive, although there is stronger support for the latter. Differences in skill endowments relative to source countries are significant determinants of FDI. However, when these differences are very large, FDI flows into sectors that are intensive in total labor, regardless of skill level. Overall, these results provide indirect evidence that the expected benefits from

[2] The World Bank now classifies Mexico as an upper middle-income economy.

[3] General Motors' recent opening of an automatic transmission plant, which is relatively skilled-labor intensive, represents some anecdotal evidence.

foreign direct investment may be rather limited.

The paper proceeds as follows. The next section describes the main features of the FDI data and provides some additional information on FDI in Mexico. Section 3 lays out the conceptual framework guiding the empirical estimation, which is described in more detail in section 4, followed by a discussion of the results. Section 6 offers concluding remarks.

2 FDI in Mexico

Since the data used in this study are not familiar, they are described in some detail here. FDI data come from the Mexican Ministry of Trade and Industrial Development (SECOFI). These are nominal FDI inflows into Mexico in U.S. dollars from 1994 to 2000.[4] The data are at the 4-digit industry level, using the Mexican Industrial Classification System (CMAP), which is very similar to the 1968 International Standard of Industrial Classification. Table 1a shows summary statistics, broken down by major industry; Table 1b shows the corresponding shares. Just over 60 percent of FDI has gone into the manufacturing sector during this seven-year period. Wholesale and retail trade as well as financial services also received substantial amounts. Table 2 shows that within the manufacturing sector, the bulk of FDI goes into production of metal products, including automobiles. Thus not surprisingly, many automobile manufacturers, such as General Motors, Ford, DaimlerChrysler and Volkswagen, are among the largest foreign investors.

For the entire sample period, FDI inflows fluctuate around $10 billion per year. This is considerably more than Mexico received on an annual basis prior to 1994. Foreign investment flows were low for much of the 1980s. The first substantial increase in FDI in the late 1980s and early 1990s coincided with a major overhaul of Mexico's investment laws in 1989. Many obstacles to

[4] These are converted to real flows in the estimation below.

foreign investors, such as licensing requirements and restrictions pertaining to majority ownership, were removed. This change reversed Mexico's long-standing policy of reserving ownership in many sectors to Mexican nationals or the Mexican state and encouraging foreign investment only in sectors that were deemed crucial to the pursuit of import substitution policies.[5] At the same time, and earlier than in many other countries in the region, substantial privatizations occurred. By 1994, the number of state-owned enterprises had decreased to only 80, down from 1155. However, foreign investors participated in this sale only to a small degree. FDI from privatization constituted only 7.9 percent of total FDI between 1990 and 1995 (Franko 1999: 158-61). Yet, during the first half of the 1990s, Mexico was the major recipient of FDI in Latin America, with a big surge occurring in 1994 after the inception of NAFTA.

Since Mexico joined both NAFTA and the OECD in 1994, it is likely that a break occurs in the FDI series in that year.[6] Hence, having 1994 as the beginning of the sample period avoids any bias arising from such a break. Moreover, the same kind of detailed information on inward FDI in Mexico is not available prior to 1994 because Mexico changed how FDI information is recorded starting in that year, now complying with World Bank standards.

Table 3 shows the source country shares of FDI inflows. Most FDI comes from the United States, with European Union countries a distant second. The only other major source countries of FDI are Japan and South Korea. Not surprisingly, investments from developed countries vastly dominate Mexican inward FDI with negligible amounts from developing countries.[7]

[5] Multinational corporations were welcomed as providers of technology. In 1970, their share exceeded 50 percent in the transportation equipment, electrical machinery, and chemical industries (Franko 1999: 62).

[6] Waldkirch (2003), who examines the effect of NAFTA on Mexican FDI, finds evidence of such a break.

[7] The data show the volatile nature of FDI flows, which in a given year can be dominated by just one outlier. The large share of developing countries in 1994 is almost entirely due to the acquisition of the steel company SICARTA by the Indian company ISPAT for more than $1.5 billion. The low share of EU countries in 2000 is due to the French Telekom selling its $2.5 billion stake in the Mexican telephone company TELMEX which it had acquired ten years earlier.

3 Conceptual Framework

This section discusses the conceptual framework that forms the basis for the empirical estimation. The theoretical determinants of FDI, in particular those that matter for horizontal versus vertical multinationals are drawn from the literature, mainly from the seminal study by Brainard (1997) and the pioneering work of Markusen (1997) and Markusen (2002), which was put to an empirical test in Carr et al. (2001) and Markusen and Maskus (2002).

Markusen (2002) refers to his unified approach as the "knowledge-capital model" of the multinational enterprise. This model entails as special cases those of horizontal and vertical multinationals, as well as purely national firms. It draws its name from the assumption that headquarter services (e.g. R&D) can be geographically separated from production activities and supplied simultaneously to several production facilities at low cost. This implies that production is characterized by increasing returns to scale. In the two-country model, horizontal multinationals are then firms with production plants in both countries, but headquarters located in only one. Vertical multinationals have a single plant in the country that does not host the headquarters. Finally, national plants maintain a single plant and headquarters in the same country and may or may not export to the other country. The ordering of skill-intensities in the economy is such that headquarter services are more skilled-labor intensive than production, which in turn is more skilled-labor intensive than the rest of the economy. Finally, it is assumed that national goods markets are segmented.[8]

Since the model is very complex, simulations are necessary to determine what type of multinational will dominate in equilibrium. Market size will encourage both knowledge-capital and horizontal type multinationals, but should have no independent effect on vertical multinationals.

[8] See Markusen (2002) for full details of the model.

Motives for the latter arise primarily from differences in relative endowments among countries. If countries differ sufficiently with respect to their endowments such that they are in different cones of diversification, the skilled-labor abundant country will be the headquarter site, while the unskilled-labor abundant country will have a comparative advantage in hosting the production facility.

Consequently, foreign investment that is based on a comparative advantage motive should flow into industries that are relatively low-skilled labor intensive. Moreover, relative country skill abundance and industry skill intensity should interact if FDI reflects the chain of comparative advantage. From a skilled-labor scarce host country perspective this means that moderately skilled-labor abundant source countries would invest disproportionately in unskilled-labor intensive industries, whereas highly skilled-labor abundant source countries would invest in what are, from their perspective, relatively unskilled-labor intensive industries, but from the host country perspective could be relatively skilled-labor intensive industries. This is because, as pointed out by Feenstra and Hanson (1997), the range of goods produced in a skilled-labor abundant country encompasses more skilled-labor intensive industries whereas the range of goods produced in a skilled-labor scarce country encompasses more unskilled-labor intensive industries. Hence, what passes as skilled-labor intensive in one country appears relatively unskilled-labor intensive in another.

Other industry characteristics influencing inward foreign investment are capital intensity, plant and corporate scale economies and the degree of concentration. In a world with, say, three factors, skilled labor, unskilled labor, and capital, an unskilled-labor abundant country has a comparative advantage not only in industries characterized by a low share of skilled workers, but also low capital intensity. The knowledge-capital model as well as Brainard (1997)

and others emphasize the positive effect of corporate scale economies on FDI as headquarter services can be spread across many plants, but the negative effect of plant scale economies since these encourage concentration in just one place of production. Finally, multinationals tend to operate in imperfectly competitive industries with positive profits and hence a high degree of concentration in an industry would also encourage FDI.

The final elements that impact FDI in this framework are transport and more generally trade and investment costs. If transport costs are low, a firm might substitute exports for foreign production. Parent country trade costs should have a negative effect on multinational activity of all types since exporting back to the home country from a foreign country would be more costly relative to home production. Host country trade costs, on the other hand, should encourage multinational activity, the well-known tariff-jumping argument. Host country investment costs should have a negative effect.

The next section describes the empirical implementation of the theory and discusses some econometric issues.

4 Empirical Framework

4.1 The Empirical Model

The basic estimating equation is as follows:

$$\begin{aligned} FDI_{ijt} &= \beta_1 GDP_{jt} + \beta_2 MexGDP_t + \beta_3 FDIaglom_{it} + \beta_4 diffskill_{jt} + \beta_5 skillintensity_{it} \\ &\quad + \beta_6 \left(diffskill * skillintensity\right)_{ijt} + \beta_7 numfirms_{it} + \beta_8 firmsize_{it} + \beta_9 klratio_{it} \\ &\quad + \beta_{10} invcostmex_t + \beta_{11} openmex_t + \beta_{12} openpar_{jt} + \beta_{13} distance_j + \varepsilon_{ijt} \end{aligned} \tag{1}$$

The subscripts indicate each regressor's variation over time (t), across industries (i) and

source countries (j). Source country variables (GDP, skill differences with Mexico, trade openness and distance) do not vary across industries. Mexican aggregate variables (GDP, investment costs and trade openness) vary only year-by-year. Industry variables include measures of factor intensity (skilled-labor and capital intensity) and proxies for corporate and plant scale economies. The interaction between skill differences and skill intensity varies along all dimensions.

Parent country GDP is expected to be positive as larger countries tend to have more outward FDI in absolute terms. A positive coefficient on Mexican GDP would indicate horizontal multinationals whose presence is encouraged by larger market size as output is sold in the host country. An insignificant coefficient would make a case for the dominance of vertical FDI whose presence is encouraged by factor supply differences rather than market size. The inclusion of accumulated FDI recognizes the fact that more FDI tends to flow into industries with a previous presence of foreign investors, due to positive spillover effects or the availability of specialized inputs. Wheeler and Mody (1992), for example, find strong evidence that agglomeration economies positively affect FDI.

The skill abundance and skill intensity measures are crucial for detecting vertical multinational activity. Skill abundance is measured as the difference in the endowment share of skilled labor in the source country and Mexico. Skill intensity is measured as the share of skilled workers in an industry. This is consistent, e.g., with the definition used by Feenstra and Hanson (1997). Skill intensities exhibit substantial heterogeneity across sectors, ranging from just under 5 to over 55 percent skilled labor (see the summary statistics in Table 4). By including an interaction term between the skilled labor abundance of a source country and the skill intensity of an industry, the effect of skill differences is allowed to vary across industries.

The effect of skill differences on FDI is given by

$$\frac{\partial FDI}{\partial diffskill} = \beta_4 + \beta_6 skillintensity \tag{2}$$

If $\beta_4 > 0$ and $\beta_6 < 0$, then greater differences in skill endowments between Mexico and FDI source countries will raise FDI, but less so in more skill-intensive industries. If $\beta_4 < 0$ and $\beta_6 > 0$, then greater differences in skill endowments will tend to lower FDI, but less so in skill intensive industries. In either case, depending on the magnitude of the coefficients, there may be a threshold level of skill intensity at which the total effect switches signs. I.e., in the latter case the total effect may be negative for low skill intensities, but may become positive at high skill intensities. Such a result would suggest that while a vertical motive is present, Mexico does not attract the most unskilled-labor intensive production processes.

The effect of skill intensity of an industry on FDI is given by

$$\frac{\partial FDI}{\partial skillintensity} = \beta_5 + \beta_6 diffskill \tag{3}$$

If $\beta_5 < 0$ and $\beta_6 > 0$, then greater skill intensity of an industry will deter FDI, but less so the greater skill endowment differences between Mexico and the sources of foreign investment. Again, it is possible to calculate a threshold level of skill endowment differences. For small differences (below the threshold level), higher skill intensity will deter FDI, lending support to the hypothesis that FDI is of a vertical nature. For large differences (above the threshold level), higher skill intensity would actually encourage FDI. Such a result would highlight the importance of recognizing that the range of goods produced differs substantially between a skilled-labor scarce and a skilled-labor abundant country.

Since endowment differences are defined as source country minus Mexican relative endowments, differences are positive when the source country is skilled-labor abundant, but negative

when the source country is skilled-labor scarce. In the estimation below, this issue is dealt with in several different ways. First, we interact a dummy indicating whether the parent country is skilled-labor abundant or skilled-labor scarce with the difference measure, in effect entering skill differences separately for the two cases. There are also two interaction terms in that case. Secondly, we take the ratio of skilled to unskilled labor of the source country relative to Mexico, in which case a value below one indicates that the source country is skilled-labor scarce, a value above one indicates that it is skilled-labor abundant.[9]

During the sample period, Mexico's share of skilled labor in the total labor force is about 15 percent, while the corresponding (unweighted) share in the source countries of its FDI is 24 percent. In our data, Mexico is skilled-labor scarce with respect to most source countries. It is skilled-labor abundant only with respect to some smaller developing countries such as El Salvador, Columbia, Costa Rica, Malaysia or Turkey and even in those cases sometimes only for some years of the sample period.

This can be seen in figure 1, which shows FDI observations inserted into an Edgeworth box. Mexico, whose origin is located in the North-East corner, is large relative to most source countries as relative country size roughly changes along the North-East/South-West diagonal and most observations of relative skill endowment are concentrated near the South-West corner. Observations above this diagonal indicate skilled-labor abundant source countries, whereas observations below indicate skilled-labor scarce source countries. Studies such as Carr et al. (2001) that use only U.S. data tend to suffer from the problem that there are few observations in the regions where substantial vertical multinational activity would be expected. This is where endowment differences exist, but country size differences are not too large. Figure 1 shows that this is of no concern here since observations cover a sufficiently large part of the Edgeworth box

[9] Both specifications avoid the potential specification error pointed out by Blonigen et al. (2003).

that the knowledge-capital model would predict the presence of both vertical and horizontal multinationals.

A second measure of factor intensity included in the empirical specification is the capital-labor ratio of a sector, *klratio*, defined as net fixed assets per worker. If differences in factor endowments are the main driving force of foreign capital flows into Mexico, FDI is expected to be directed to sectors with a relatively low capital intensity.[10]

The proxies for plant and firm level scale economies used in the basic specification are average firm size, defined as the value of total gross production divided by the total number of firms, and the total number of firms in an industry. While data availability precludes the use of the same measures used in Brainard (1997), the advantage of our measure is that we use information on scale economies in industries that FDI is actually flowing into. Both Brainard (1997) and Yeaple (2003) use U.S. firm information for outward FDI even though it is well known that industry characteristics may vary across countries within the same industry. Using host country information avoids this problem. As a robustness check, we use the average number of production workers in a plant as a proxy for plant scale economies and the average number of non-production workers as a proxy for firm scale economies.

The measure of Mexican investment cost accounts for both formal investment barriers as well as the overall economic climate that affects the decision where to invest. Source country and host country (Mexican) trade costs are measured by the ratio of exports plus imports to GDP, an often used measure of the trade openness of a country. This measure is used over others since it is available for the entire sample period. Since greater openness corresponds to lower trade costs, a positive sign is expected for parent country, but a negative sign for host country trade costs. Finally, distance is measured as the distance between country capitals. Its sign is

[10] Due to lack of data, no measures of country-level differences in capital abundance are included.

theoretically ambiguous since it can proxy for both trade and investment costs. It is included since it usually performs well in gravity-type models.

The dependent variable in all cases are FDI flows. Many studies use real sales of foreign affiliates, which are more closely related to stocks of FDI than flows. However, this information is not available for the Mexican data at the industry level. Given the length of the sample period, aggregate flows approach the (unobservable) magnitude of stocks, but there is more heterogeneity in the data. This will be apparent in the empirical fit of the regressions below. On the other hand, flows are less likely than stocks to be non-stationary, which usually complicates the empirical analysis. This is especially true when non-stationary independent variables such as GDP are included, which may be cointegrated with a non-stationary dependent variable.

The Data Appendix provides more detailed variable definitions and data sources. Summary statistics can be found in Table 4.

4.2 Econometric Issues

Using investment flows rather than stocks means that there is a prevalence of zeros in the data. Hence, we estimate a tobit model. While FDI flows can be positive or negative for a given industry in a given year, their negative value cannot exceed the stock of FDI. Specifically, let K^* be a latent variable signifying the amount of the desired foreign investment flow. We observe

$$\begin{aligned} K^{flow} &= K^* \text{ if } K^* \geq 0 \\ K^{flow} &= K^* \text{ if } K^* < 0 \text{ and } |K^*| \leq K^{stock} \\ K^{flow} &= -K^{stock} \text{ if } K^* < 0 \text{ and } |K^*| > K^{stock} \end{aligned} \tag{4}$$

where K^{stock} are actual stocks. Unfortunately, no stocks are observed. Therefore, observations are treated as censored if an industry-year-source country observation is zero and there has not

been a positive flow in that industry in a previous time period. If anything, this treats too many observations as censored and results are biased against finding significant effects. As a robustness check, we also estimate fixed-effects and ordinary least squares regressions.

Industry size varies substantially, implying potential heteroscedasticity in the error structure. We deal with this issue by using industry size as weights and estimating robust standard errors. In addition, the inclusion of sector-specific fixed effects in one specification checks the robustness of the results for the non-industry-specific variables.

Since not all regressors vary along all dimensions, disturbances may be correlated within groups. While the coefficients would still be unbiased, they are inefficient and variances and hence standard errors could be biased (Kloek 1981, Moulton 1986). Thus, clustering is taken into account and all estimates are adjusted accordingly. A complicating factor is that there are two clusters: industries as well as source countries. Below, we focus on results that are adjusted for clustering on industry.[11]

5 Results

5.1 Basic Specifications

We first report the results from estimating (1) in levels[12], followed by a battery of robustness checks in the next subsection. The results provide compelling evidence that multinational activity in Mexico is of both the horizontal and the vertical type and point to interesting differences between source countries with different degrees of skilled-labor abundance relative to Mexico.

Column of Table 5 shows results from estimating the full sample. Both source country and

[11] Adjusting for clustering on country rather than industry gives very similar results. If clustering is not taken into account, standard errors are substantially smaller in the case of many regressors.

[12] Using logs is problematic due to the many zeros and some negative values. While zero observations could be set to 1 so that $\ln(1) = 0$, negative observations would have to be dropped.

Mexican GDP are positive and significant at the one and five percent level, respectively. This is consistent with the importance of market size as both a push and a pull factor and supportive of a horizontal motive for FDI. The agglomeration variable is also significantly positive. The coefficient on sector-level skill intensity is negative and significant at the one percent level, indicating that more skilled-labor intensive industries receive less FDI. This is consistent with a vertical motive for FDI and is further supported by the negative coefficient on the capital-labor ratio, also significant at the one percent level. When the parent country is relatively skilled labor abundant, the negative coefficient on skill differences (*pabdiffskill*) suggests that larger differences deter FDI, although the coefficient is not significant at conventional levels. However, the interaction term between skill differences and skill intensity is significantly positive. The total effect of a change in skill differences on FDI inflows is given by

$$\frac{\partial FDI}{\partial pabdiffskill} = -148,692 + 870,186 * skillintensity \tag{5}$$

which is positive when a sector's skill intensity is greater than 0.17. The mean skill intensity in the sample (see Table 4) is 0.29 and only about six percent of sectors have a skill intensity below 0.17. Hence, in all but the most unskilled-labor intensive sectors, greater skill differences raise FDI. Moreover, if the coefficient on skill differences is considered to be zero, the FDI-skill difference correlation is always positive, lending further support to the vertical multinational model.

The total effect of sector-level skill intensity on FDI is given by

$$\frac{\partial FDI}{\partial skillintensity} = -137,462 + 870,186 * pabdiffskill \tag{6}$$

which is negative when *pabdiffskill* is less than 0.158. The mean skill difference being about 0.1, this is true for 23 out of 39 countries that are skilled-labor abundant relative to Mexico

(at least for some years). For these countries, FDI and skill intensity are negatively related, which is consistent with a vertical motive for FDI. However, for highly skilled-labor abundant countries, skill intensity and FDI are seemingly positively correlated. To explore this result further, we split the sample below into moderately and highly skill abundant countries. For the few countries that are skilled-labor scarce relative to Mexico, neither skill differences nor skill intensity are statistically significant.

The results regarding the effect of plant and corporate scale economies are mixed. The number of firms in an industry has a significantly negative effect on FDI. A large number of firms may indicate a lack of economies of scale, but also a relatively competitive industry, driving profits down and thus giving multinationals little incentive to invest.

Out of the investment climate, trade openness and distance variables, only Mexican trade openness is significant and positive. This is inconsistent with a tariff-jumping motive for FDI and thus provides evidence against horizontal multinational activity in Mexico. Parental trade openness has the expected sign, but is not significant.[13]

To sum up, the results so far provide clear evidence of multinational activity in Mexico that is of the vertical type. However, the significant effect of market size suggests the presence of horizontal multinationals as well. Moreover, there are indications that the FDI-skill intensity relationship is non-monotonic and FDI from highly skilled-labor abundant countries flows into, from Mexico's perspective, skilled-labor intensive industries.

Columns 1 and 2 of Table 5 differ only in the proxies used to account for plant and corporate scale economies. Column 2 includes measures of plant and corporate scale economies that

[13] One might be concerned about simultaneity since a considerable share of output of multinational firms is exported. Entering lagged values of the openness variables does not change the results. Using a measure of trade costs from the World Economic Forum, as in Carr et al. (2001), higher trade costs significantly deter FDI, while other results are unchanged. However, this measure does not have sufficient time variation given our sample period.

are similar to Brainard (1997), although we can only calculate the average number of workers per plant given the number of plants and the total number of production and non-production workers, respectively. While the coefficients on both variables have the expected sign, neither is significant. However, none of the other results have changed.

To further investigate the result that skill differences between source countries and Mexico have different effects on FDI depending on the degree of these differences, we split the sample into three parts: moderately skilled-labor abundant source countries (those with skill differences below the threshold level of 0.158 identified above), highly skilled-labor abundant source countries (those above the threshold level) and countries that are skilled-labor scarce relative to Mexico. The results are reported in columns 3-5 of Table 5. Focusing on the skill variables, when skill differences are relatively small, only the coefficient on skill intensity is significant and negative. Since the interaction term is insignificant, FDI from all of these countries flows into relatively unskilled-labor intensive industries. For highly skilled-labor abundant countries, none of the skill variables are significant, suggesting that there is no clear correlation between skill abundance, skill intensity and FDI from these countries. The coefficient on the capital-labor ratio, on the other hand, is significantly negative only in the high-skill group, not the moderate-skill one. Another interesting difference is that FDI appears to flow into smaller firms from the moderately skilled-labor abundant countries (a significantly negative coefficient on $firmsize$) whereas it flows into larger firms from highly skilled-labor abundant countries (a significantly positive coefficient on $firmsize$). [14] We conclude that the ambivalent result with respect to the correlation between FDI and sector-level skilled-labor intensity is driven by those countries that are highly skilled-labor abundant. They appear to invest in labor-intensive industries in general, regardless of skill level.

[14] This result also explains why the coefficient on $firmsize$ is insignificant in the full sample.

The next subsection conducts a battery of robustness checks which focus on some further data and econometric issues.

5.2 Robustness Checks

Since skill endowment differences and skill intensity provide the main results, we first run regressions that use different specifications for those key variables. Specifically, we change the definition of skill abundance and intensity, relate skill intensities more directly to skill endowments and use wages rather than factor endowments.[15] Next, we gauge the robustness of the results by alternatively inserting country and industry fixed effects. Finally, we replace the tobit specification with a least squares one to demonstrate that the main results do not hinge on using a censored regression method, although we do believe that it is the appropriate one.

In column 1 of Table 6 we report results where skill differences are now defined as the ratio of the endowment of skilled to unskilled workers in the source country divided by the ratio of skilled to unskilled workers in Mexico. This definition has two advantages. First, defining skill abundance in this way eliminates the need to enter this variable separately for skilled-labor abundant and skilled-labor scarce countries. Second, taking the ratio of skilled to unskilled workers rather than the share of skilled workers relative to all workers is consistent with the definition of the capital-labor ratio.[16] Sector-level skill intensity is now defined as the ratio of skilled to unskilled workers in each industry as well.

Note first that the magnitude and significance level of all regressors not involving skill abundance or skill intensity are virtually unchanged. The coefficient on skill differences (*diffskillratio*)

[15] Another way to gauge the robustness of the results would be to use different data sources for our skill measures. However, unlike the ILO data used here, these lack sufficient time series variation.

[16] Using the ratio of skilled to unskilled workers rather than the share of skilled workers in the earlier definition of skill differences does not affect the results reported above.

is essentially zero, while the coefficient on skill intensity is significantly positive and the interaction term significantly negative, as before. The zero coefficient on skill differences implies that the partial derivative of FDI with respect to skill differences is positive for any level of skill intensity. Larger skill differences are associated with a greater level of FDI, which again is consistent with a comparative advantage motive of FDI.

The partial derivative of FDI with respect to skill intensity is now given by

$$\frac{\partial FDI}{\partial skillratio} = -76,426 + 27,910 * diffskillratio \tag{7}$$

This derivative is less than zero if skill differences are less than 2.74. The mean skill difference ratio being about 1.93, this is true for 27 countries (at least for some years), including the U.S. This confirms the result that FDI and skill intensity are negatively correlated for moderately, but not highly skilled-labor abundant source countries.

Another way to check whether FDI is positively related to skill differences and flows predominantly into unskilled-labor intensive industries is to relate sector-level skill intensity in Mexico directly to skilled-labor abundance of the parent country. Column 2 of Table 6 contains such a variable. It is the ratio of skill intensity in a particular sector relative to the share of skilled labor in the workforce in the source country of investment. The comparative advantage motive for FDI leads us to expect a negative sign. A more skilled-labor abundant source country (a larger denominator) should have more FDI in Mexico, while more skill intensive sectors in Mexico should receive less FDI. The coefficient on this ratio is negative and highly significant, while the signs and significance levels of all other variables are unchanged compared to the benchmark estimation. Again, this lends support to the vertical model of FDI.

Some researchers have argued that skill endowments are only loosely related to factor cost, which firms take into consideration in making their location decisions (e.g. Braconier et al.

2002). While we have a measure of Mexican wages on a sectoral basis, we do not have the same measure for all source countries. Moreover, while we can distinguish between wages, salaries and benefits, we do not have separate information for blue- and white-collar workers. Thus, we construct a crude measure of relative wages by calculating the average wage for an industry and the overall average Mexican wage and take the ratio. A negative correlation between this relative wage measure and FDI is expected as wages should be lowest in sectors intensive in unskilled labor. Column 3 of Table 6 shows that the coefficient on this wage measure is indeed negative, but barely insignificant at conventional levels, while all other results are again unchanged.

Table 7 presents results from regressions that include country and industry specific fixed effects and from a least squares regression. Qualitatively, results are unchanged. Deviations from the basic results largely follow a predictable pattern. E.g., when country fixed effects are included (column 1), coefficients on variables that vary only across countries and over time are now identified solely from their time variation. Thus, not surprisingly, their magnitude and/or significance level changes. Source country GDP is now no longer significant and the magnitude of the coefficient on skill differences has changed. As a consequence, the positive relationship between skill differences and FDI now obtains only for sectors with a skill intensity slightly greater than the mean skill intensity, rather than close to 94 percent of them. However, the signs and significance levels of other variables are virtually unchanged. Most importantly, the estimated skill difference threshold that separates countries for which there is a negative correlation between a sector's skill intensity and FDI and countries for which the correlation is positive is unchanged at about 0.15.

Similarly, when industry fixed effects are included (column 2), the skill intensity variable now becomes insignificant since it varies little over time. Note also that the sector-specific variables

that are only available for one year have to be excluded in this specification. Nevertheless, the estimated skill intensity threshold above which there is a positive relationship between skill differences and FDI is very similar to the basic specification. Finally, running least squares rather than tobit (column 3) also leaves the major qualitative conclusions unaltered, although the magnitude of the coefficients does change and e.g. Mexican GDP now becomes insignificant. The bottom line is that our results do not hinge on the chosen econometric method and are as insensitive as can be expected to the inclusion of country and industry fixed effects.[17]

6 Conclusion

Attracting more foreign investment, especially in the form of FDI, has been a policy objective for many developing countries recently, reversing many years of severely regulated or even hostile treatment of foreign investors. The benefits from foreign investment, which accrue in the form of increased employment, forward and backward linkages and technological spillovers, crucially depend on the type of multinational activity that is attracted. Horizontal multinationals are more likely to provide these benefits than vertical multinationals, yet there is a presumption that the main motive for investing in relatively capital- and skilled-labor scarce countries is to take advantage of lower labor costs, which implies a vertical motive.

The existing empirical literature on the type of multinational that is dominant in the data thus far has tended to overwhelmingly favor the horizontal over the vertical model. Given that most of the data used comes from U.S. or other developed country sources, this finding is not overly surprising. By using industry-level data from a developing host country, this paper has attempted to shed light on the determinants and types of multinational activity from a rather

[17] We tried a number of other variations, e.g. including a U.S. dummy since, as can be seen from Table 3, over 60 percent of FDI flows originate there. All results hold up. These are available upon request.

different perspective.

The results are mixed, although largely supportive of the vertical model despite choosing a host country that is not extremely skilled-labor and capital scarce and where anecdotal evidence has indicated that in recent years capital- and skilled-labor intensive production has located. We find limited support for this in the data. Skill endowment differences are positively correlated with FDI. Interestingly, when skill differences are moderate, skill intensity and FDI are negatively correlated, as would be expected, but when skill differences are very large, FDI flows into labor-intensive industries, regardless of skill level. A possible explanation is that given the very different range of goods produced by Mexico and an extremely skilled-labor abundant source country, these activities are unskilled-labor intensive from the latter's perspective.

This paper has contributed to the literature on which type of multinational dominates the data as well as to the literature on the determinants of FDI in developing countries. It is our hope that in the future, more such detailed and high-quality data as was used in this study will become available so that these questions can be examined at a disaggregated level for other countries or even for a panel of developing host countries. It would also significantly advance the debate on how likely developing countries' policies of trying to attract foreign investors are to contribute to the process of growth and development.

Data Appendix

Real FDI are FDI inflows in thousands of 1995 U.S. dollars, by 4-digit industry (Mexican classification system CMAP), from the Mexican Ministry of Trade and Industrial Development (SECOFI). Sector-specific producer price indexes from the U.S. Bureau of Labor Statistics (BLS) are used as deflators. Since the industry classification used by the BLS differs from CMAP, we use industry concordances put together by Jon Haveman[18] and information collected from Cremeans (1999). No sector-level deflators are available for Mexico.

GDP and MexGDP are source country and Mexican gross domestic product in billions of 1995 U.S. dollars, respectively. GDP and exchange rate information are from *International Financial Statistics*.

FDIaglom are cumulative real FDI flows by industry.

diffskill is the difference between the ratio of skilled labor to total labor force in the source country and Mexico; skilled labor is measured as professional, technical and associated professionals, other professionals and managerial workers. This information is taken from the 2001 issue of the International Labor Organization's Yearbook of Labor Statistics. A *pab* prefix indicates that the parent country is skilled-labor abundant; a *mab* prefix indicates Mexico is skilled-labor abundant.

diffskillratio is the ratio of skilled to unskilled workers in the source country relative to Mexico.

skillintensity is the ratio of white collar to the sum of white collar and blue collar workers ("obreros" and "empleados"), by industry, from SECOFI.

skillratio is the ratio of white collar to blue collar workers, by industry.

skillabundance is the ratio of skilled labor to total labor force in the source country.

[18] They can be found on the web at http://www.macalester.edu/research/economics/PAGE/HAVEMAN/Trade.Resources/TradeConcordances.html

relative wage is the average hourly wage in an industry relative to the average manufacturing wage in Mexico.

klratio is the ratio of net fixed assets (in thousands of 1995 U.S. dollars) per employed person, from the Mexican Industrial Census of 1999, referring to 1998.

numfirms is the actual number of firms in that industry, from the 1999 Census.

industrysize is total gross production, in thousands of 1995 U.S. dollars.

firmsize is *industrysize* divided by *numfirms*.

pscale is the average number of blue collar workers in a plant, by industry, from SECOFI.

cscale is the average number of white collar workers in a plant, by industry, from SECOFI.

invcostmex is an index of overall economic freedom, ranging from 0 to 100, from the Heritage Foundation, for Mexico.

openmex is the ratio of exports plus imports to GDP (in percent), taken from the World Bank's World Development Indicators (WDI).

openpar is the ratio of exports plus imports to GDP (in percent) for FDI source countries, also from WDI.

distance is the distance in kilometers from Mexico City to an FDI source country's capital.

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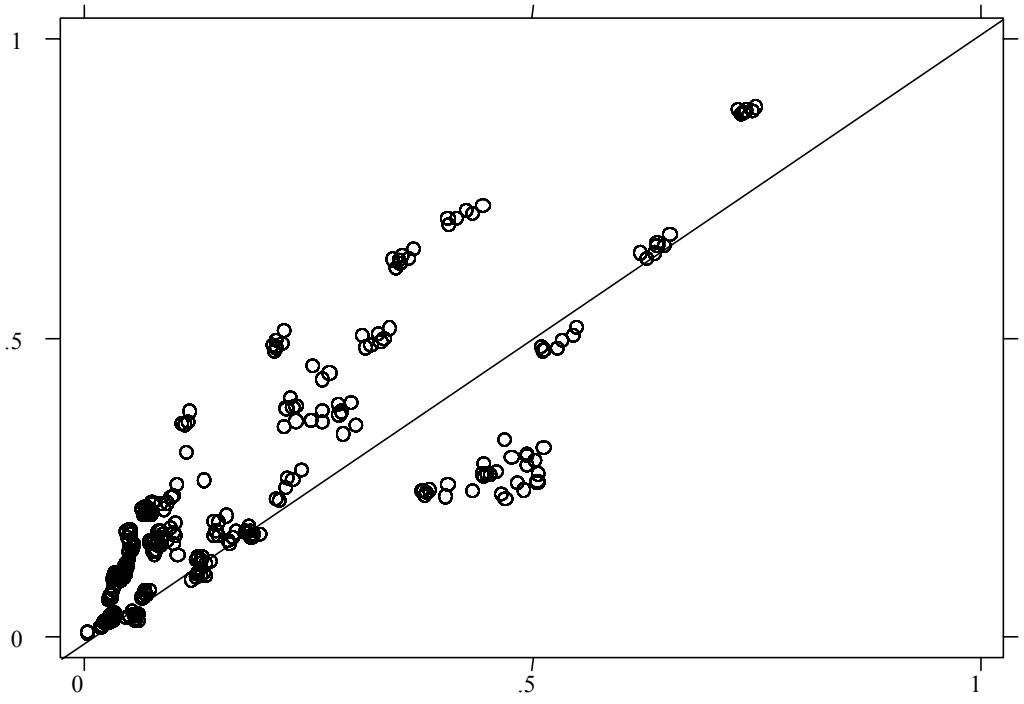
Figure 1: FDI observations in an Edgeworth Box



Notes: Each circle represents one Mexico-source country-year FDI observation. Source country skilled-labor share is on the vertical axis, source country unskilled-labor share is on the horizontal axis. The source country is relatively skilled-labor abundant when observations are located above the diagonal.

Table 1a: FDI Inflows (Millions of US$)

	1994	1995	1996	1997	1998	1999	2000	Total
Agriculture	8.1	8.9	31.2	10.3	28.2	76.8	81.4	245.0
Mining	88.5	77.9	72.2	106.0	40.3	121.5	161.2	667.6
Manufacturing	5,667	4,687	4,642	7,220	4,800	8,600	7,543	43,160
Utilities	15.2	2.1	1.1	5.2	26.6	139.5	51.9	241.6
Construction	244.0	21.6	22.2	101.7	64.5	106.5	40.8	601.2
Commerce	1,395	952.0	644.2	1,842	855.0	924.9	1,690	8,303
Transp./Comm.	719.3	876.3	425.8	291.1	325.1	153.2	-2,589	201.9
Banking	896.5	1,063	1,207	999.6	632.6	674.7	4,327	9,800
Other Services	907.1	364.2	448.1	709.3	698.5	1,007	981.4	5,115
Total	9,941	8,053	7,493	11,286	7,471	11,804	12,287	68,335

Source: SECOFI

Table 1b: FDI Inflow Shares (in percent)

	1994	1995	1996	1997	1998	1999	2000	Average
Agriculture	0.1	0.1	0.4	0.1	0.4	0.7	0.7	0.4
Mining	0.9	1.0	1.0	0.9	0.5	1.0	1.3	1.0
Manufacturing	57.0	58.2	61.9	64.0	64.3	72.9	61.4	63.2
Utilities	0.2	0.0	0.0	0.0	0.4	1.2	0.4	0.4
Construction	2.5	0.3	0.3	0.9	0.9	0.9	0.3	0.9
Commerce	14.0	11.8	8.6	16.3	11.4	7.8	13.8	12.2
Transp./Comm.	7.2	10.9	5.7	2.6	4.4	1.3	-21.1	0.3
Banking	9.0	13.2	16.1	8.9	8.5	5.7	35.2	14.3
Other Services	9.1	4.5	6.0	6.3	9.3	8.5	8.0	7.5
Total	14.5	11.8	11.0	16.5	10.9	17.3	18.0	100

Source: SECOFI

Table 2: FDI Inflow Shares, Manufacturing Subsectors (in percent)

	1994	1995	1996	1997	1998	1999	2000	Average
Food/Beverages	18.1	8.7	2.4	33.7	13.2	9.1	9.0	14.1
Textiles/Apparel	0.1	0.1	0.2	0.1	2.0	0.4	0.2	0.4
Wood Products	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.1
Paper/Printing	0.1	0.4	0.1	0.1	0.7	0.6	1.8	0.6
Chemical	6.4	8.2	21.1	7.5	19.5	10.6	11.8	11.6
Clay,Glass,Cement	0.0	1.2	0.6	0.0	0.0	2.1	1.7	0.9
Iron and Steel	21.2	1.8	6.4	1.4	0.3	2.7	1.5	4.7
Metal, incl. Autos	29.2	54.1	41.8	33.7	40.7	54.2	40.7	42.3
Miscellaneous	24.9	24.9	27.4	23.5	23.7	20.3	33.3	25.3

Source: SECOFI

Table 3: FDI Source Country Shares (in percent)

	1994	1995	1996	1997	1998	1999	2000	Average
U.S.	49.2	66.7	68.9	64.2	67.4	56.2	80.2	64.7
Canada	7.4	2.1	6.9	2.0	2.4	5.1	4.9	4.4
EU	19.4	22.6	14.8	27.4	25.9	25.8	9.2	20.6
Non-EU Europe	0.5	2.5	1.1	0.3	0.3	0.9	0.9	0.9
Asia	18.8	4.2	7.8	5.4	3.1	11.6	4.4	8.1
Latin America	3.6	1.2	0.4	0.7	0.6	0.3	0.3	1.0
OECD	83.2	97.2	94.7	98.7	98.0	98.8	98.6	95.7
Developing	15.7	1.5	4.5	0.6	0.4	0.0	0.3	3.2

Source: SECOFI

Table 4: Summary Statistics

Variable	Mean	Standard Deviation	Minimum	Maximum
Real FDI	1525.8	22,541	-355,271	870,290
GDP	548.5	1,448.1	3.80	9,048.8
$MexGDP$	322.9	27.5	286.6	375.2
$FDIaglom$	278,293	671,833	-9,994.4	5,588,123
pabdiffskill	0.10	0.09	0	0.30
mapdiffskill	0.01	0.02	0	0.10
diffskillratio	1.93	1.09	0.34	4.61
skillintensity	0.29	0.11	0.11	0.63
skillratio	0.45	0.28	0.13	1.69
skillintensity/skillabundance	1.57	1.19	0.24	10.51
relative wage	0.96	0.38	0.31	2.30
$numfirms$	5,537.0	8,296.8	27	38,029
$firmsize$	9,927.2	20,090	25.9	94,327
industrysize	5,329,562	6,172,446	165,647	4.14e07
pscale	32.2	74.3	0.19	493.8
cscale	13.2	24.5	0.03	133.2
klratio	45.0	57.8	3.7	318.2
invcostmex	62.0	3.08	57	66
openmex	58.7	8.52	38.5	65.3
openpar	79.8	55.0	16.4	339.1
distance	8,864	4,019	1236	16,641

For variable definitions and units of measurement, see the Data Appendix.

Table 5: Weighted Tobit Estimates

Regressors	Dependent Variable: Real FDI flows				
	(1)	(2)	(3)	(4)	(5)
	Full sample	Full sample	Moderately skill abundant	Highly skill abundant	Skilled labor scarce
GDP	6.147***	6.278***	4.661***	8.512**	5.860
	(1.707)	(1.718)	(1.242)	(3.823)	(8.779)
MexGDP	195.6**	185.7**	93.82***	212.3*	13.08
	(95.64)	(83.27)	(25.97)	(128.3)	(10.61)
FDIaglom	0.007**	0.009***	0.001	0.023***	-0.001
	(0.003)	(0.003)	(0.001)	(0.006)	(0.001)
pabdiffskill	-148,692	-134,931	85,662	268,317	
	(92,964)	(89,072)	(76,603)	(321,741)	
mabdiffskill	-165,729	-190,398			-50,492
	(344,684)	(341,873)			(99,829)
skillintensity	-137,462***	-144,121***	-32,095**	-102,899	8,432
	(38,590)	(49,120)	(15,973)	(192,979)	(9,852)
*pabdiffskill**	870,186***	824,774***	158,627	626,907	
skillintensity	(301,088)	(268,250)	(176,437)	(902,284)	
*mabdiffskill**	-590,231	-506,117			-353,235**
skillintensity	(918,500)	(853,577)			(163,482)
numfirms	-0.962**		-0.144	-1.937**	-0.217**
	(0.390)		(0.104)	(0.984)	(0.111)
firmsize	0.094		-0.178*	0.592**	-0.227
	(0.208)		(0.097)	(0.288)	(0.139)
pscale		-59.40			
		(115.4)			
cscale		444.0			
		(466.0)			
klratio	-375.7***	-387.8***	-29.00	-673.5***	-169.6**
	(126.4)	(120.8)	(25.20)	(210.8)	(70.11)
invcostmex	958.7	932.2	94.93	1,721	145.2
	(758.5)	(680.8)	(145.2)	(1,301)	(145.9)
openmex	496.6***	498.24***	88.64	464.4	190.6**
	(97.40)	(100.8)	(76.93)	(332.9)	(83.30)
openpar	47.88	51.12	-69.67**	45.63	-34.03
	(73.33)	(77.21)	(31.95)	(142.8)	(32.92)
distance	-1.097	-1.034	-2.045***	-1.071	0.170
	(0.906)	(0.937)	(0.559)	(3.906)	(0.425)
Log likelihood	-17,956	-17,973	-5,968	-8,974	-2,277
χ^2	147.98	160.21	80.01	91.36	125.65
Probability $> \chi^2$	0.00	0.00	0.00	0.00	0.00
Observations	14,736	14,736	5,904	5,280	3,552

Notes: Robust standard errors in parentheses, adjusted for clustering on industry.
***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

Table 6: Data Robustness Checks

Regressors	Dependent Variable: Real FDI flows		
	(1)	(2)	(3)
GDP	6.134***	6.187***	7.851***
	(1.727)	(1.767)	(1.968)
MexGDP	207.3**	171.7**	232.7***
	(98.23)	(84.70)	(88.57)
FDIaglom	0.007**	0.009***	0.003
	(0.003)	(0.003)	(0.003)
diffskillratio	-422.5		
	(5,260)		
skillratio	-76,426***		
	(23,701)		
*diffskillratio**	27,910***		
skillratio	(9,961)		
skillintensity/		-14,967***	
skillabundance		(3,932)	
relative wage			-8,472
			(5,319)
numfirms	-0.952**	-1.008**	-0.932***
	(0.389)	(0.411)	(0.271)
firmsize	0.101	0.113	0.164
	(0.209)	(0.210)	(0.193)
klratio	-377.0***	-368.4***	-345.0***
	(125.3)	(125.0)	(109.6)
invcostmex	1,051	773.1	970.2
	(781.4)	(709.2)	(693.2)
openmex	479.8***	510.2***	478.6***
	(99.77)	(96.84)	(137.0)
openpar	32.98	60.11	84.02
	(74.28)	(71.26)	(82.05)
distance	-1.206	-0.930	-0.601
	(0.889)	(0.854)	(0.619)
Log likelihood	-17,966	-17,989	-21,675
χ^2	95.84	143.12	136.89
Probability $> \chi^2$	0.00	0.00	0.00
Observations	14,736	14,736	19,488

Notes: Robust standard errors in parentheses, adjusted for clustering on industry.
***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

Table 7: Econometric Robustness Checks

	Dependent Variable: Real FDI flows			
Regressors	(1) Country fixed effects	(2) Industry fixed effects		(3) Least Squares Regression
GDP	-2.729	6.036***		0.854**
	(8.535)	(0.967)		(0.410)
MexGDP	187.3*	185.9*		-1.522
	(107.5)	(98.7)		(2.945)
FDIaglom	0.011***	0.012***		0.005***
	(0.002)	(0.004)		(0.0003)
pabdiffskill	-242,560**	-159,733***		-11,085**
	(113,354)	(53,985)		(5,029)
mabdiffskill	-553,941	-147,310		8,332
	(610,319)	(162,101)		(6,474)
skillintensity	-119,005***	-34,080		-5,340**
	(30,342)	(90,070)		(2,486)
*pabdiffskill**	791,007***	875,357***		64,195**
skillintensity	(248,675)	(247,280)		(25,584)
*mabdiffskill**	-341,194	-597,039		6,753
skillintensity	(521,343)	(432,503)		(19,090)
numfirms	-0.804***			-0.006
	(0.233)			(0.005)
firmsize	0.098			0.015**
	(0.111)			(0.006)
klratio	-354.1***			-8.252*
	(88.16)			(4.448)
invcostmex	956.4	1,078		45.65
	(1,022)	(975.8)		(55.51)
openmex	630.0**	376.3		-17.30
	(281.6)	(240.3)		(16.60)
openpar	-158.9	46.40**		1.721
	(205.1)	(21.67)		(1.597)
distance		-1.203***		-0.084**
		(0.297)		(0.038)
Log likelihood	-17,680	-17,698	R^2	0.0293
χ^2	374.90	277.84	F-test	102.50
Probability $> \chi^2$	0.00	0.00	P $> F$	0.00
Observations	14,736	14,736		14,736

Notes: Robust standard errors in parentheses, adjusted for clustering on industry.
***, **, * denote significance at the 1%, 5%, and 10% level, respectively.

Table A1: FDI source countries included in full sample

United States	Austria	Bolivia	Egypt
Canada	Belgium	Chile	Israel
Australia	Denmark	Colombia	Hongkong
New Zealand	Finland	Costa Rica	Japan
	Germany	Ecuador	Malaysia
	Greece	El Salvador	Pakistan
	Ireland	Honduras	Philippines
	Italy	Panama	Singapore
	Netherlands	Paraguay	South Korea
	Portugal	Peru	Thailand
	Spain	Uruguay	
	Sweden	Venezuela	
	United Kingdom		
	Iceland		
	Norway		
	Switzerland		
	Turkey		
	Czech Republic		
	Hungary		
	Poland		
	Romania		
	Slovac Republic		