Foreign Direct Investment Flows: An Examination of Its Distribution Among Middle- and Low-Income Countries

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The potential effects foreign direct investment (FDI) has on growth and employment have led many developing countries to compete for FDI. In a period of rapid globalization the competition for FDI inflows has become intense. We examine factors that affect the distribution of relative shares of FDI flows among low- and middle-income developing countries using panel data. We use a simultaneous equations model to account for the bidirectional determination between the FDI stock and FDI flow. Estimation results demonstrate that countries with higher GDP growth rates, lower tax rates, smaller cost of business start-up, less corruption and higher secondary school enrollment are more successful in attracting FDI.

INTRODUCTION

In the last 20 years the world economy has witnessed a tremendous increase in the importance of Foreign Direct Investment (FDI) as a source of economic development. FDI has become particularly important in financing investment and growth for developing countries. The status and importance of FDI as a vehicle of economic development has become even more obvious in recent years. Many scholars have concluded that FDI has positive effects on the balance of payments, promotes exports, creates employment and radiates an array of externalities – financial, technological, institutional, and managerial, into the host countries.

The recipient or host countries have preferred FDI to other forms of capital inflows because in addition to being a major source of financing (critical for countries suffering from chronic financial market failures), it stimulates the formation of human capital, promotes successful corporate governance practices, and is often accompanied by technological and institutional transfers. FDI is also more stable than other forms of investment. Once made, FDI tends to be harder to move out of a country, compared to other forms of foreign investment such as portfolio investments. Some studies go even further and point at FDI as a source of economic and political stability for the regions that receive it and for host countries.

Given its growing importance, a large pool of countries has entered into keen competition to attract FDI. Nevertheless, the data on FDI location describes a very uneven distribution of FDI. The lion's share

(75%) goes to the developed world - the group of countries where people make on the average more than $20,000 a year. Out of the remaining 25%, 66% (or another 16.5% of the total) is absorbed by the group of the twelve largest developing economies (with China and India leading the "emerging" group of countries).

In spite of being one of the most researched topics in international economics, FDI continues to receive a large amount of research attention. There are still contradicting opinions on what are the ingredients for a successful recipe to attract FDI. A large segment of theoretical literature on FDI location is based on the conventional model of comparative advantage derived from cross-country differences in factor endowments. According to this framework, we should see (FDI) flowing mainly to capital-scarce, poor countries. In reality, the least developed countries received a negligible share of the total world FDI during the 1990s. For example, in 1994, the least developed countries that accounted for more than 4% of world production and 11% of world population received less than 1% of total world FDI (Zhang and Markusen, 1999). We show later on that a similar pattern of uneven FDI distribution prevailed during the 2000s with countries at the bottom of the wealth hierarchy receiving a very small fraction of the world's total FDI.

Logically, some questions arise for both the multinational enterprises (MNEs) seeking to place their investment in the most advantageous locations and for those countries entering the competition to attract more FDI. For MNEs the relevant questions pertain to what makes a successful location choice for their investment. For potential recipient countries the questions pertain to how MNEs decide to locate their investments. In short, what are the most important determinants of FDI location?

REVIEW OF THE LITERATURE

On the question of the location determinants of FDI, Chakrabarti (2001) found that market size (as a proxy for market potential) and market openness are positively associated with the volume of FDI inflows. Asiedu (2002) showed that among the more important factors in attracting large amounts of FDI are the country's openness to trade, its infrastructure availability, and the potential return to capital. She did not find conclusive evidence, in the case of the African economies in her study, that economic and political variables such as growth rates, government consumption, inflation rate, money growth, and political risk are significant factors. In particular, she investigated Africa's poor performance in attracting FDI in the late 1990s. For example, sub-Saharan Africa's share of the world's FDI had fallen steadily to just below 3% in 1995-99. When using a dummy variable for "Africa" in a cross-country model that included several locational choice variables, the "dummy" coefficient turned out to be significantly negative. She concluded that the African continent has a negative image in the investors' view. This is different from earlier decades. For example, Agodo (1978) found that US FDI in Africa was determined by market size (market-seeking behavior), the presence of raw materials (resource-seeking behavior), and a sufficiently developed infrastructure along with political stability. In that earlier study, tax concessions and tariff protection did not have a significant influence on foreign investment decisions.

Firms also tend to be sensitive to the existing infrastructure of potential FDI locations. The relevant measures of infrastructure sophistication may vary by firm and its needs. The transportation network has been a key measure of infrastructure sophistication particularly where global supply management plays a key role in the ability of firms to compete. Communication infrastructure, measured in the past as telephone lines, has also been used in studies of FDI. More recently, relevant proxies for infrastructure have included network readiness, which has attracted more attention from MNEs as they rely more and more on the internet for vital communications and other functions.

In other studies of FDI, Gastanaga et al. (1998) found that the expected rate of growth was a highly significant determinant of FDI while exchange rate volatility did not play an important role. As may be expected, high levels of corruption in the host country can repel FDI while high corporate tax rates can play a negative role in attracting FDI, especially corporate tax rates of 25% or higher. Along the same line of research, attracting FDI has been found to be more likely with the combined presence of an open

economy, smaller government, political stability, market competition, and a higher rate of saving and investment in the host economy.

From a different perspective, one can analyze the FDI location factors and how a country is affected by FDI. One may argue that the extent and direction in which FDI benefits the host country influences - endogenously – most of the variables that, in turn, would attract FDI into that country. This argument is one of the bases for our analysis that there has been growing competition among developing countries for attracting FDI.

The literature on how FDI can benefit the recipient economies is varied in its conclusions. De Mello (1999) argued that the benefits of FDI depend on spillovers, profitability, value-added content of FDI related production, capital formation, employment, exports, and technology in the recipient economy. Further, he showed that the rate of FDI growth alone would not be sufficient to account for a country's economic growth. Grossman and Helpman (1991) pointed out that FDI in developing countries may specialize in producing less technology-intensive goods or simply engage in exploiting their natural resource. In both cases spillover effects and learning by doing opportunities are very limited. A slightly different opinion is provided by Borensztein et al. (1998). They argued that FDI is an important determinant for technology transfers and contributes more to growth than domestic investment. They analyzed a group of 69 developing countries over a period of 20 years and concluded that FDI has strong positive impacts on economic growth. However, they argue that the strength of this impact depends on human capital - countries with low levels of human capital hardly benefit from FDI. It may be concluded that human capital is the major ingredient that enables recipient countries to benefit from FDI and from the externalities created by FDI. In addition, Alfaro (2010) found that capturing FDI's beneficial effects depends on the financial sophistication of a country. In other words, countries lacking modern financial infrastructures are unlikely to reap the benefits of FDI because it is access to finance that allows domestic entrepreneurs to take advantage of backward and forward linkages created by FDI.

In looking at locational factors determining FDI flows, we can begin by looking at what distinguishes MNEs from domestic firms. Markusen (1995) enumerated four factors that tend to distinguish between MNEs and local firms: MNEs tend to have higher levels of R&D; have greater need for human capital; are more likely to introduce new and complex products; and are more likely to engage in advertising and product differentiation. Thus, when MNEs are searching for the best destinations for their capital, the availability of human capital is among the highest ranked location variables. A more recent trend in FDI location shows that MNEs invest in skilled-labor countries to outsource white-collar workers. Non-tradable sectors such as bank, insurance, credit-card, accounting, investment banking, and high-tech engineering, companies extend their activities in skilled-labor-abundant developing countries. MNEs have direct requirements such as engineers, technicians, and accountants and indirect requirements such as electrical and water supplies, telecommunications, transport links, and legal institutions. The availability of these elements helps determine FDI location. They indicate the presence of the intangible and firm-specific assets which form the foundation of knowledge capital that is associated with much of modern FDI.

Deichmann et al. (2003) considered the role of social and human capital in determining the flow of FDI into Eurasian countries. They found that the volume of FDI that flows into a country, relative to the country's population, depends heavily on social capital - measured by the infrastructure level; and human capital - measured by the level of professional skills. They also found the depth of financial markets - another dimension of social capital - to be an important determinant of FDI.

In further examining the FDI decisions by individual firms, we should differentiate among different reasons for FDI location. Much of early FDI was in extractive industries and such FDI continues to be significant particularly in emerging economies. Efficiency-seeking is another strong motivation for FDI and explains a significant portion of FDI that took place in many emerging economies such as China and Mexico. Market expansion (market-seeking behavior), is a third explanation for FDI. MNEs seeking growth opportunities look to countries with large market potential for their products and services. As average incomes rise in emerging markets - a tendency that seems irreversible - they become increasingly attractive for market seeking MNEs. In addition, a MNE's ability and willingness to differentiate its

products explain their continuous international expansion, an interpretation of MNE behavior consistent with Hymer's early explanation of MNE behavior (Hymer, 1976).

Firms can also base their FDI decisions on the presence of other MNEs in a particular market. This is known as the agglomeration effect. Such agglomeration effects can explain why FDI tends to cluster in certain countries. Firms may be motivated by the already existing market provided by other upstream MNEs with whom they have had relationships in the past particularly in their home country. The presence of other MNEs can also provide signals to potential entrants regarding the desirability of FDI in a particular location. According to the Capital Markets Consultative Group's survey of large corporate investors (IMF, 2003) because of significant vertical linkages in production networks, some types of FDI flowing into emerging market economies (EMCs) are motivated by following existing clients into a new market. This generates agglomeration effects and creates FDI clusters. A large majority of the survey's respondents emphasized also that they invest in EMCs primarily to meet domestic demand rather than to reduce global manufacturing costs.

Evidence of the agglomeration effect is provided in a study by Barrell and Pain (1999). They focus on the flow of US FDI into the European Union and discovered that, even with few barriers to trade, FDI still tend to agglomerate for a number of reasons. By locating FDI near other foreign firms, investors can realize beneficial spillover effects including R&D related advantages and linkages to intermediate goods. Shaver (1997) found that there are country-specific and industry-specific information spillover effects for corporations when they consider FDI. Furthermore, FDI tends to be a sequential process whereby a firm's prior country-specific knowledge positively influences the FDI decision and that furthermore, industry-specific knowledge gleaned from the experiences of other MNEs also influences the decision to invest positively. Lall and Streeten (1977) suggest that this "herd mentality" is even more relevant in relation to host countries where investor risk is high and information is deficient. Similarly, Kindleberger's (1969) oligopolistic reaction theory suggests that following the leader strategies prevail in making FDI decisions.

More evidence on agglomeration as a factor in FDI location decisions is provided by Chang and Park (2005). In their study of Korean firms locating in China, network externalities were deemed important and that such network externalities were sensitive to the sameness of nationality of the origin of FDI and the similarity of industries. This gives us more reason to account for previous FDI in a country as a factor explaining current and future FDI.

According to early work on MNEs by Hymer (1976) and Kindleberger (1969), the advantages of setting up FDI must exceed the disadvantages of operating outside the home environment in order for the FDI to take place. The MNE must have location-specific advantages based on markets, resource availability, labor and infrastructure. Furthermore Dunning (1993) pointed out that the importance of each location-specific factor varies according to a firm's own inclination toward natural resources, markets, efficiency, strategic assets and other considerations.

We also cannot discount the importance of cultural connections and political factors in the FDI decision. Bandelj (2002) reported that country dyads, political, migration and cultural relations had a strong positive effect on FDI flows. In an earlier study of US FDI in Latin America, Nigh (1986) found that the political environment also influences firm decisions on FDI – a country's hostility to US foreign policy is interpreted at the firm level as hostility to US firms thereby affecting the FDI decision. Henisz and Macher (2004) studied the FDI location decisions of semi-conductor firms between 1994 and 2002. Not surprisingly, they found that such companies looked for countries that had high levels of sophistication – indicating the need to complement the production and design needs of the firm. They also found that companies tended to stay away from politically unstable or hazardous countries where the prospects of expropriation were greater. In addition, they found that companies with less advanced technologies were less sensitive to political hazard when making FDI decisions. However, we note that it has not always been assumed that political instability was very important in determining FDI decisions by firms. For example, in a 1972 study of FDI decisions in Latin America made by multinational corporations, Bennett and Green (1972) found that political instability was not very important in deterring FDI.

Cultural and historical factors may be an even more important location factor for developing countries. In their study of the FDI location decisions of MNEs from Spain, Galan et al. (2007) found that when investing in less developed countries in Latin America, historical and cultural factors played a more important role than in the developed countries of the European Union. However, Mitra and Golder (2002) found that the cultural gap between the domestic and foreign markets is not significant in explaining foreign market entry. We may then posit that where markets and institutions are already developed, home and host country historical ties become less important in the FDI decision. As such the firm can focus more on strategic asset-seeking behavior. This may also imply that historical and cultural ties compensate for weaker institutional development.

The level of corruption is another factor that may influence FDI decisions of MNEs. Habib and Zurawicki (2002) found evidence that MNEs prefer not to tolerate corruption and provided examples of firms that have successfully instituted zero tolerance for corruption in their FDI. Just as importantly, they found that cultural differences (with respect to the level of corruption tolerated within a country) also influence firm decisions about FDI. Firms from cultures where corruption is less pervasive are less likely to invest in countries where corruption is more pervasive, a finding reinforced by Cuervo-Cazzura (2006).

In a world where the developed countries remain the major attraction for FDI, globalization has given developing countries (DCs) more access to the international capital markets. According to the World Bank's 2009 World Development Indicators, private capital flows into developing countries increased from $208 billion, in 2003, to $961 billion, in 2007. The main source of these flows has been FDI. Approximately 55% of the total private capital flows into developing countries in 2007, was FDI. This has been especially helpful for low income countries for which the net inflows of FDI as a percentage of GDP increased from 1.7% in 2000 to 4.2% (2009 World Development Indicators, WB). For some small countries, FDI inflows can be equivalent to as much as 20% of their GDP.

It is not surprising then that countries would establish more Investment Promotion Agencies (IPAs). Harding and Javorcik (2007) reported that by 2005, 68 out of 81 developing countries had investment promotion agencies. Overall more than 160 countries already had IPAs at the national level and that there were 250 sub-national IPAs. The survey of works done by Lim (2008) on the effectiveness of such investment promotion activities reveals that such activities are not misplaced; investment promotion activities are positively linked to increases in FDI.

The widespread belief among DCs that FDI is an important way of accelerating economic growth has led to increasing competition to attract FDI. On the grounds that becoming "business friendly" leads to greater FDI, many DCs have tried to change their business climate. In one measure from the Doing Business studies of the World Bank, we found that in a sample of 111 DCs, the cost of starting a business (measured as a percent of per capita income) declined by an average of 53% between 2004 and 2010. In fact, in only four countries did the relative cost of starting a business increase.

In this paper, we seek to examine the factors associated with success in attracting FDI inflows from 2000 to 2009. We used panel data of 75 out of 151 countries designated by the World Bank as low- or middle-income countries as of 2000. Many countries were excluded due to serious data shortage. The rest of the paper is organized as follows: data description and summary statistics of the FDI inflow; a discussion of the empirical models used and the implications of our findings; and concluding remarks and directions for future research.

DATA AND SUMMARY STATISTICS

To study the distribution of FDI, we first took the total FDI inflows in our set of 75 low- or middle-income countries. Appendix 1 lists the sample countries by income group. We then calculated the percentage share of each country in this total or "global" FDI inflow. We calculated the similar percentage share of each country in the "global" GDP of this set of countries. This was done for each year from 2000 to 2009. As merely a starting point for comparisons, we posit that absent any differentiation among countries with regard to each one's attractiveness for FDI, each country's share of FDI would be proportional to its size relative to others. Hence a country's share of "global" FDI would reflect its share of

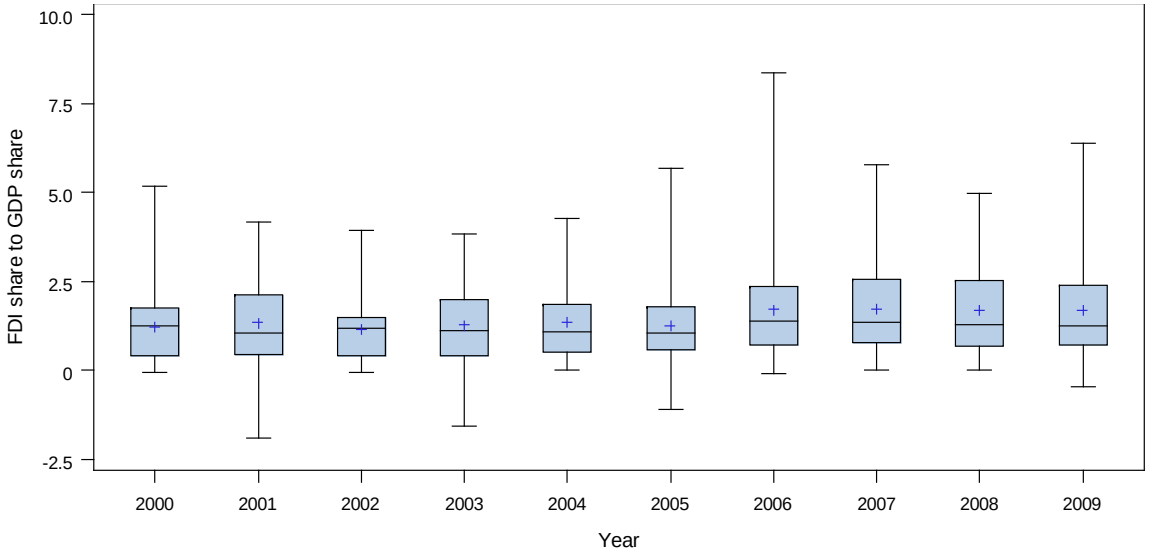
the "global" GDP. We will show momentarily that FDI is in fact not distributed proportionately to GDP and it is the deviations from the proportional distribution of FDI that we seek to examine.

For each country, by taking the ratio of its percentage share of "global" FDI to its percentage share of "global" GDP, we can illustrate the proportionality of FDI inflows. A ratio of 1 would indicate that a country's FDI inflow for the year is proportional to the size of its economy, relative to this set of countries. A ratio greater than 1 would indicate FDI inflow is relatively greater than would be suggested by the size of its economy. As expected, Table 1 shows that FDI inflows are far from proportional to an economy's size. Some countries received negligible FDI inflows, as shown by the minimum values for the different years while others received FDI as much as 8 times of the proportionate size of their economy. The distribution of this share ratio skews slightly to the right (skewness >0) and is less peaked than a normal distribution. Right skewness indicates more countries in our sample have FDI share to GDP share closer to the minimum than the maximum. The box plot displayed in Figure 1 presents a visual summary of our panel data. Each of the box-and-whiskers plots describes succinctly the distribution of the FDI flow for a particular year, and the series of boxes in chronological order reveals the change in distribution over time. Specifically, the mean and median are quite persistent while the distribution varies over time. It is clear that with regard to attracting FDI inflows, the countries differ significantly. We seek to identify the factors that dictate the distribution in a given year as well as its time variations.

TABLE 1
DESCRIPTIVE STATISTICS FOR SHARE OF FDI TO SHARE OF GDP, 2000-2009

Year	Obs.	Mean	Std.Dev	Min	Max	Skewness	Kurtosis
2000	75	1.22	0.95	-0.04	5.17	1.25	2.85
2001	75	1.34	1.15	-1.88	4.15	0.43	0.27
2002	75	1.15	0.86	-0.04	3.94	0.99	0.90
2003	75	1.28	1.06	-1.55	3.84	0.43	0.15
2004	75	1.36	1.01	0.00	4.27	0.96	0.29
2005	75	1.26	1.07	-1.08	5.67	1.17	3.25
2006	75	1.71	1.47	-0.10	8.35	2.01	5.61
2007	75	1.74	1.26	0.02	5.78	1.08	0.83
2008	75	1.69	1.23	0.00	4.98	0.75	0.33
2009	75	1.70	1.38	-0.45	6.36	1.17	1.16
2000-2009		1.44	1.15	-0.51	5.25	1.02	1.50

FIGURE 1
BOX PLOT FOR SHARE OF FDI TO SHARE OF GDP, 2000-2009



Note that the length of the box represents the interquartile range (the distance between the 25th and 75th percentiles). The symbol in the box interior represents the group mean. The horizontal line in the box interior represents the group median. The vertical lines issuing from the box extend to the group minimum and maximum values.

EMPIRICAL METHODS AND RESULTS

In our continuing study of FDI among low- and middle-income countries, we will test for the significance of several factors in explaining for the differences in FDI inflows. Among the factors we will be looking at are: agglomeration, market size, infrastructure, business environment, corruption, human capital, and trade orientation.

If agglomeration among MNEs is indeed important, then we would expect that future FDI inflows would be positively related to existing FDI stock. The likelihood that a company would invest in a foreign country would be greater if it were inclined to follow other companies already in that country. Existing FDI stock per capita is one such measure of the presence of foreign companies in a country

If market seeking and market expansion are powerful motivators for MNE behavior, then market size would be one consideration for FDI decisions. Markets have different dimensions but the measurement should include sheer size (population) and effective purchasing power (income per capita). We would expect market size to be positively correlated with FDI inflows.

We expect FDI flows to be affected by the level of infrastructure in a country. Infrastructure can impact production cost. But just as importantly in today's competitive environment, the quality of infrastructure affects firms' global supply chain management. To be able to move products, parts, and services efficiently and promptly, a high level of infrastructure is necessary. The different types of infrastructure need to be considered including road and rail quality, port capacity, reliability of electricity, and in today's world, network readiness.

Institutional factors can impact the attractiveness of the business environment. The popularity of the Doing Business series of the World Bank and the proliferation of other indices that attempt to capture the business environment in different countries should not be surprising. Companies considering going global are sensitive to conditions in countries with which they lack familiarity. But rather than arguing that company decisions are driven by these indices and measures, we expect instead that contained in these

measures are factors such as investment protection and bureaucratic intervention which are important in the FDI decision of firms. Hence, while we expect these indices to be correlated with FDI flows, the indices are not the causes of FDI flows.

The level of corruption in a country can serve as a deterrent to FDI. In addition to directly increasing the cost of doing business should one choose to take part in this behavior, corruption may be indicative of other inefficiencies in an economy that will indirectly affect the cost of doing business. It may also be indicative of the business uncertainties one may face including such crucial elements as timely deliveries, capricious inspections, and dispute resolution. While directly measuring corruption is almost impossible for obvious reasons, organizations like Transparency International have developed indirect measures of corruption that may be used to study its impact on FDI.

The availability of labor and the quality of human capital are elements that many consider to be critical for FDI. While for simple production processes the availability of cheap, unskilled labor may be the most important determinant of FDI, for more sophisticated FDI, the quality of human capital is what matters most. We expect that FDI flows will be partially explained by both labor size and the level of education of the labor force.

A country's trade orientation and its global readiness are also factors that can be expected to explain FDI flows. As MNEs seek to expand markets and to develop a truly global supply chain, it cannot be assumed that MNEs will engage in FDI only to serve the host market or to export back to the home country. It is increasingly more likely that MNEs engage in FDI to establish a global supply chain that connects production and sales in a number of countries. If that is so, then countries with broad trade orientation, open trade policies and with supporting trade infrastructure are more likely to attract FDI today.

To summarize, we use existing FDI stock per capita as a measure of the presence of foreign companies in a country. The market's size and its growth rate are evaluated along two dimensions: sheer size (population) and effective purchasing power (real GDP per capita and the growth rate of real GDP per capita). Electricity consumption per capita is a proxy for a country's infrastructure conditions. Business environment is captured by total tax rate, investment protection index, cost of starting business and corruption. We assess labor quality using the rate of secondary school enrollment. Finally, trade volume as a percentage of GDP is regarded as a measure of a country's trade orientation. We provide further details on the data sources and the construction of the variables in the Data Appendix.

Single Equation Model and Estimation Results

We first assess the effects of the aforementioned factors using a simple linear regression model. In practice, there is typically a lag of at least one year between the decision to invest in a country and when the investment is actually made and recorded in the statistics of a country. To account for this time lag, we run regressions using lagged one year values of the explanatory variables. The model is thus specified as follows:

$$y_{it} = \alpha_{it} + \beta X_{it-1} + \varepsilon_{it}, \quad (1)$$

where y_{it} is the ratio of FDI share to GDP share for country i in year t, α_{it} is the time and country specific intercept term, X_{it} is a vector of the explanatory variables for country i in year t, and ε_{it} is the error term. Specifically, X consists of log of population, log of real GDP per capita, growth rate of GDP per capita, electricity consumption per capita, total tax rate as a percentage of commercial profits, investment protection index, cost of business start-up procedures as a percentage of GNI per capita, corruption perceptions index, secondary school enrollment as percentage of gross eligible population and trade as percentage of GDP.

First, we use F tests to check whether we can pool data across countries and/or over time. In other words, we test the null hypothesis that the intercepts α_{it} are equal across countries and/or over time. If we fail to reject the null of the poolability, the data are pooled. Otherwise, we apply a Hausman test to test if the random effects estimator is appropriate. The test results are in Table 2. The Hausman specification test

results indicate rejection of the null of random effect models at the 5% significance level. The F tests suggest that country fixed effects are significant at the 5% level while time effects are borderline significant at the 10% level. As a robustness check, we estimate the model with and without time effects.

TABLE 2
SPECIFICATION TESTS

Specification Tests	Test statistic	P-value
F test for country effects	5.48**	<0.0001
F test for time effects	1.66	0.10
Hausman test for fixed effects	38.18**	<0.0001

Notes: *and** indicate the rejection at the 10% and 5% levels, respectively.

Table 3 shows the estimation results for the sample countries. In the model with country fixed effects only, at the 5% significance level, a one percent increase in population contributes to a 2.2526 increase in the FDI share to GDP share, a one percent increase in real GDP per capita leads to a 0.8743 increase in the FDI share to GDP share, a one unit increase in the corruption index (the higher the index, the lower the corruption level) raises the FDI share to GDP share by 0.2060, and a one percent increase in trade as percentage of GDP leads to a 0.0078 increase. The estimated coefficients of the cost of business start-up procedures as a percentage of GNI per capita are also statistically significant. However, they do not have the hypothesized signs. Adding time effects leads to some changes in the estimated coefficients. First, the log of FDI stock per capita becomes significant at the 5% level, with a one percent increase resulting in a 0.2797 rise in the FDI share to GDP share. Second, the log of real GDP per capita is no longer statistically significant. Third, the coefficients of cost of business start-up procedures, the corruption index and trade remain significant albeit with small changes in magnitude. To sum up, results in Table 3 suggest that agglomeration, market size, business environment, corruption and trade orientation are the main determinants of FDI allocation, while electricity consumption and the rate of secondary school enrollment do not matter.

Simultaneous Equation Models and Estimation Results

In the previous section, we estimated the effects of the set of variables on the FDI flow using a single linear equation. The implied assumption is that only one such relation as specified in equation (1) exists among the variables. One apparent omission is the contribution of the FDI flow to the FDI stock. On one hand, larger FDI stock can lead to more FDI flow via "agglomeration effects", and on the other hand, bigger FDI flow adds to higher FDI stock. Out of this consideration, we treat the two variables, the FDI stock and FDI flow, as endogenous variables, determined by a set of exogenous determinants. We estimate the following two Simultaneous Equations (SE) models. Equation (1.1) of SE Model 1 is exactly the same as equation (1). The only difference is that we express X_{it-1} as $[S_{it-1}, M_{it-1}]$, where M_{it-1} includes all explanatory variables other than the FDI stock per capita. Equation (1.2) states that the current FDI stock is determined by previous FDI stock and current inflows. Note that S_{it} and F_{it} are not the raw series of the FDI stock and flow, and therefore we cannot specify this accumulation process as an identity. Alternatively, in SE model 2, we specify the FDI stock as determined by exogenous factors grouped under M_{it-1} in equation (2.2), while the agglomeration effect is arranged formally as equation (2.1).

SE Model 1

$$F_{it} = \alpha_0 + \alpha_1 S_{it-1} + \alpha_2 M_{it-1} + \varepsilon_{it} \quad (1.1)$$

$$S_{it} = \beta_0 + \beta_1 S_{it-1} + \beta_2 F_{it} + \mu_{it} \quad (1.2)$$

SE Model 2

$$F_{it} = \alpha_0 + \alpha_1 S_{it-1} + \varepsilon_{it} \quad (2.1)$$

$$S_{it} = \beta_0 + \beta_1 S_{it-1} + \beta_2 M_{it-1} + \mu_{it} \quad (2.2)$$

TABLE 3
SINGLE EQUATION ESTIMATIONS OF DETERMINANTS OF FDI INFLOWS TO 75 MIDDLE- AND LOW-INCOME COUNTRIES, 2001-2009

Dependent variable	Share of FDI to share of GDP			
	Country Fixed Effects		Country Fixed Effects and Time Fixed Effects	
Determinants	Estimate	*t-Value*	Estimate	*t-Value*
Lag ln(FDI stock per capita)	0.1973	*1.61*	0.2797**	*1.99*
Lag ln(Population)	2.2526**	*2.05*	2.7639*	*1.65*
Lag ln(Real GDP per capita)	0.8743**	*1.79*	0.9002	*1.47*
Lag Real GDP growth rate	-0.0069	*-0.59*	-0.0108	*-0.88*
Lag ln(Electric power consumption per capita)	-0.3698	*-1.12*	-0.3439	*-1.04*
Lag Strength of investor protection index (0 to 10)	-0.0022	*-.02*	0.0426	*0.38*
Lag Total tax rate (% of commercial profits)	-0.0048	*-1.32*	-0.0048	*-1.33*
Lag Cost of business start-up (% of GNI per capita)	0.0019**	*2.02*	0.0020**	*2.08*
Lag Corruption Perceptions Index (0 to 10)	0.2060**	*2.31*	0.2012**	*2.27*
Lag Secondary school enrollment (% gross)	-0.0001	*-0.01*	0.0005	*0.06*
Lag Trade (% of GDP)	.0078**	*2.18*	0.0071**	*1.99*

Notes: *and** indicate the rejection at the 10% and 5% levels, respectively. Number of cross sections is 75 and number of time periods is 9.

Table 4 presents the estimation results for SE model 1. Compared with the single equation estimation, the agglomeration effect is larger and more significant in the SE model 1. A one percent increase in the FDI stock gives rise to a 0.6421 increase to the FDI share to GDP share in question (1.1) compared to a 0.1973-0.2797 increase in the single equation (1). In other words, the agglomeration effect is more pronounced when we account for the dynamic interactions between the FDI stock and FDI flow. The coefficients of real GDP growth rate, total tax rate, the cost of business start-up, corruption index and secondary school enrollment all have hypothesized signs and are significant at the 5% level. To be specific, a one percent increase in real GDP growth rate contributes to a 0.0512 increase in the FDI share to GDP share, a one percent increase in total tax rate leads to a 0.0034 decline in the FDI share to GDP share, a one percent increase in the cost of business start-up is associated with a 0.0009 drop in the FDI share to GDP share, a one unit increase in the corruption index (the higher the index, the lower the corruption level) raises the FDI share to GDP share by 0.1527, and a one percent increase in the secondary school enrollment leads to a 0.0059 increase. Population, real GDP per capita and trade yield

significant coefficients, but not the anticipated signs. The estimated coefficients in the accumulation equation (1.2) are as expected. The lagged FDI stock has a coefficient of 0.9827 and the share of FDI to share of GDP has a coefficient of 0.0412, and both are significant at the 5% level.

TABLE 4
SE MODEL 1 ESTIMATIONS OF DETERMINANTS OF FDI INFLOWS TO 75 MIDDLE- AND LOW-INCOME COUNTRIES, 2001-2009

	Dependent variable			
	Share of FDI to share of GDP (1.1)		FDI stock per capita (1.2)	
Determinants	Estimate	*t-Value*	Estimate	*t-Value*
Lag ln(FDI stock per capita)	0.6421**	*12.11*	0.9827**	*163.82*
Lag share of FDI to share of GDP (not lagged for 1.2)	-	-	0.0412**	*5.85*
Lag ln(Population)	-0.1693**	*-6.49*	-	-
Lag ln(Real GDP per capita)	-0.9243**	*-10.80*	-	-
Lag Real GDP growth rate	0.0512**	*4.73*	-	-
Lag ln(Electric power consumption per capita)	0.0723	*0.98*	-	-
Lag Strength of investor protection index (0 to 10)	0.0120	*0.42*	-	-
Lag Total tax rate (% of commercial profits)	-0.0034**	*-2.01*	-	-
Lag Cost of business start-up (% of GNI per capita)	-0.0009*	*-1.69*	-	-
Lag Corruption Perceptions Index (0 to 10)	0.1527**	*3.70*	-	-
Lag Secondary school enrollment (% gross)	0.0059**	*2.18*	-	-
Lag Trade (% of GDP)	-0.0025**	*-2.11*	-	-

Notes: *and** indicate the rejection at the 10% and 5% levels, respectively. Number of cross sections is 75 and number of time periods is 9.

Table 5 shows the results for the alternative specification, SE model 2. The agglomeration effect is still significant in equation (2.1). A one percent increase in the log FDI stock per capita raises the FDI share to GDP share by 0.3652, smaller than the estimate from the SE model 1 while larger than that from the single equation model. The estimation results for equation (2.2) show that the FDI stock per capita appears to be very persistent and the estimated coefficient of the lagged FDI stock per capita is about 0.94. In addition, a one percent rise in real GDP per capita and real GDP growth rate increase the FDI stock per capita by 0.0792 and 0.0063 percent respectively. The cost of business start up also has a significant coefficient. However, it does not have the hypothesized sign. The rest of the factors are not significantly correlated with the current FDI stock per capita once we include the lagged value of FDI stock per capita. This is not surprising as the FDI stock per capita is a stock variable and its current level is the result of the influence of these factors over time and not just in a single period.

In summary, among the factors we examined, the agglomeration effect is robust against different model specifications, suggesting that the MNEs have the tendency to invest in countries that are already heavily invested by foreign companies. Our analysis also suggests that countries can take certain

measures to attract foreign direct investment, though we come to slightly different conclusions as to what factors are most influential depending on model specifications.

TABLE 5
SE MODEL 2 ESTIMATIONS OF DETERMINANTS OF FDI INFLOWS TO 75 MIDDLE- AND LOW-INCOME COUNTRIES, 2001-2009

	Dependent variable			
	Share of FDI to share of GDP (2.1)		FDI stock per capita (2.2)	
Determinants	Estimate	*t-Value*	Estimate	*t-Value*
Lag ln(FDI stock per capita)	0.3652**	*12.29*	0.9385**	*82.50*
Lag share of FDI to share of GDP	-	-	-	-
Lag ln(Population)	-	-	0.0012	*0.21*
Lag ln(Real GDP per capita)	-	-	0.0792**	*4.35*
Lag Real GDP growth rate	-	-	0.0063**	*2.73*
Lag ln(Electric power consumption per capita)	-	-	0.0193	*1.24*
Lag Strength of investor protection index (0 to 10)	-	-	-0.0049	*-0.80*
Lag Total tax rate (% of commercial profits)	-	-	-0.0004	*-1.04*
Lag Cost of business start-up (% of GNI per capita)	-	-	0.0002**	*2.07*
Lag Corruption Perceptions Index (0 to 10)	-	-	-0.0051	*-0.58*
Lag Secondary school enrollment (% gross)	-	-	0.0005	*0.91*
Lag Trade (% of GDP)	-	-	0.0003	*1.11*

Notes: *and** indicate the rejection at the 10% and 5% levels, respectively. Number of cross sections is 75 and number of time periods is 9.

CONCLUSION

Foreign Direct Investment (FDI) as a source of economic development plays an important role in financing investment and growth for developing countries. We find that the distribution of FDI among developing countries is very uneven, suggesting that some countries are much better in attracting FDI than others. This paper aims to find out influential factors in determining the FDI flows. We look at factors including agglomeration, market size, infrastructure, business environment, corruption, human capital, and trade orientation.

We first estimated a single equation model of the FDI share to GDP share onto measures of the aforementioned factors. The empirical results show that the existing FDI stock, population, real GDP per capita, corruption level, and linkage with the global market through trade are important factors in determining FDI inflow to the developing countries. To obtain more accurate estimation results, we used a simultaneous equations model to account for the bidirectional determination between the FDI stock and FDI flow. This more comprehensive model reveals larger and significant agglomeration effects and at the same time, suggests countries with higher GDP growth rate, lower tax rate, smaller cost of business start-up, less corruption and higher secondary school enrollment are more successful in attracting FDI.

The empirical findings in this paper are relevant for both MNEs and potential recipient countries. Our findings provide answers to what makes a successful location choice for MNEs' investment, and point to

the significant factors that potential recipient countries should focus on to attract more FDI. There has been a growing literature in studying FDI flows in a bilateral setup. It would be interesting to expand our analysis framework to bilateral FDI data. We leave that to future research.

REFERENCES

Agodo, O. (1978). The Determinants of U. S. Private Manufacturing Investments in Africa. *Journal of International Business Studies*, 9 (3), 95-107.

Alfaro, L. et al. (2010). Does Foreign Direct Investment Promote Growth? Exploring the Role of Financial Markets on Linkages. *Journal of Development Economics*, 91 (2), 242-256.

Asiedu, E. (2002). On the Determinants of Foreign Direct Investment to Developing Countries: Is Africa Different? *World Development*, 30 (1), 107-119.

Bandelj, N. (2002). Embedded Economies: Social Relations as Determinants of Foreign Direct Investment in Central and Eastern Europe. *Social Forces*, 81 (2), 411-444.

Barrell, R. & Pain, N. (1999). Domestic Institutions, Agglomerations and Foreign Direct Investment in Europe. *European Economic Review,* 43, 925-934.

Bennett, P. & Green, R. (1972). Political Instability as a Determinant of Direct Foreign Investment in Marketing. *Journal of Marketing Research*, 9 (2), 182-186

Borensztein, E., DeGregorio, J. & Lee, J.W. (1998). How Does Foreign Direct Investment Affect Economic Growth? *Journal of International Economics,* 45, 115–35.

Chakrabarti, A. (2001). The Determinants of Foreign Direct Investments: Sensitivity Analyses of Cross-Country Regressions. *Kyklos*, 54 (1), 89-114.

Chang, J. & Park, S. (2005). Types of Firms Generating Network Externalities and MNCs' Co-Location Decisions. *Strategic Management Journal*, 26 (7), 595-615.

Cuervo-Cazurra, A. (2006). Who Cares about Corruption*? Journal of International Business Studies*, 37 (6), 807-822.

De Mello, L. (1999). Foreign Direct Investment-Led Growth: Evidence from Time Series and Panel Data. *Oxford Economic Papers*, 51 (1), 133-151.

Deichmann, J. et al. (2003). Foreign Direct Investment in the Eurasian Transition States. *Eastern European Economics*, 41(1) 5-34.

Dunning, J. (1993). *Multinational Enterprises and the Global Economy.* Harlow: Addison-Wesley.

Galan, J., Gonzalez-Benito, J. & Zuniga-Vincente, J. (2007). Factors Determining the Location Decisions of Spanish MNEs: An Analysis Based on the Investment Development Path. *Journal of International Business Studies*, 38 (6), 975-997.

Gastanaga, V. et al. (1998). Host Country Reforms and FDI Inflows: How Much Difference Do They Make? *World Development*, 26 (7), 1299-1314.

Grossman, G. & Helpman, E. (1991). *Innovation and Growth in the Global Economy*. Cambridge, MA: MIT Press.

Habib, M. & Zurawicki. L. (2002). Corruption and Foreign Direct Investment. *Journal of International Business Studies*, 33(2), 291-307.

Harding, T. & Javorcikr, B. (2007). Developing Economies and International Investors: Do Investment Promotion Agencies Bring Them Together? *Policy Research Working Paper 4339,* Washington, D.C.: The World Bank Group.

Henisz, W. & Macher, J. (2004). Firm- and Country-Level Trade-Offs and Contingencies in the Evaluation of Foreign Investment: The Semiconductor Industry, 1994-2002. *Organization Science*, 15 (5), 537-554.

Hymer, S. (1976). *The International Operations of National Firms: A Study of Direct Investment*. Cambridge: Massachusetts Institute of Technology Press.

IMF (2003). *Foreign Direct Investment in Emerging Markets*. Report of the Working Group of the Capital Markets Consultative Group. Washington, D.C.: International Monetary Fund.

Kindleberger, C. (1969). *American Business Abroad*. New Haven: John Wiley Co.

Lall, S. & Streeten, P. (1977). *Foreign Investment, Transnationals and Developing Countries.* Boulder, CO: Westview Press.

Lim, E. (2001). Determinants of, and the Relation Between, Foreign Direct Investment and Growth: A Summary of the Recent Literature. *IMF Working Paper 01/175,* Washington, D.C.: International Monetary Fund.

Markusen, J. (1995). The Boundaries of Multinational Enterprises and the Theory of International Trade. *The Journal of Economic Perspectives*, 9 (2), 169-189.

Mitra, D. & Golder, P. (2002). Whose Culture Matters? Near-Market Knowledge and Its Impact on Foreign Market Entry Timing. *Journal of Marketing Research*, 39 (3) 350-365.

Nigh, D. (1986). Political Events and the Foreign Direct Investment Decision: An Empirical Examination. *Managerial and Decision Economics,* 7 (2), 99-106.

Shaver, J., Mitchell, W. & Yeung, B. (1997). The Effect of Own-Firm and Other-Firm Experience on Foreign Direct Investment Survival in the USA, 1987-92. *Strategic Management Journal,* 18 (10), 811-824.

The World Bank Group and International Finance Corporations. *Doing Business (various editions).* Washington, D.C.: The World Bank.

Zhang, K. & Markusen, J. (1999). Vertical Multinationals and Host-Country Characteristics. *Journal of Development Economics*, 59, 233-252.

APPENDIX 1

Data on foreign direct investment (FDI) inflows and stocks are from UNCTAD, Division on Investment and Enterprise. FDI inflows comprise capital received by a foreign direct investor from a FDI enterprise. FDI includes the three following components: equity capital, reinvested earnings and intra-company loans. Data on FDI flows are presented on net bases (capital transactions' credits less debits between direct investors and their foreign affiliates). Net decreases in assets or net increases in liabilities are recorded as credits, while net increases in assets or net decreases in liabilities are recorded as debits. Hence, FDI flows with a negative sign indicate that at least one of the three components of FDI is negative and not offset by positive amounts of the remaining components. These are called reverse investment or disinvestment.

The Corruption Perceptions Index (CPI) data are extracted from publications by Transparency International (TI). Countries are ranked on a scale from 10 (very clean) to 0 (highly corrupt) by their perceived levels of corruption, as determined by expert assessments and opinion surveys.

Data on population, nominal and real GDP, electric power consumption per capita, strength of investor protection index, total tax rate, cost of business start-up, secondary school enrollment and trade are from the World Bank database. Note that real GDP per capital is measured in constant 2000 dollars.

Missing data are interpolated using the Last observation carried forward (LOCF) method. For each series, missing values are replaced by the last observed value of that variable.

Table A.1 presents the list of 75 countries in our sample based on the World Bank's income classification as of 2000. A few countries migrated from one income group to another during our sample period.

TABLE A1
LIST OF 75 COUNTRIES BY WORLD BANK INCOME CLASSIFICATION 2000

Income Group	Countries
Low	Bangladesh, Benin, Cambodia, Ethiopia, Guinea-Bissau, Kenya, Kyrgyzstan, Mozambique, Nepal, Tanzania, Togo
Lower Middle	Armenia, Belize, Bolivia, Cameroon, Cape, Verde, Cote d'Ivoire, Egypt, El Salvador, Georgia, Ghana, Guatemala, Guyana, Honduras, India, Indonesia, Lesotho, Moldova, Mongolia, Morocco, Nicaragua, Nigeria, Pakistan, Paraguay, Philippines, Senegal, Sri Lanka, Swaziland, Syria, Ukraine, Vanuatu, Vietnam, Yemen
Upper Middle	Albania, Algeria, Argentina, Belarus, Bosnia and Herzegovina, Botswana, Brazil, Chile, China, Colombia, Costa Rica, Croatia, Dominican Republic, Ecuador, Gabon, Iran, Jamaica, Jordan, Kazakhstan, Malaysia, Mauritius, Mexico, Namibia, Panama, Peru, South Africa, Thailand, Trinidad and Tobago, Tunisia, Turkey, Uruguay, Venezuela