FDI and Economic Growth: The Role of Local Financial Markets*

Laura Alfaro
Harvard Business School†

Areendam Chanda
Brown University‡

Sebnem Kalemli-Ozcan
University of Houston§

Selin Sayek
Bentley College¶

November 2000

Abstract

The purpose of this paper is to examine the various links among foreign direct investment, financial markets and growth. We model an economy with a continuum of agents indexed by their level of ability. Agents have two choices: they can work for the foreign company in the FDI sector and use their wealth to earn a return or they can choose to undertake entrepreneurial activities, which are subject to a fixed cost. Better financial markets allow agents in the economy to take advantage of knowledge spillovers from FDI. The empirical evidence suggests that FDI plays an important role in contributing to economic growth. However, the level development of local financial markets is crucial for these positive effects to be realized.

JEL Classification: F23, F36, F43

*We thank Ross Levine, Eduardo Borenzstein and Edmundo Murrugarra for their help with the data. We received valuable comments from the participants of the macro seminar at Brandeis University and University of Houston.

†lalfaro@hbs.edu

‡chanda@chico.pstc.brown.edu

§Sebnem.Kalemli-Ozcan@mail.uh.edu

¶ssayek@bentley.edu

1 Introduction

"In a trade English capital is instantly at the disposal of persons capable of understanding the new opportunities and making good use of them. In countries where there is little money to lend enterprising traders are long kept back, because they cannot at once borrow the capital, without which skill and knowledge are useless."

Bagehot, 1873.[1]

The 1990s have been marked by the increasing role of foreign direct investment (FDI) in total capital flows (See Table 1). In 1998, more than half of all private capital flows to developing countries was accounted by FDI.[2] Following the 1980s debt crisis, and recently the 1997 turmoil in the emerging economies, the emphasis among policymakers in developing countries has shifted towards attracting more FDI. Their arguments have been supported by the international institutions and policymakers as well, as is evident in the World Development Report (2000): " Since 1997, when the East Asian crisis began, the world has learned that poorly managed financial liberalization can lead to a protracted economic downturn and a renewed cycle of poverty. But the potential upside of international capital flows is enormous, as the positive contribution of foreign direct investment to boosting productivity in recipient countries demonstrates." This report specifically emphasizes the policies and reforms developing countries can pursue to attract more FDI.

The rationale for such increased efforts to attract more FDI stems from the belief that FDI has several positive effects which include productivity gains, technology transfers, the introduction of new processes to the domestic market, managerial skills and know-how, employee training, international production networks, and access to markets.[3] In addition to these real benefits, its relative stability has also increased the emphasis on FDI among all capital flows.[4] Either by learning-by-observing or learning-by-doing, foreign production may

[1] Cooley and Smith(1998).

[2] IMF, Balance of Payments Statistics Yearbook (1998), World Development Report (2000). Also see Aitken and Harrison (1999).

[3] See Caves (1996) for a discussion on technology transfers.

[4] Following the East Asian financial crisis, studies of capital flows have focused on their relative volatility, and on how volatility has caused economic decline and instability; further strengthening the importance of more long-term investment. Fernandez-Arias et al (2000), Soto (2000) and WDR (1999) have shown that FDI, which is driven by longer-term decision making, was much less volatile compared to commercial bank loans and foreign portfolio flows during the period 1992-97.

increase domestic productivity and the overall economic growth in the domestic economy. Domestic firms may benefit from accelerated diffusion of new technology if foreign firms introduce new products or processes to the domestic market. In some cases, domestic firms might benefit just from observing these foreign firms (Blomstrom and Kokko, 1997). In other cases, technology diffusion might occur from labor turnover as domestic employees move from foreign to domestic firms.[5] These benefits together with the direct capital financing it provides, suggest that FDI can play an important role in modernizing the national economy and promote growth.

However, sometimes there tend to be excessive expectations of what FDI can really achieve for a country. While it can contribute to the development efforts of a country, domestic market conditions are crucial in determining not only the quantity but also the quality of FDI. These conditions include −but are not limited to− the policy environment of the local country, productive assets available, and infrastructure.[6]

Among these conditions, we believe that the development of local financial markets in particular can adversely limit the economy's ability of taking advantage of such potential FDI spillovers. As McKinnon (1973) stated, the development of capital markets is "necessary and sufficient" to foster the "adoption of best-practice technologies and learning by doing." In other words, limited access to credit markets restricts entrepreneurial development. If entrepreneurship allows greater assimilation and adoption of best technological practices made available by FDI, then the absence of well developed financial markets limit the potential positive FDI externalities. In this paper we formalize the mechanism through which the trickle down effect of foreign direct investment depends on the extent of the development of the financial sector. It is then shown empirically that this is indeed an important channel via which FDI enhances growth. To the best of our knowledge, there has been no formalization of the interaction between financial markets and FDI spillovers prior to this study.[7]

[5]Using a panel on Venezuelan plants, Aitken and Harrison (1999) find a small net impact of foreign investment. Branstetter (2000) finds evidence that FDI increases the flow of knowledge spillovers both from and to Japanese multinationals undertaking direct investment in the US. Using different data sets, both Borensztein et al. (1998) and Xu (2000) find that countries need to reach a minimum human capital threshold level in order to benefit from the technology transfer.

[6]A very broad definition of higher-quality FDI is "investments with strong links to the domestic economy, export orientation, advanced technology and skill or spillover effects" (World Investment Report 2000, UNCTAD).

[7]For technology diffusion models see Grossman and Helpman (1991) and Barro and Sala-i-Martin (1995,

We model an economy populated by agents who are differentiated by their ability level. Agents have two choices. They can simply work for the foreign company in the FDI sector and use their inherited wealth to earn a return. Or they can choose to set up their own firm, which will benefit from a spillover due to foreign direct investment. However, starting a firm requires a setup cost which must be partly financed through borrowing from financial institutions. Due to inefficiencies in the financial sector, the borrowing rate is assumed to be higher than the lending rate. Under this scenario, better developed financial institutions are likely to make it easier for entrepreneurs to set up business. This not only spurs entrepreneurial activity but more importantly, enables entrepreneurs to reap the spillovers from foreign direct investment. This implies that FDI will have effects in the local economy that go beyond the direct increase in capital from abroad.

The model provides a benchmark for empirical analysis. We attempt to shed light on the debates of how long-term foreign investment in the form of FDI might impact the host economy, as well as test whether the theoretical predictions hold empirically. Specifically, we examine whether economies that attract FDI are able to grow faster, and whether economies with better-developed financial markets are able to benefit from FDI even more. We find that FDI plays an important role in contributing to economic growth. However, the development level of local markets is crucial for these positive effects to be realized. Economic growth is impacted by FDI even more significantly if the host economy has a sufficiently developed local financial market. We also show that the positive spillovers of FDI on economic growth work through increasing domestic investment in the host economy. Our analysis, that is the development of local financial markets allows entrepreneurship to develop and take advantage of the "potential" FDI spillovers, has important ramifications when one considers the increased role of FDI throughout the world as depicted in the Table 1.[8] While bad financial

1997). Benhabib and Spiegel (1994) relate the technology absorption capacity to the level of human capital.

[8]The reasons for increased FDI can be grouped into two broad categories, increased demand among countries to attract more FDI (i.e. the pull argument) and increased supply of foreign capital (i.e. the push argument). Exchange rates, tax rates and regimes, inflation, market size and growth rate of the market, tariff barriers, unit labor costs and the domestic interest rates have been studied as possible candidates of "pull" indicators. Froot and Stein (1991) and Blonigen (1997), Klein and Rosengren (1994) study the importance of exchange rates; Hines (1996), Cummins and Hubbard (1995), Scholes and Wolfson (1990) and Swenson (1994) study the role of taxes on the FDI decision; Sayek (2000) and Wei (1997, 2000), Smarzynska and Wei (2000) study the importance of implicit taxes in addition to explicit taxes in the MNF decision process, by including inflation taxes and corruption into the analysis respectively. The classic locational advantages are found to be

markets may mean that a country is not in a position to prepare for unregulated short term capital flows, our work suggests that the full benefits of long term stable flows may also not be realized in the absence of well functioning financial markets.

The interaction between capital markets and FDI did not receive much attention until recently.[9] In a broader sense the benefits of all types of capital flows and capital market integration have been studied extensively in the literature. Well-integrated inter-regional and international capital markets allow insurance against idiosyncratic shocks, and allow better use of resources (Obstfeld 1994). In the standard one-good intertemporal model of trade, countries gain from borrowing or lending abroad when there is a difference between the economy's autarky interest rate and the world interest rate. Obstfeld's (1994) model shows that international financial integration can lead to higher growth as countries can take advantage of risky higher-yield bonds. In a similar framework of risk-return trade-off Acemoglu and Zilibotti (1997) show that developing countries tend to specialize in safe technologies due to less diversification opportunities. In particular, Tesar and Rowland's (2000) and Tesar and Hull's (2000) work shows that multinationals can allow for greater risk diversification.[10] Several other models, including Saint-Paul (1992), Feeney (1997) show the gains of capital market integration-induced specialization and production efficiency in a theoretical framework. Kalemli-Ozcan, Sorensen and Yosha (1999) test these theoretical predictions and find supporting evidence that risk-sharing, facilitated by favorable legal environments and well-developed financial systems, leads to specialization, which implies higher economic growth.

The most basic method of economic integration can be thought of as international trade in goods and ideas, which is shown by Rivera-Batiz and Romer (1991) to have additional potential advantages and growth effects. Grossman and Helpman (1991) show that countries may increase their growth rates by interacting with other countries and through knowledge diffusion. As Helpman (1997) states "...international trade and direct foreign investment pro-

significant determinants of FDI flows by Wheeler and Mody (1993), Singh and Jun (1995), and Dasgupta and Ratha (2000). The specific "push" factors studied include world interest rates and the world business cycles, which are found to be significant by Calvo et al (1996).

[9]Soto (2000) analyzes the role of "financial health" by interacting bank capitalization levels with bank-related capital flows; where he finds capitalized financial institutions to be an important precondition for economies to fully benefit from bank-related capital flows.

[10]Razin et al (1999) show that in an environment with asymmetric information, FDI can have positive welfare effects if credit markets are underdeveloped but these effects turn into losses in economies with well functioning domestic credit markets.

vide opportunities for cross-border learning in the normal course of business, which requires no special effort or investment of resources. This sort of learning applies to manufacturing techniques, organizational methods and market conditions. In either case the acquired knowledge improves domestic productivity." [11]It can be argued that companies learn more from the experiences of other producers located in the domestic market than from firms located abroad and spillovers might be limited in their geographical reach.[12]

While it may seem natural to argue that foreign direct investment can convey greater knowledge spillovers, a country's capacity to take advantage of these spillovers might be limited by local conditions. While this paper stresses the role of local financial markets, arguably another important factor is the stock of local human capital. Nelson and Phelps (1966) presented a model where the rate of growth of total factor productivity is a function of a country's human capital stock. To the extent that FDI brings with it knowledge spillovers which increases total factor productivity, the stock of human capital should play an important role in realizing the benefits of foreign direct investment. This line of thought is pursued in Borensztein et al (1998). Using a data set of FDI flows from industrialized countries to sixty-nine developing countries, they find that FDI is an important vehicle for the transfer of technology and higher growth. However, they show that the higher productivity is only possible when the host country has a minimum threshold stock of human capital. Likewise, Xu (2000) using a data set of US multinational enterprises (MNEs) finds that a country needs to reach a minimum human capital threshold level in order to benefit from the technology transfer of US MNEs, and that most LDCs do not meet this threshold requirement. However to the best of our knowledge, there has been no attempt at investigating the role of financial markets in influencing the effects of FDI on growth.

The interaction between financial markets and growth itself has lately received a lot of attention. As described above, the theoretical framework has been well-established in the literature, with supporting evidence in the empirical studies. King and Levine (1993a,b) model how better financial systems improve the probability of successful innovation and thereby accelerate growth and provide empirical evidence suggesting that financial systems are important for productivity growth and development. Analyzing the roles of different types of financial institutions Levine and Zervos (1998) show that stock markets and banks provide different services, but both stock market liquidity and banking development positively predict

[11]Helpman (1997).

[12]Grossman and Helpman (1995), Handbook of Economics III page 1296.

growth, capital accumulation and productivity improvements. At the country level, Beck, Levine and Loayza (2000a, 2000b) once again empirically show the positive effects of financial development on growth, and that these positive effects work through total factor productivity. At the industry level, Rajan and Zingales (1998) find that the state of financial development reduces the cost of external finance to firms, thereby promoting growth. Combining industry and country level, Wurgler (2000) shows that even if financial development does not lead to higher levels of investment, it seems to allocate the existing investment better and hence causing economic growth. Finally, as mentioned above, Kalemli-Ozcan et al (1999) focus on the channel through which these growth effects of financial markets can be possible and provide evidence that more integrated capital markets enhance specialization in production.

The rest of the paper is organized as follows. A benchmark model is developed in Section 2, and is used to motivate the empirical testing. The data is defined in Section 3, the empirical results are discussed in Section 4, and Section 5 concludes.

2 A Conceptual Framework

We present a simple model that illustrates how improvements in the financial markets influence the effects of FDI on domestic production. We assume a small open economy with no adjustment costs. The economy is populated with a continuum of agents of total mass 1. Each agent lives for one period. There are two sectors in the economy, the foreign-production sector Y^{FDI}, and the domestic-production one, $Y^{Domestic}$.

2.1 Production

Sectors are distinguished by their ownership, the technology and the inputs that they use. The foreign production sector, denoted Y^{FDI}, is assumed to be owned wholly by foreign investors and uses foreign capital and domestically supplied labor. We assume, following Razin, et al (1999), that home investors who lack access to foreign capital markets can not challenge the foreign direct investors in this sector. [13] The Industrial Organization (IO) view of FDI , since Hymer (1960) and Vernon (1966), stresses that FDI occurs not because of cost of capital differences but because certain domestic assets are worth more under foreign

[13] Alternatively, foreign firms can be thought of as owning the technology to produce in this sector and because of its special characteristics (asset specific) they choose to directly produce in the country rather than to license the technology.

control.[14] Following Froot and Stein (1991), we disregard differences in managerial abilities that come from the IO view of FDI. We assume that FDI is attracted to the country because of cost of capital differences.[15]

Production is perfectly competitive and technology is assumed to be of the Cobb-Douglas constant returns to scale variety,

$$Y_t^{FDI} = AL_t^{\beta}\left(K_t^{fdi}\right)^{1-\beta} \tag{1}$$

where $0 < \beta < 1, L_t$ denotes the domestic labor, K_t^{fdi} is the stock of foreign capital, and A is a productivity parameter. Optimality conditions in the FDI sector imply that foreign capital is paid its marginal product which is given by the international rate of interest, r,

$$r = (1-\beta)AL_t^{\beta}\left(K_t^{fdi}\right)^{-\beta}$$

Rearranging we get an expression for the stock of foreign capital,

$$K_t^{fdi} = \left(\frac{(1-\beta)A}{r}\right)^{\frac{1}{\beta}} L_t \tag{2}$$

The foreign firm hires workers up to the point were the marginal productivity of an extra worker equals the wage, w,

$$w = \beta A^{\frac{1}{\beta}}\left(\frac{(1-\beta)}{r}\right)^{\frac{1-\beta}{\beta}}$$

The second sector, $Y^{Domestic}$, is composed of a number of firms, Y^i, each of which is owned by a local entrepreneur. Production in each firm requires a fixed capital investment. In addition to the fixed capital investment, output is positively affected by the entrepreneur's ability and by the amount of foreign capital in the economy. [16]

Local entreprenuers benefit from spillovers from the FDI sector. This assumption is central to the model. [17] Potential entrepreneurs can take advantage of better managerial practices, networks, access to markets, and other spillovers from the foreign firms located in

[14]Helpman (1984,1985) models the multinational corporation by incorporating monopolistic competition, economies of scale, differentiated products, inputs (managerial, marketing, R+D) that can serve different product lines without being located in the same plant. See Caves 1996 for a survey and review of the literature.

[15]Our objective is to understand the effect of foreign production on local output and the role of financial markets and not the decision to invest abroad.

[16]The assumption of entrepreneurial ability is important to rule out corner solutions as will be evident later.

[17]Blomstrom and Kokko (1997) mention three different means of such spillovers from the MNF to the local

the domestic country. These positive effects are not internalized by the foreign firm. Output in this sector is given by:

$$Y_t^{Domestic} = \int_{\varepsilon_t^*}^{1} Y_t^i d\varepsilon$$

where:

$$Y_t^i = \varepsilon_{i,t} B \left(K_t^{fdi}\right)^{\theta} S^{\gamma} \tag{3}$$

where $0 < \gamma < 1$,$0 < \theta < 1$, i is associated with an entrepreneur of ability level ε_i, S is the fixed capital investment. We assume that the fixed investment S is more than what any single individual has at any point in time. Local entrepreneurs can borrow the difference between their endowment and S in the local market.[18] In the financial market, there is a wedge δ between the lending rate, r and the borrowing rate i. The difference δ reflects the inefficiencies in the financial sector.[19] This wedge could reflect taxes, interest ceilings, required reserve policies, as King and Levine (1991) mention, or in general high intermediation costs due to labor regulation, high administration costs, low technology, etc.

2.2 Household and Occupational Choice

The economy is populated by a continuum of agents of total mass 1. They are all endowed with one unit of labor but they differ in their ability level. For example, upon birth, individual i at time t is endowed with ε_t^i, where ε_t^i is iid, uniformly distributed over $\varepsilon_t^i \in (0, 1)$. ε_t^i is realized at the beginning of the period. Agents are all endowed with some initial wealth b_{t-1}^i on which they can earn the international return r at the end of the period should they choose to invest it in capital markets. Initially, we assume that $b_{t-1}^i = b_{t-1}$ for all i.

markets. The first one is due to linkages in the market. Backward and forwards linkages between the foreign and domestic firms create an environment where the foreign processes can be easily learned by the domestic firms. Training of the local workers in the FDI industry also allows such spillovers. They define "demonstration effects", which are possible due to the competition between the domestic firms and the MNF. Similar effects are mentioned in Aitken and Harrison (1999).

[18] Because of information asymmetries plus sovereign risk it is costly or impossible for entrepreneurs to finance abroad or directly through the stock market. See Stiglitz and Weiss (1982) for adverse selection, Townsend (1979) for costly state verification. See Froot and Stein (1991) for an application in FDI.

[19] Galor and Zeira (1993) adopt a similar strategy to allow for capital market imperfections.

All individuals consume and leave bequests b_t^i at the end of the period t.[20] At the beginning of period t, each agent faces two choices. They can choose to work for the foreign firm in the FDI sector. Alternatively, the agent can become an entrepreneur and work in the domestic-production sector.

If the agent chooses to work for the foreign company, they inelastically supply their labor endowment and earn a wage w. The wage w is independent of the agent's ability level. Agents who choose to work for the foreign company earn an income stream equal to the wage plus the return on their level of assets

$$w + (1 + r)b_{t-1}$$

Those who choose to produce must pay their loans at the end of the period and therefore earn a net income of

$$Y_t^i - (1 + i)(S - b_{t-1})$$

An individual chooses to work for the foreign company if the income he or she earns is higher than that in the entrepreneurial sector:

$$w + (1 + r)b_{t-1} > Y_t^i - (1 + i)(S - b_{t-1})$$

alternatively, he or she chooses to start a firm if

$$w + (1 + r)b_{t-1} < Y^i - (1 + i)(S - b_{t-1})$$

An agent is indifferent between working for the foreign firm or starting its own firm if

$$w + (1 + r)b_{t-1} = Y_t^i - (1 + i)(S - b_{t-1}) \tag{4}$$

The above equation characterizes the break even level of ability and therefore also the measure of people that work for the foreign sector. Substituting the output Y_t^i, using equation (3), we obtain:

$$w + (1 + r)b_{t-1} = \varepsilon_{i,t} B \left(K_t^{fdi}\right)^{\theta} S^{\gamma} - (1 + i)(S - b_{t-1}) \tag{5}$$

[20] Aghion and Bolton (1997) also adopt a similar approach in that they assume economic life is relegated to only one period.

With a uniform distribution, we obtain the following expression for $\varepsilon_{i,t}$,

$$\varepsilon_{i,t} = \frac{(1+i)(S-b_{t-1}) + w + (1+r)b_{t-1}}{B\left(K_t^{fdi}\right)^{\theta} S^{\gamma}} \tag{6}$$

Let ε_t^* denote the value of ability that satisfies the above condition. This means that the total amount of labor employed in the FDI sector will be,

$$L_t = \int_0^{\varepsilon^*} \varepsilon_{i,t} di = \varepsilon^* \tag{7}$$

¿From equations (2) and (7), we can rewrite the amount of foreign capital as

$$K_t^{fdi} = \left(\frac{(1-\beta)A}{r}\right)^{\frac{1}{\beta}} \varepsilon_t^*$$

Substituting this expression in equation (6) above and rearranging gives us the threshold level of entrepreneurial ability,

$$\varepsilon_t^* = \left[\frac{(1+i)(S-b_{t-1}) + \beta A^{\frac{1}{\beta}} \left(\frac{(1-\beta)}{r}\right)^{\frac{1-\beta}{\beta}} + (1+r)b_{t-1}}{B\left(\frac{A(1-\beta)}{r}\right)^{\frac{\theta}{\beta}} S^{\gamma}}\right]^{\frac{1}{1+\theta}} \tag{8}$$

2.3 Comparative Statics

The model allows us to understand how FDI will impact output in this economy, and how this effect depends on the local financial market conditions.

Increased FDI has two effects on production. It increases the output produced in the FDI sector and also causes output to go up in the domesitic sector. Note that the total output in the economy is:

$$Y_t = Y_t^{FDI} + \int_{\varepsilon_t^*}^1 Y_t^i d\varepsilon$$

This implies,

$$Y_t = Y_t^{FDI} + (1-\varepsilon_t^*)\, B\left(K_t^{fdi}\right)^{\theta} S^{\gamma}$$

The total effect of FDI on output is therefore the sum of the private marginal product of FDI in its own sector plus the difference between the social and the private marginal product:

$$\frac{\partial Y_t}{\partial K_t^{fdi}} = \frac{\partial Y_t^{FDI}}{\partial K_t^{fdi}} + \frac{\partial[(1-\varepsilon_t^*)\, B\left(K_t^{fdi}\right)^{\theta} S^{\gamma}]}{\partial K_t^{fdi}}$$

$$\Rightarrow \frac{\partial Y_t}{\partial K_t^{fdi}} = r + (1-\varepsilon_t^*)\, B\theta\left(K_t^{fdi}\right)^{\theta-1} S^{\gamma} > 0$$

Financial intermediation in this model affects the social marginal product of FDI. The total effect is therefore,

$$\frac{\partial^2 Y_t}{\partial K_t^{fdi}\partial\delta} = -B\theta\left(K_t^{fdi}\right)^{\theta-1} S^{\gamma}\frac{\partial\varepsilon_t^*}{\partial\delta} + (1-\varepsilon_t^*)\, B\theta(\theta-1)\left(K_t^{fdi}\right)^{\theta-2} S^{\gamma}\frac{\partial K_t^{fdi}}{\partial\varepsilon_t^*}\frac{\partial\varepsilon_t^*}{\partial\delta} \tag{9}$$

$$\Rightarrow \frac{\partial^2 Y_t}{\partial K_t^{fdi}\partial\delta} = -B\theta\left(K_t^{fdi}\right)^{\theta-1} S^{\gamma}\frac{\partial\varepsilon_t^*}{\partial\delta}\left[1 + \frac{(1-\varepsilon_t^*)\,(1-\theta)}{\varepsilon_t^*}\right] < 0 \tag{10}$$

$$\text{if } \frac{\partial\varepsilon_t^*}{\partial\delta} > 0$$

In order to fully analyze the above equation we need to study how financial market inefficiencies affect the decision of becoming an entrepreneur. We observe that, higher the value of the parameter δ, which denotes higher inefficiencies in the financial sector, the less attractive it is to undertake entrepreneurial activity. Using $i = r + \delta$, we can rewrite equation (8) as,

$$\varepsilon_t^* = \left[\frac{(1+r+\delta)(S-b_{t-1}) + \beta A^{\frac{1}{\beta}}\left(\frac{(1-\beta)}{r}\right)^{\frac{1-\beta}{\beta}} + (1+r)b_{t-1}}{B\left(\frac{A(1-\beta)}{r}\right)^{\frac{\theta}{\beta}} S^{\gamma}}\right]^{\frac{1}{1+\theta}}$$

From this expression it follows that

$$\frac{\partial\varepsilon_t^*}{\partial\delta} > 0$$

As expected, higher financial costs reduce the number of entrepreneurs. Conversely, an improvement in the efficiency of the financial sector tends to reduce the threshold level of entrepreneurship thereby leading to an increase in the number of entrepreneurs in society.

This implies that an improvement in the efficiency of the financial sector increases the social marginal product of foreign capital. As is evident in equation (9), there are essentially two effects working here. First, an improvement in the financial sector increases the number of entrepreneurs in society. An increase in the number of entrepreneurs raises the social marginal product of FDI since the two are complements. Secondly, there is a direct effect of the number of entrepreneurs on the amount of foreign capital stock. As the number of entrepreneurs rise, the number of laborers fall. The decline in the number of laborers, implies that the stock of foreign capital will decline. Overall, higher efficiency of the local markets raises the social marginal product of foreign capital in the domestic sector.[21] The model above shows in a very simplified form, how better financial markets can lead to foreign direct investment having greater effects on output. In practice, however financial markets affect not only the financing of investment, but also the day to day to conduct of business. This channel is important but often neglected in the literature. In the appendix, we work out a more complete version of the model where such effects are also incorporated.

The overall results suggest that higher levels of FDI generates more output in the economy, and the magnitude of this positive effect is influenced by the financial market inefficiencies. In the following sections an empirical analysis based on these findings is carried out in order to understand the interaction between FDI, local capital markets and growth.

3 Data

This section describes the data used in the empirical analysis, specifically the measures of foreign direct investment, financial market development, economic growth, and several controlling variables used in the growth regressions.

There are several sources for data on foreign direct investment. An important source is the IMF publication "International Financial Statistics" (IFS) which reports the Balance of Payments statistics on FDI. The net FDI inflows, reported in the IFS, measures the net inflows of investment to acquire a lasting management interest (10 percent or more of voting

[21] Improvements in the financial markets have a positive effect on the marginal product of FDI capital for $1 - \theta + \theta\varepsilon > 0$. The assumption of $\theta < 1$ clearly helps remove any ambiguity in this condition. However, this restriction is necessary only for $\varepsilon = 0$. Further, empirically, a value of $\theta > 1$ seems highly implausible. Estimates of R&D spillovers by Coe and Helpman and Hoffmaister (1995) show that a $100 increase in the US or Japanese R&D domestic capital stock increases real GDP of developing countries by almost 25 dollars. Estimates for OECD countries show higher spillover effects.

stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments.

The gross FDI figures reflect the sum of the absolute values of inflows and outflows accounted in the balance of payments financial accounts. Our model focuses on the inflows to the economy, and those inflows that remain in the economy. Therefore we prefer using the *net* inflow measures. This is the data used by Soto (2000) as well, while Borenzstein (1998) uses inflows only from OECD countries.

It is very difficult to construct accurate and comparable measures of financial services data for a broad cross-section of countries over several decades, hence our selection of countries were initially restricted by the availability of stock market data.

Following King and Levine (1993), Levine and Zervos (1998), and Levine et al (2000a) we construct several financial market series, spanning from the stock market to the volume of lending in an economy. The stock market data closely follows Levine and Zervos (1998). Stock market liquidity is measured as the value of stock trading relative to the size of the economy, labeled as "value traded". In order to capture the relative size of the stock market we use the average value of listed domestic shares on domestic exchanges in a year as a share of the size of the economy (the GDP). This series is labeled as "capitalization". Following King and Levine (1993), we also model the liquidity in the market by using the relative share of broad money in the economy (i.e. the share of M2 in GDP). All data is from the World Development Indicators (WDI 2000), and the stock market data match the Emerging Market Database managed by Standard & Poors. These restrictiveness of the availability of stock market measures accompanied by those of FDI data allow us to use 39 countries in our analysis, with a well-representation of both high and low income countries, high and low FDI recipient countries and a wide-range of financial market development. The list of countries are reproduced in the Data Appendix.[22] The time period is also restricted by the availability of data, hence this 39 country sample covers a period of 1981-1997.

An additional measure for financial market development is the private credit extended in the economy, obtained from the World Bank. This variable measures the financial resources

[22]The coverage of both developed and developing countries is important in the analysis as is evident from the stylized fact that the share of developing countries in total FDI is around 30% in 1999, for the last two decades this share has fluctuated between 15-45%, and most FDI occurs between developed countries (see Lipsey, 1999 and WDR, 2000.) Soto and Borenzstein only use developing countries.

provided to the private sector-such as through loans, purchases of nonequity securities, and trade credits and other accounts receivable-that establish a claim for repayment. This measure closely follows the "private credit" measure used by King and Levine (1993). In order to obtain data for this new financial market indicator a second data set, composed of 41 countries, is compiled, spanning a time period 1977-1997. The majority of countries included in this sample are advanced economies, allowing a robustness check for how sensitive the empirical results are to the level of development of the economy.[23] The country list is included in the Data Appendix.

In the recent study Levine et al (2000a) construct a more elaborate "private credit" measure, which excludes the lending by the central bank and development banks. For further robustness checks a similar variable is calculated following Levine et al (2000a). This exercise alters the country sample to include dominantly developing countries.[24] This final set includes 49 countries, which spans the time period 1970-1995.

Recently in the literature, the level of financial development has been proxied by LLSV variables (see Kalemli-Ozcan et al, 1999 and Levine et al. 2000). These variables are constructed by La Porta et al. (1997, 1998) and known as LLSV variables. Our 41 country data set allows the inclusion of these LLSV variables to the analysis as well.

The major LLSV variables used in the empirical analysis include the "one share one vote" variable, "cumulative voting or proportional representation" variable, "proxy by mail" variable, as well as the "efficiency of judicial systems" measure. Specifically,"one share one vote" is equal to one if the company law or commercial code of the country requires that ordinary shares carry one vote per share, zero otherwise. Equivalently, this variable equals one when the law prohibits the existence of both multiple-voting and non-voting ordinary shares and does not allow firms to set a maximum number of votes per shareholder irrespective of the number of shares she owns, and zero otherwise.

The "cumulative voting or proportional representation" variable is equal to one if the company law of commercial code allows shareholders to cast all of their votes for one candidate standing for election to the board of directors (cumulative voting) or if the company law or commercial code allows a mechanism of proportional representation in the board by which minority interests may name a proportional number of directors to the board and zero

[23]The group of advanced economies are formed using the definition by the IMF.

[24]The third data set includes additional African and Central and South American economies. The sample was restricted by availability of FDI data.

otherwise.

The "proxy by mail" variable is equal to one if the company law or commercial code allows shareholders to mail their proxy vote to the firms, and zero otherwise.

The efficiency of judicial system is originally obtained from the Business International Corporation. The variable assesses the "efficiency and integrity of the legal environment as it affects business, particularly foreign firms". This measure is used to capture the investors' assessments of condition in the country in question.

Growth rate of output is captured by the growth of real per capita GDP, PPP adjusted, and the data is obtained from the World Bank.

The domestic investment data is proxied by the "gross domestic investment" data from the WDI (2000). Gross domestic investment consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories.

Inflation is used as a proxy for macroeconomic stability, and the data reflects the percentage changes in the GDP deflator. The data is from WDI (2000). The institutional stability and quality in the economies are proxied by using data from the International Country Risk Guide (ICRG), a monthly publication of Political Risk Services, reporting data on the risk of expropriation, level of corruption, the rule of law, and the bureaucratic quality in an economy.[25]

The government consumption data for the initial 39 countries is obtained from Barro and Lee (1994), and measures government consumption net of defense and education spending. When extending the data for robustness checks due to availability the government spending data used is changed to include military and education spending.[26]

Finally, following the economic growth literature we use assassinations, coups, revolutions and the black market premium as control variables. All data is obtained from Barro and Lee (1994) and updated from the World Bank. A detailed description of all the data is included in the Data Appendix.[27]

[25]For the 39 and 41 country samples risk of expropriation proxying for institutional quality is used and it is averaged over 1985–1995.

[26]For the 39 country sample government consumption used as initial value from 1975–1980. For the 41 country sample initial value is used from 1977.

[27]For the 39 country sample the number of assassinations, proxying for political rights, is used and averaged over 1980–1993. The same variable is used in 41 country sample averaged over 1977–1993. And it is used as averaged over 1971–1993 in the 49 country sample. Black market premium is used as initial value in 1980–1985 for the 39 country sample as is also used as an initial value in 1980 for the 41 country sample.

Two different measures are used to capture the trade openness of the economy: Sachs and Warner openness index, and the share of total trade (exports plus imports) within the total output (GDP). The trade share data is obtained from the WDI (2000). Since the share of trade in GDP is highly correlated with the share of FDI inflows in GDP we prefer using the Sachs-Warner openness index in most of our analysis.[28]

Human capital is measured as the "secondary school enrollment", obtained from WDI (2000), and is similar to the Barro and Lee (1994) series.[29] Finally, the population data is also obtained from the WDI (2000). We also use the human capital measure constructed by Dinopolous and Thompson (1999).[30] When carrying out robustness checks using Levine et al (2000a) data, for consistency purposes with what they have used we use the average years of schooling in the total population as a measure of human capital instead of secondary school enrollment.

4 Empirical Analysis

Table 2 presents descriptive statistics for the investment, growth and financial development data. There is a considerable variation in the share of FDI in GDP across countries, ranging from 0.03% in Japan to 10% in Singapore. GDP growth also shows variation, ranging from -3% for Nigeria to 7% for Korea.[31] The financial development also ranges extensively; capitalization of the stock market ranges from 140% for South Africa and 1% for Uruguay, value traded ranges from close to 0% for Uruguay to 59% for Malaysia. Finally, the liquidity measure (M2/GDP) ranges from 102% for Japan to 14% for Argentina. The private credit data , inclusive of the credit extended by the central bank and development banks ranges from 12% for Nigeria to 171% for Japan. The more elaborate private credit measure, exclusive of the central bank lending, ranges from 4% for Ghana to 123% for the United States.

[28] For the 39 country sample Sachs index for openness is averaged for 1981–1992 and for the 41 country sample it is averaged over 1977–1992.

[29] For the 39 country 1986 value of this variable is used as an initial value. For the 41 country sample initial value in 1975 is used

[30] This index yield similar results to our schooling data so we don't report them.

[31] The same range applies for the extended samples.

4.1 Growth and FDI: Financial Markets as a Channel

The purpose of our empirical analysis is to estimate the effects of FDI on economic growth, specifically to examine the financial markets channel through which FDI may be beneficial for growth, as shown in section 2. The theoretical model shows that improvements in financial markets increases output by increasing the marginal product of FDI. Though we did not formulated a full fledged dynamic model, this result suggests that one should observe transitional effects. In an influential paper, Mankiw, Romer and Weil (1992) (MRW) derived an empirical specification based on the assumption that countries were unlikely to be at their steady states and therefore transitional dynamics should be more important. We employ a specification similar to theirs. As a starting exercise, we look at the direct effect of FDI on economic growth and based on MRW, estimate the following equation

$$GROWTH_i = \beta_0 + \beta_1 INITIAL\ GDP_i + \beta_2 FDI_i + \beta_3 CONTROLS_i + \nu_i$$

We opt for cross-section regressions with 39 countries for the time period 1981–1997.[32] The regression results in 3 shows that FDI has a positive significant effect on growth (Columns (1)-(4)). Column (1) shows that FDI has a positive effect after controlling for initial income, human capital, population growth and dummies for Africa and Latin America. This finding is robust to the addition of other independent variables that are typically used in growth regressions. In column (2) we add institutional and political variables (risk of expropriation and number of assassinations, respectively) and the black market premium for foreign exchange. We also add inflation to control for macroeconomic stability and the Sachs-Warner openness index. Columns (3) and (4) repeat the same exercise for the 41 country sample. The 41 country sample includes a lot advanced economies that allows us to check the sensitivity of the results to the level of development of the countries in the sample. Additionally this sample allows us to do robustness checks since it has different financial market development indicators compared to the 39 country sample as we will see next.

Our main finding, that is the positive significance of FDI, is robust to the inclusion of other variables using both samples, whereas the significance of some of the other variables may change. Government consumption is negatively significant only in column (2). Latin

[32] This choice is mainly driven by data restrictions. See the Data section for more details. Borenzstein et al. (1998), who performed similar regressions (without the role of financial markets) state that panel regressions and cross-section regressions yield similar qualitative results.

American dummy is not robust to the inclusion of the other variables. African dummy and population growth are always negatively significant and openness index is only significant with the 41 country sample.[33] Most of these results are consistent with the growth literature with the exception of the insignificance of the institutional, political, schooling (total secondary school enrollment) variables and the inflation rate. This is probably due to our limited sample.

The regressions in Table 4 examine the role of FDI on growth through financial markets. Following the model developed in section 2, we interact FDI with financial markets and use this as a regressor. To ensure that the interaction term does not proxy for FDI or the level of development of financial markets, both of the latter variables were also included in the regression independently. Thus we run the following regression;

$$GROWTH_i = \beta_0' + \beta_1' FDI_i + \beta_2'(FDI_i * FINANCE_i) + \beta' 3 FINANCE_i + \beta_4' CONTROLS_i + \nu_i'$$

As shown in the Table 4 the interaction term turns out to be highly positive and significant in all columns. Each of the regressions use a different indicator for financial market development and a different sample: Column (1) uses capitalization, column (2) uses value traded and column (3) uses M2/GDP.[34]. The main result is that the interaction term is highly significant with or without including FDI and financial markets separately as regressors.[35] Financial market indicators turn out to be insignificant and FDI turns out to be negative and insignificant in general. However only in column (1) FDI is negatively significant. This can be due to the fact that with no financial markets FDI does not have any affect on growth. It is also possible that with no financial markets FDI is not channeled efficiently and has a negative effect on growth.[36] In fact, the results suggest that there is a threshold level of the development of financial markets below which FDI will not have any beneficial effects for growth. Calculations based on our sample for the year 1997 reveals that only 9 out of 39 countries were above the threshold level for the measure of "capitalization". Capitalization

[33]We also used EU, Asia, East Asia, South East Asia and West Europe dummies respectively; which turn out to be insignificant and did not affect the results.

[34]See the data section for detailed definitions.

[35]The t-stat on the interaction term is around 2.5 on average for the three financial market development indicators in the regressions that don't include FDI/GDP as a separate regressor.

[36]Similarly, Borenzstein et al. find FDI to have a negative, and in some cases significant effect, when they interact FDI with human capital.

variable measures size but not necessarily healthy financial markets. For the value traded variable 16 countries are above the threshold and for the M2/GDP variable 15 countries are above. [37] The significance of the interaction term is robust to the inclusion of the other determinants of growth. Results are similar to table 3 with a higher significance for openness.

For a robustness check and inclusion of further financial development measures we repeat the above exercise for the second sample of 41 and third sample of 49 countries. The results, reported in column (4), (5) and (6), show that the importance of financial markets in allowing the positive spillovers of FDI to be realized remains unchanged. Similar to the results reported in column (1), these results suggest that there is a threshold of private credit for FDI to have positive effects on the recipient economy.[38] We also controlled for additional variables in the growth regression; human capital, government consumption and regional dummies. The human capital variable used in column (4) and (5) is measured as the total secondary school enrollment as in the first 3 columns, whereas in column (6) measured as the average years of schooling in the total population. The government size is measured as the real general government consumption as a share of real GDP.[39]

The strong positive correlation between the domestic investment ratio and the growth rate of an economy is one of the few consistent results to have emerged from the multitude of cross country growth regressions that have appeared in the past decade. One could argue that the reason FDI appeared significant in the above analysis is because the domestic investment ratio was not included. The model in Section 2 in fact suggests that FDI and financial markets interact to promote domestic investment also by increasing the number of entrepreneurs in society. Therefore, for further robustness checks we add domestic investment to the list of independent variables, and the results are reported in Table 5.

With the inclusion of domestic investment FDI becomes insignificant in column (1) and (2) for the 39 country and 41 country samples respectively. This suggests that FDI might work its effect on growth through domestic investment. When we include the interaction with financial markets for the growth regressions in columns (3)-(5) the results improve and the interaction term turns out to be significant. This holds for different financial market indicators and for different samples. A final issue of robustness is whether or not the importance of

[37] The threshold levels are 0.89, 0.28 and 0.55 respectively for all the three variables. We find these by taking a total derivative of the OLS regression equation.

[38] This threshold effect is only significant in columns (1) and (6) though.

[39] Both measures follow Levine et al (2000a) for the third sample for consistency purposes.

human capital prevails in the above analysis. Column (6) reports the results for the regression testing the significance of the the interaction term of human capital and FDI, finding level of schooling being significant alone, but not playing a significant role in allowing positive effects of FDI.

4.2 Domestic Investment and FDI

Table 5 raises the question of whether or not FDI affects growth through domestic investment. Table 6 shows the supporting evidence, that FDI does infact significantly increase domestic investment. Results through columns (1)-(4) show that FDI increases total investment more than one for one. Since the data on domestic investment includes foreign owned investment as well, a coefficient exceeding 1 actually shows that FDI does have an impact on domestic investment, while a coefficient of 1 shows that FDI has no impact on domestic investment.[40] All regressions reported in table 6 find the coefficients on FDI to range from 1.12 to 1.76 according to the different sets of control variables. Similar results are reported for the second sample of countries, where the coefficients on FDI range from 1.01 to 1.27 depending on the different sets of control variables.

4.3 Endogeneity of FDI

Table 7 takes a different approach in examining the interaction between financial markets and FDI and the effect of this interaction on growth. The mixed results in the literature about the effects of FDI on growth may be due to the potential endogeneity of FDI. If developed financial markets is a positive attribute that attracts FDI then causality may run from developed financial markets to FDI and then to growth. Thus we use financial markets as instruments for FDI in a 2SLS-IV regression in column (2). In order to avoid the argument about the endogeneity of these instruments we use the initial values. Specifically we use the interaction between the initial values of capitalization and value traded variables as instruments for FDI. Columns (3)-(4) performs IV once again as in column (2), adding lagged FDI and real exchange rates as instruments, which have been found to be significantly correlated with FDI in the literature. Finally column (5) only uses lagged FDI and exchange rates leaving out the financial variables. The results are very close to the OLS results in

[40] The coefficient here reflects the effect on investment and not output. In the theoretical model the elasticity of output with respect to spillover was assumed to be less than one.

column (1) and show clear significance at 5% level. The estimates for the FDI coefficient are always positive and in the same range as the OLS estimates.

As a result the instrumental variables regression provide evidence of a causal link from FDI to economic growth. Now we turn to the second endogeneity question that is about the financial markets, which is the underlying mechanism of this causal link from FDI to growth.

4.4 Endogeneity of Financial Market Development

There may be a potential endogeneity problem regarding the financial market indicators. This is particularly important since we are also using the average values of these variables in the interaction regressions of table 4, which can be subject to an endogeneity bias. Thus we will use instruments which facilitate financial market development and not subject to reverse causality, such as shareholder rights, creditor rights, enforcement of legal-political rights, etc. The rationale for using such instruments is explained in La Porta et al (1997). When the legal system provides protection for investors, they will be more inclined to buy securities issued by firms, directly or via intermediaries. Similarly, financial intermediaries will be more willing to lend and invest beyond the close circle of client firms. La Porta et al. argue that shareholder rights vary systematically across countries, and consider four main legal traditions where these variables based upon: Common Law, French, German, and Scandinavian tradition, with the most extensive shareholder rights in Common Law countries. In two recent studies these variables are used to instrument for financial market development. Kalemli-Ozcan et al. (1999) use LLSV variables as instruments for their capital market integration measure in an IV regression framework and thus provide solid empirical evidence for an important mechanism through which a developed and reliable financial system, backed by a legal environment that protects investor rights, enhances specialization. This will promote growth given the survey of the theoretical and empirical studies in our introduction. Levine et al. (2000a,b) also use LLSV variables together with legal origin dummies to instrument for their liquidity, banking and stock market indicator variables again to show the causal link between financial development and growth.

Table 8 reports the results of the 2SLS-IV regressions using LLSV variables as instruments for financial markets. The results in column (2)-(4) uses different variables as instruments. Column (2) uses judicial efficiency and cumulative voting. Column (3) also adds proxy by mail. Column (4) uses proxy by mail together with one share one vote instead of cumulative

voting. All these columns show that interaction term is still positive and significant and results are very similar to the OLS results in column (1).

Finally column (5) controls for both endogeneity problems by instrumenting FDI with lagged FDI and exchange rates and instrumenting financial markets with LLSV variables used in column (2). Our results suggest the following mechanism. FDI promotes growth through financial markets. Basically the interaction of FDI and financial markets causes more growth.

5 Conclusion

Since the debt crisis in the 1980's and the recent turmoil in emerging markets in the late 1980s, developing countries have changed their attitude towards FDI as it is believed that FDI can contribute to the development efforts of a country. In general, if a firm decides to invest in another country it is because of lower costs and higher efficiency. But the host country can benefit not only from the better use of its resources, but also from the introduction of new processes to the domestic market, learning-by-observing, networks, training of the labor force, and other spillovers and externalities. Because of the "growth-development" benefits FDI seems to convey, different countries and regions have pursued active policies to attract FDI. Most countries, including both developed and emerging nations have established investment agencies with the objective to attract foreign companies. Policies include both fiscal and financial incentives to attract FDI as well as others that seek to improve the local regulatory environment and the "cost of doing business" (See UNCTAD 1999).

Though policies such as fiscal and financial incentives can be very effective in attracting foreign investment, local conditions can limit the potential benefits FDI can convey to the host country not generating benefits that go beyond the "capital" FDI brings and the wages it generates. In this paper, in particular, we focused on the role of local financial markets, and the link between foreign direct investment and growth. We believe that the development of local financial markets in particular can adversely limit the economy's ability of taking advantage of such potential FDI benefits.

The empirical evidence suggests that FDI plays an important role in contributing to economic growth. Other researchers have also examined the effect of FDI on growth. They have not however provided empirical evidence that shows the specific mechanism between financial markets and FDI that contributes to economic growth. The level of development of local financial markets is crucial for the positive effects to be realized and to the best

of our knowledge this has not been shown before. We also provide evidence that that the link between FDI and growth is causal and FDI promotes growth through financial markets. The result of this paper suggests that countries should weigh the cost of policies aimed at attracting FDI versus those that seek to improve local conditions. These two set of policies need not be incompatible, better local conditions not only attract foreign companies but also they can maximize the benefits of foreign investments.

Technical Appendix

In this section we expand the model worked out in the text to incorporate the effects of financial sector efficiency into production. The foreign sector's production function can now be rewritten as,

$$Y^{FDI} = A(\delta)L^{\beta}\left(K^{fdi}\right)^{1-\beta} \qquad \text{(A.1)}$$

Following, Roubini and Sala-i-Martin (1992), $A(\delta)$ is financial sector efficiency parameter, where δ reflects the inefficiencies in the financial sector. We can think that the foreign firm pays wages, local inputs and other local costs as well as receives payments through the local bank system. Thus, the more automatic teller machines, the better and faster the service at the branches; and in general the more financially developed the economy the higher the productivity of the FDI sector. Consequently, we assume that $A'(\delta) < 0, A''(\delta) > 0$.

Using

$$L = \int_0^{\varepsilon^*} \varepsilon^i di = \varepsilon^* \qquad \text{(A.2)}$$

$$Y^{FDI} = A(\delta)\left(\varepsilon^*\right)^{\beta}\left(K^{fdi}\right)^{1-\beta} \qquad \text{(A.3)}$$

The amount of foreign capital in the country is given by:

$$K^{fdi} = \left(\frac{(1-\beta)A(\delta)\left(\varepsilon^*\right)^{\beta}}{r}\right)^{\frac{1}{\beta}} \qquad \text{(A.4)}$$

The amount of foreign labor used in the FDI sector is given by:

$$\left(\varepsilon^*\right) = \left(\frac{\beta A(\delta)}{w}\right)^{\frac{1}{1-\beta}} K^{fdi} \qquad \text{(A.5)}$$

The production function in the entrepreneurial sector is given by:

$$Y^i = \varepsilon_i B(\delta)\left(K^{fdi}\right)^{\theta} S^{\gamma} \qquad \text{(A.6)}$$

$B(\delta)$, as in the FDI sector, is a financial sector efficiency parameter. We assume that $B'(\delta) < 0, B''(\delta) > 0$.

Static Equilibrium

An agent is indifferent between working for the foreign firm or starting its own firm if

$$w + (1+r)b_0 = Y^i - (1+i)(S - b_0) \qquad \text{(A.7)}$$

Substituting the output Y^i, equation (A.6), and the wage, equation (A.5), we obtain:

$$\beta A(\delta)\left(\varepsilon^*\right)^{\beta-1}\left(K^{fdi}\right)^{1-\beta} + (1+r)b_0 = \varepsilon_i B(\delta)\left(K^{fdi}\right)^{\theta} S^{\gamma} - (1+i)(S - b_0) \qquad \text{(A.8)}$$

With an uniform distribution, we obtain the following expression for ε_i

$$\varepsilon_i = \frac{(1+i)(S-b_0) + \beta A(\delta)\left(\varepsilon^*\right)^{\beta-1}\left(K^{fdi}\right)^{1-\beta} + (1+r)b_0}{B(\delta)\left(K^{fdi}\right)^{\theta} S^{\gamma}} \qquad \text{(A.9)}$$

For the individual who is indifferent between sectors,

$$\varepsilon_i = \varepsilon_i^* = c \qquad \text{(A.10)}$$

$$\varepsilon^* = f(r, \delta, b_0, \beta, \theta, \gamma, S) \qquad \text{(A.11)}$$

Substituting the equation for wages and FDI capital:

$$\varepsilon^* = \frac{(1+i)(S-b_0) + \beta A(\delta)\left(\varepsilon^*\right)^{\beta-1}\left(\frac{(1-\beta)A(\delta)(\varepsilon^*)^{\beta}}{r}\right)^{\frac{1-\beta}{\beta}} + (1+r)b_0}{B(\delta)\left(\frac{(1-\beta)A(\delta)(\varepsilon^*)^{\beta}}{r}\right)^{\frac{\theta}{\beta}} S^{\gamma}} \qquad \text{(A.12)}$$

Rearranging

$$\varepsilon^* = \left[\frac{(1+i)(S-b_0) + \beta A(\delta)^{\frac{1}{\beta}}\left(\frac{(1-\beta)}{r}\right)^{\frac{1-\beta}{\beta}} + (1+r)b_0}{B(\delta)\left(\frac{(1-\beta)A(\delta)}{r}\right)^{\frac{\theta}{\beta}} S^{\gamma}}\right]^{\frac{1}{1+\theta}} \qquad \text{(A.13)}$$

Comparative Statics

The model allows us to study several aspects of an FDI recipient economy. The ultimate objective is to show how FDI will impact economic output and how the magnitude of this impact depends on the local financial market conditions. To find this results, we first need to solve for how the efficiency of the financial markets affect the critical level of entrepreneurship and the level of foreign capital (FDI). Both channels contribute to the full effect on output. Under certain parameter conditions, better financial markets allow for increased output in the entrepreneur sector as well as more FDI, and more importantly, higher marginal productivity of capital and hence more production in the foreign-production sector.

The first link we are interested in is the effect of changes in the efficiency of the financial sector on the allocation of individuals across sectors. In other words, we are interested in the sign of $\frac{\partial \varepsilon}{\partial \delta}$. As mentioned above, this will allow us to find the full effects of local financial markets on output in the economy. Rewriting (A.11), we define F as

$$F(r, \delta, b_0, \beta, \theta, \gamma, S) = \varepsilon^* - f(r, \delta, S, b_0, \beta, \theta, \gamma) = 0 \qquad \text{(A.14)}$$

$$F = (\varepsilon^*)^{\theta+1} B(\delta) \left(\frac{(1-\beta)A(\delta)}{r}\right)^{\frac{\theta}{\beta}} S^{\gamma} - \beta A(\delta)^{\frac{1}{\beta}} \left(\frac{1-\beta}{r}\right)^{\frac{1-\beta}{\beta}} - (1+r+\delta)(S-b_0) - (1+r)b_0 \qquad \text{(A.15)}$$

We can use the implicit function to find the effect of changes in the efficiency of the financial sector in the allocation of individuals across sectors $\frac{\partial \varepsilon}{\partial \delta}$:

$$\frac{\partial \varepsilon}{\partial \delta}(r, \delta, b_0, \beta, \theta, \gamma, S) = -\frac{\frac{\partial F(r,\delta,b_0,\beta,\theta,\gamma,S)}{\partial \varepsilon^*}}{\frac{\partial F(r,\delta,b_0,\beta,\theta,\gamma,S)}{\partial \delta}} \qquad \text{(A.16)}$$

$$\frac{\partial \varepsilon}{\partial \delta} = \frac{(S-b_0) - B(\delta)\,(\varepsilon^*)^{\theta+1} \left(\frac{(1-\beta)A(\delta)}{r}\right)^{\frac{\theta}{\beta}} S^{\gamma} \left[\frac{B'(\delta)}{B(\delta)} + \left(\frac{\theta}{\beta}\right) \frac{A'(\delta)}{A(\delta)}\right] + (1-\beta)\, A(\delta)^{\frac{1}{\beta}} \frac{A'(\delta)}{A(\delta)} \left(\frac{(1-\beta)}{r}\right)^{\frac{1-\beta}{\beta}}}{B(\delta)\,(\varepsilon^*)^{\theta+1} \left(\frac{(1-\beta)A(\delta)}{r}\right)^{\frac{\theta}{\beta}} S^{\gamma} \frac{(\theta+1)}{\varepsilon^*}}$$

(A.17)

In the numerator, the term $(S - b_0)$ is greater than zero by assumption, and it captures the marginal increase in the cost of borrowing due to higher intermediation costs. As the cost of intermediation increases, fewer agents become entrepreneurs and more people work for the foreign firm.

The term $B(\delta)\left(\varepsilon^{*}\right)^{\theta+1}\left(\frac{(1-\beta)A(\delta)}{r}\right)^{\frac{\theta}{\beta}} S^{\gamma}\ \frac{B'(\delta)}{B(\delta)}$ reflects how higher financial costs affect the entrepreneurial sector production function. It is negative by assumption, $B'(\delta) < 0$. If higher intermediary costs affect the entrepreneurial sector, less people become entrepreneurs and more agents go to the FDI sector.

The term $B(\delta)\left(\varepsilon^{*}\right)^{\theta+1}\left(\frac{(1-\beta)A(\delta)}{r}\right)^{\frac{\theta}{\beta}} S^{\gamma}\left(\frac{\theta}{\beta}\right)\frac{A'(\delta)}{A(\delta)}$ is also negative, $A'(\delta) < 0$. Higher financial costs negatively affect the FDI sector, thus lowering the level of foreign capital and thus the externalities in favor of the entrepreneurial sector. Given this effect, fewer agents become entrepreneurs.

The last term $(1-\beta)\,A(\delta)^{\frac{1}{\beta}}\frac{A'(\delta)}{A(\delta)}\left(\frac{(1-\beta)}{r}\right)^{\frac{1-\beta}{\beta}}$ reflects how higher financial costs affect the FDI sector, and it is negative by assumption. If it becomes more costly to produce in the FDI sector, FDI and wages fall and therefore, the entrepreneurial sector becomes more attractive.

The denominator in equation (A.16) reflects the net effect of changes in ε^{*} in the entrepreneurial sector and it is positive.

To summarize, as the inefficiencies in the financial sector increase, most likely workers would go to the FDI sector. This is true unless the negative effect of the higher financial inefficiencies in the FDI sector outweighs the higher cost of borrowing, the lower productivity in the entrepreneurial sector due to higher intermediary costs and the lower productivity in the entrepreneurial sector due to lower FDI and thus lower FDI externalities.

$$\frac{\partial\varepsilon}{\partial\delta} = \frac{\begin{array}{cccc} \uparrow\delta\text{: cost to} & \uparrow\delta\text{: entrep. sector} & \uparrow\delta\text{: FDI less eff.} & \uparrow\delta\text{: FDI less} \\ \text{start a firm}\uparrow & \text{less productive} & \downarrow FDI\text{ , less extern.} & \text{efficient} \\ \uparrow\varepsilon:\ \uparrow\text{workers} & \uparrow\varepsilon\text{: }\uparrow\text{ workers} & \uparrow\varepsilon:\uparrow\text{ workers} & \downarrow\varepsilon\text{: }\downarrow\text{ workers} \\ \text{to FDI sector} & \text{to FDI firm} & \text{to FDI sector} & \text{to FDI firm} \end{array}}{\uparrow\varepsilon\ \text{entrep sector}}$$

The effect of higher intermediary costs on FDI, $\frac{\partial K^{fdi}}{\partial\delta}$ is:

$$\frac{\partial K^{fdi}(r,\delta,b_0,\beta,\theta,\gamma,S)}{\partial\delta} = \left(\frac{(1-\beta)\,A(\delta)}{r}\right)^{\frac{1}{\beta}}\left[\frac{\varepsilon^{*}}{\beta}\frac{A'(\delta)}{A(\delta)} + \frac{\partial\varepsilon^{*}}{\partial\delta}\right] \qquad \text{(A.18)}$$

The first term is negative, since we assumed $A'(\delta) < 0$. The value of the second term depends on $\frac{\partial\varepsilon^{*}}{\partial\delta}$. Thus, the value of $\frac{\partial K^{fdi}}{\partial\delta}$ depends on the sum of a negative effect due to higher intermediary costs versus a positive effect due to a higher number of workers. This result, depends of course, on the assumption that FDI is attracted by cost of capital considerations.

We are also interested in how changes in the intermediary costs affect the final output. Total output is the sum of the output in each sector:

$$Y = Y^{FDI} + \int_{\varepsilon^*}^{1} Y^i d\varepsilon \qquad \text{(A.19)}$$

Substituting (A.1) and (A.6) into (A.19) and using (A.2):

$$Y(r,\delta,b_0,\beta,\theta,\gamma,S) = A(\delta)\left(\varepsilon^*\right)^{\beta}\left(K^{fdi}\right)^{1-\beta} + \left(1-\varepsilon^*\right)B(\delta)\left(K^{fdi}\right)^{\theta}S^{\gamma} \qquad \text{(A.20)}$$

The effect of higher intermediary costs on the output level , $\frac{\partial Y(r,\delta,b_0,\beta,\theta,\gamma,S)}{\partial\delta}$ is given by

$$\frac{\partial Y(r,\delta,b_0,\beta,\theta,\gamma,S)}{\partial\delta} = g(r,\delta,b_0,\beta,\theta,\gamma,S) \qquad \text{(A.21)}$$

$$\begin{aligned}\frac{\partial Y}{\partial\delta} = g(.) = &\left[A'(\delta)\left(\varepsilon^*\right)^{\beta}\left(K^{fdi}\right)^{1-\beta} + \left(1-\varepsilon^*\right)B'(\delta)\left(K^{fdi}\right)^{\theta}S^{\gamma}\right] \\ &+ \left[(1-\beta)A(\delta)\left(\varepsilon^*\right)^{\beta}\left(K^{fdi}\right)^{-\beta} + \theta\left(1-\varepsilon^*\right)B(\delta)\left(K^{fdi}\right)^{\theta-1}S^{\gamma}\right]\frac{\partial K^{fdi}}{\partial\delta} \\ &+ \left[\beta A(\delta)\left(\varepsilon^*\right)^{\beta-1}\left(K^{fdi}\right)^{1-\beta} - B(\delta)\left(K^{fdi}\right)^{\theta}S^{\gamma}\right]\frac{\partial\varepsilon}{\partial\delta}\end{aligned} \qquad \text{(A.22)}$$

The first squared bracket term is the loss in production due to the higher inefficiencies in the financial sector, which has a negative sign. The second squared bracket term is positive and multiplies $\frac{\partial K^{fdi}}{\partial\delta}$. The value of the third term depends on the effect of higher intermediation cost on the allocation of workers, $\frac{\partial\varepsilon}{\partial\delta}$, and the term on the third bracket.

$$\beta A(\delta)\left(\varepsilon^*\right)^{\beta-1}\left(K^{fdi}\right)^{1-\beta} - B(\delta)\left(K^{fdi}\right)^{\theta}S^{\gamma} \qquad \text{(A.23)}$$

which is negative if $\beta A(\delta)\left(\varepsilon^*\right)^{\beta-1}\left(K^{fdi}\right)^{1-\beta} < B(\delta)\left(K^{fdi}\right)^{\theta}S^{\gamma}$. Using (A.1),

$$Y^{FDI} < \varepsilon^* B(\delta)\left(K^{fdi}\right)^{\theta}S^{\gamma} \qquad \text{(A.24)}$$

Thus, if the production in the "indifferent agent" is higher than in the entrepreneurial sector, then the value of (A.24) is negative.

All of these steps, that show financial markets play a role in determination of output, are carried out in order to study the effects of FDI on output. In addition to this our main

objective is to see how this effect of FDI on output will be impacted from the development of local financial markets. Technically this means we need to show how the marginal product of foreign capital (FDI) is affected from the financial market inefficiency.

The marginal product of FDI capital is given by:

$$\frac{\partial Y}{\partial K} \equiv MPKFDI = (1-\beta)A(\delta)\left(\varepsilon^*\right)^{\beta}\left(K^{fdi}\right)^{-\beta} + \theta\left(1-\varepsilon^*\right)B(\delta)\left(K^{fdi}\right)^{\theta-1}S^{\gamma} \qquad \text{(A.25)}$$

This equation shows both effects of foreign capital on output. The first effect is the direct effect on production, which is the first term. The second effect, which is captured by the second term, is the spillover effect of foreign capital on entrepreneurial sector. Both terms are positive, which says FDI has a positive overall effect on output.

For our main objective as mentioned above we need to show the effect of financial development on marginal productivity of FDI. The effect of higher intermediation costs on the marginal product of FDI capital is given by;

$$\frac{\partial MPKFDI}{\partial \delta} = h(r,\delta,b_0,\beta,\theta,\gamma,S) \qquad \text{(A.26)}$$

$$\frac{(MPKFDI)}{\partial \delta} = (1-\beta)A'(\delta)\left(\varepsilon^*\right)^{\beta}\left(K^{fdi}\right)^{-\beta}$$

$$+\beta(1-\beta)A(\delta)\left(\varepsilon^*\right)^{\beta-1}\left(K^{fdi}\right)^{-\beta}\frac{\partial \varepsilon}{\partial \delta} - \beta(1-B)A(\delta)\left(\varepsilon^*\right)^{-\beta}\left(K^{fdi}\right)^{-\beta-1}\frac{\partial K}{\partial \delta}$$

$$+\theta\left(1-\varepsilon^*\right)B'(\delta)\left(K^{fdi}\right)^{\theta-1}S^{\gamma}$$

$$-\theta B(\delta)\left(K^{fdi}\right)^{\theta-1}S^{\gamma}\frac{\partial \varepsilon}{\partial \delta} + \theta(\theta-1)\left(1-\varepsilon^*\right)B(\delta)\left(K^{fdi}\right)^{\theta-2}S^{\gamma}\frac{\partial K}{\partial \delta}$$

(A.27)

Rearranging (A.27)

$$\frac{(MPKFDI)}{\partial \delta} = [(1-\beta)A'(\delta)\left(\varepsilon^*\right)^{\beta}\left(K^{fdi}\right)^{-\beta} + \theta\left(1-\varepsilon^*\right)B'(\delta)\left(K^{fdi}\right)^{\theta-1}S^{\gamma}]$$

$$+\left(\beta(1-\beta)A(\delta)\left(\varepsilon^*\right)^{\beta-1}\left(K^{fdi}\right)^{-\beta} - \theta B(\delta)\left(K^{fdi}\right)^{\theta-1}S^{\gamma}\right)\frac{\partial \varepsilon}{\partial \delta}$$

$$+\left(-\beta(1-\beta)A(\delta)\left(\varepsilon^{*}\right)^{-\beta}\left(K^{fdi}\right)^{-\beta-1}+\theta(\theta-1)\left(1-\varepsilon^{*}\right)B(\delta)\left(K^{fdi}\right)^{\theta-2}S^{\gamma}\right)\frac{\partial K}{\partial\delta} \qquad (A.28)$$

The first-squared term is negative since we assumed that $A'(\delta) < 0, B'(\delta) < 0$.The sign of the second term depends on parameter values and the value of $\frac{\partial\varepsilon}{\partial\delta}$. Finally, the third term inside the brackets is negative.

Numerical Analysis

Since equations $\frac{\partial\varepsilon}{\partial\delta}, \frac{\partial K^{fdi}}{\partial\delta}, \frac{\partial Y}{\partial\delta}, \frac{(MPKFDI)}{\partial\delta}$ do not have a simple close form solution, we plotted equations (A.17), (A.18), (A.22) and (A.27) against different parameter values. The objective of this section is not to completely characterize the domain of these equations, but to show that for reasonable values, $\frac{\partial\varepsilon}{\partial\delta} > 0, \frac{\partial K^{fdi}}{\partial\delta} < 0$, $\frac{\partial Y}{\partial\delta} < 0$ and $\frac{(MPKFDI)}{\partial\delta} < 0$.

Figure 2, shows simulations for the following benchmark case: $S = 1; \theta = 0.3; \beta = 0.6; r = 0.01; \gamma = 1$. For the financial sector efficiency functions, $A(\delta), B(\delta)$ we assumed $A(\delta) = \frac{a}{\delta}, a = 1; B(\delta) = \frac{b}{\delta}, b = 1$. Figure 2.1a plots the change in the allocation of workers in the foreign sector due to changes in the intermediation cost ($\frac{\partial\varepsilon}{\partial\delta}$, labeled de/dd in the graph) against different values of θ, the externality parameter. For the benchmark parameter values, $\frac{\partial\varepsilon}{\partial\delta}$ is always positive. Figure 2.1a plots as well the change in the marginal cost of foreign capital due to changes in the intermediation cost ($\frac{MPKFDI}{\partial\delta}$, labeled dmpk/dd in the graph) against θ. For the benchmark parameter values, $\frac{\partial\varepsilon}{\partial\delta}$ is always negative. Figure 2.1b plots the change in total output due to changes in the intermediation cost ($\frac{\partial Y}{\partial\delta}$, labeled dY/dd in the graph), which is always negative for different values of θ. Finally, the change in the level of FDI capital due to changes in the intermediation cost ($\frac{\partial K^{fdi}}{\partial\delta}$, labeled dK/dd in the graph) is always negative for different values of θ, as seen in Figure 2.1b

Figure 2.2a plots the change in the allocation of workers in the foreign sector due to changes in the intermediation cost ($\frac{\partial\varepsilon}{\partial\delta}$) against different values of b_0, the initial asset level. For the benchmark parameter values, $\frac{\partial\varepsilon}{\partial\delta}$ is always positive. The same figure shows that $\frac{\partial K^{fdi}}{\partial\delta}$ is always negative. Figure 2.2b shows that both $\frac{\partial Y}{\partial\delta}$ and $\frac{MPKFDI}{\partial\delta}$ vary inversely with changes in the initial asset level.

Figures 2.3a and 2.3b plot $\frac{\partial\varepsilon}{\partial\delta}, \frac{\partial K^{fdi}}{\partial\delta}, \frac{\partial Y}{\partial\delta}$ and $\frac{MPKFDI}{\partial\delta}$ against different values of b,the coefficient in the "financial efficiency" parameter in the foreign production function. For the benchmark parameter values, $\frac{\partial\varepsilon}{\partial\delta}$ is always positive, and all $\frac{\partial K^{fdi}}{\partial\delta}, \frac{\partial Y}{\partial\delta}, \frac{MPKFDI}{\partial\delta}$ are always negative.

Finally, figures 2.4a and 2.4b plot the different equations against different values of a, the coefficient in the "financial efficiency" parameter in the entrepreneurial sector. For the benchmark parameter values, $\frac{\partial \varepsilon}{\partial \delta}$ is always positive, and all $\frac{\partial K^{fdi}}{\partial \delta}$, $\frac{\partial Y}{\partial \delta}$, $\frac{MPKFDI}{\partial \delta}$ again always negative.

Figure 3, shows a different simulation for the following benchmark case: $S = 1; \theta = 0.1; \beta = 0.67, a = 1; b = 3; r = 0.1; \gamma = 1$. We plotted $\frac{\partial \varepsilon}{\partial \delta}$, $\frac{\partial K^{fdi}}{\partial \delta}$, $\frac{\partial Y}{\partial \delta}$, $\frac{MPKFDI}{\partial \delta}$ against variations in θ, b_0, a and b. We obtained the desired signs for all equations. In general, the value of $\frac{\partial \varepsilon}{\partial \delta}$, $\frac{\partial K^{fdi}}{\partial \delta}$, $\frac{\partial Y}{\partial \delta}$ and $\frac{(MPKFDI)}{\partial \delta}$ depend on the parameter values chosen. Therefore, we feel that an econometric analysis is essential to understand the interaction between FDI, local capital markets and growth.

Data Appendix

A2.1 Countries in the Samples

1. Sample of 39 countries, ranging from developing to advanced countries.

2. Sample of 41 countries, dominated by advanced countries (as defined by the IMF).

3. Sample of 49 countries, dominated by developing countries (main data source Levine et al., 2000).

List Algeria (3), Argentina (1,2,3), Australia (1,2,3), Austria (1,2,3), Bangladesh (1), Belgium (1,2), Bolivia (3), Brazil (1,2,3), Canada (1,2,3), Chile (1,2,3), Colombia (1), Costa Rica (3), Cote d'Ivoire (1), Denmark (1), Dominican Republic (3), Ecuador (2,3), Egypt (1,2,3), El Salvador (3), Finland (2), France (1,2), Gambia (3), Ghana (3), Greece (1,2,3), Guatemala (3), Guyana (3), Haiti (3), Honduras (3), India (1,2,3),Indonesia (1,2), Ireland (2), Israel (1,2,3), Italy (1,2,3), Jamaica (3), Japan (1,2), Jordan (1,2), Kenya (2,3), Korea (1,2), Malaysia (1,2,3), Mauritius (3), Mexico (1,2,3), Nepal (3), Netherlands (1,2,3), New Zealand (2), Niger (3), Nigeria (1,2,3), Norway (1,2), Pakistan (2,3), Panama (3), Paraguay (3), Peru (2,3), Philippines (1,2,3), Portugal (1,2), Rwanda (3), Senegal (3), Sierra Leone (3), Singapore (1,2), South Africa (1), Spain (1,2), Sri Lanka (2,3), Sudan (3), Sweden (1,2,3), Thailand (1,2,3), Togo (3), Trinidad Tobago (3), Turkey (1,2), United Kingdom (1,2,3), United States (1,2,3), Uruguay (1,2,3), Venezuela (1,2,3), Zimbabwe (1).

A2.2 Data Sources and Descriptions

Foreign Direct Investment: The net FDI inflows measures the net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments. *Source: IMF "International Financial Statistics".*

Output levels and growth: Output level and growth data is the growth of real per capita GDP, PPP adjusted. *Source: World Bank.*

Value traded: Value of stock trading relative to the size of the economy *Source: World Bank and Emerging Market Database.*

Capitalization Captures the size of the stock market, measures the average value of listed domestic shares on domestic exchanges in a year as a share of the size of the economy (the GDP).*Source: World Bank and Emerging Market Database.*

Liquidity: Money and quasi money as a share of GDP (M2/GDP).*Source: World Bank.*

Private credit I: The financial resources provided to the private sector-such as loans, purchases of nonequity securities, and trade credits and other accounts receivable-that establish a claim for repayment. Used in the second sample. *Source: WDI.*

Private credit II: This variable measures the financial intermediary credits to the private sector relative to GDP, and it includes only credits issued by deposit money banks and other financial intermediaries, excluding credit to the public sector and cross claims of one group of intermediaries on another. Used in the third sample. *Source: Levine et al (2000a) calculations using IFS data.*

One share one vote: is equal to one if the company law or commercial code of the country requires that ordinary shares carry one vote per share, zero otherwise. Equivalently, this variable equals one when the law prohibits the existence of both multiple-voting and non-voting ordinary shares and does not allow firms to set a maximum number of votes per shareholder irrespective of the number of shares she owns, and zero otherwise. *Source: Original source is the Company Law or Commercial Code, secondary source is LLSV.*

Cumulative voting or proportional representation: is equal to one if the company law of commercial code allows shareholders to cast all of their votes for one candidate standing for election to the board of directors (cumulative voting) or if the company law or commercial code allows a mechanism of proportional representation in the board by which minority interests may name a proportional number of directors to the board and zero otherwise. *Source: Original source is the Company Law or Commercial Code, secondary source is LLSV.*

Domestic Investment: "Gross domestic investment" measuring the outlays on additions to the fixed assets of the economy plus net changes in the level of inventories.*Source: WDI.*

Inflation: Percentage changes in the GDP deflator.*Source: WDI.*

Government Consumption: In the first two datasets the government consumption is measured as the government consumption net of defense and education spending, whereas the third data-set uses a measure inclusive of the military and education spending (due to data availability). *Sources: World Bank, and Barro and Lee (1994).*

Trade Openness: Sachs and Warner dummy variable, as well as exports plus imports as a share of GDP is used. *Sources: Sachs and Warner (199?) and World Bank respectively.*

Human Capital: In the first and second data set human capital is measured as "secondary school enrollment" as well as an index constructed by Dinopolous and Thompson (1999) *Sources: WDI, Barro and Lee (1994), and Dinopolous and Thompson (1999) respectively.* The third data set uses human capital measured as the average years of secondary schooling

in total population. *Source: Barro and Lee (1994).*

Efficiency of judicial system: Assesses the "efficiency and integrity of the legal environment as it affects business, particularly foreign firms". *Source: Original source is the Business International Services, secondary source is LLSV.*

Corruption: Corruption within the political system, i.e. financial corruption in the form of demands for special payments and bribes connected with import and export licenses, exchange controls, tax assessments or loans. It also captures corruption in the form of excessive patronage, job reservations, 'favor-for-favors', secret party funding, suspiciously close ties between politics and business; all of which could lead to inefficient control of the economy, and increased incentives for black market development. *Source: ICRG.*

The rule of law: The law sub-components assess the strength and impartiality of the legal system while the 'order' sub-component assesses the observance of law in the system.*Source: ICRG.*

Bureaucratic quality: The institutional strength of the economy. High levels of quality imply that the bureaucracy has the strength and expertise to govern without drastic changes in policy, or interruption to public services.*Source: ICRG.*

Risk of expropriation: The probability that the government may expropriate private property.*Source: ICRG.*

Assassinations: The number of any politically motivated murder or attempted murder of a high government official or politician. *Source: World Bank.*

Coups: The number of extra-constitutional or forced changes in the tip government elite and/or its effective control of the nation's power structure in a given year. The term "coup" includes, but is not exhausted by, the term "successful revolution". Unsuccessful coups are not counted. *Source: World Bank.*

Revolutions: The number of any illegal or forced change in the top governmental elite, any attempt at such a change, or any successful or unsuccessful armed rebellion whose aim is independence from the central government.*Source: World Bank.*

Black market premium: It is calculated as the premium in the parallel exchange market relative to the official market (i.e. the formula is (parallel exchange rate/official exchange rate-1)*100). The values for industrial countries are added as zero. *Source: World Bank.*

References

Aghion, Philippe and Patrick Bolton (1997), "A Trickle Down Theory of Growth and Debt Overhang," Review of Economic Studies, 64(2), 151-172.

Acemoglu,D. and F. Zilibotti (1997), "Was Prometheus Unbound by Chance? Risk, Diversification and Growth," Journal of Political Economy,105,709-751.

Aitken, B.J. and A. Harrison (1999), "Do Domestic Firms Benefit from Direct Foreign Investment? Evidence from Venezuela," American Economic Review, 89:3, 605-618.

Barro,R. and J-W Lee (1996), "International Measures of Schooling Years and Schooling Quality,"American Economic Review, 86(2), 218-23.

Barro,R. and Sala-i-Martin (1995), Economic Growth, Mc Graw-Hill Inc.

Barro,R. and Sala-i-Martin (1997), "Technology diffusion, convergence and growth, "Journal of Economic Growth, 2, 1-26.

Benhabib, Jess; Spiegel, Mark M (1994), "The Role of Human Capital in Economic Development: Evidence from Aggregate Cross-Country Data."Journal of Monetary Economics Vol, 34 (2), 143-73.

Beck, Thorsten, R. Levine and N. Loayza (2000b), "Finance and the Sources of Growth," Journal of Financial Economics,, 58: 261-300.

Blomstrom, M. and A. Kokko (1997), "The Impact of Foreign Investment on Host Countries: a Review of the Evidence," World Bank Research Paper, 1745.

Blonigen, B. (1997), "Firm-Specific Assets and the Link Between Exchange Rates and Foreign Direct Investment," American Economic Review, 87:3, 447-465.

Borensztein, E. J. De Gregorio and J-W. Lee (1998), "How Does Foreign Direct Investment Affect Economic Growth?," Journal of International Economics, 45, 115-35.

Branstetter, Lee (2000), "Is Foreign Direct Investment a Channel of Knowledge Spillovers? Evidence from Japan's FDI in the United States.," NBER Working Paper 8015, November.

Caves, Richard (1996), Multinational Enterprise and Economic Analysis, Cambridge University Press.

Calvo, G.; Leiderman, L and Reinhardt,C. (1996), "Inflows of Capital to Developing Countries in the 1990s," Journal of Economic Perspectives , 10:2, 123-39.

Cooley, Thomas and Bruce Smith (1998), "Financial Markets, Specialization and Learning by Doing," Research in Economics 52,333-361.

Coe, David T and Elhanan Helpman (1995), "International R&D Spillovers," European Economic Review Vol. 39 (5). 859-87.

Coe, David T, Elhanan Helpman and Alexander Hoffmaister (1995), "North-South R&D Spillovers," NBER Working Papaer 5048.

Cummins,J. and G. Hubbard (1994), "The Tax Sensitivity of Foreign Direct Investment, Evidence from Firm-level Panel Data," in The Effects of Taxation on Multinational Corporations, ed. M. Feldstein, J. Hines and G. Hubbard.

Dasgupta, D. and D. Ratha (2000), "What Factors Appear to Drive Private Capital Flows to Developing Countries? and How Does Official Lending Respond?," World Bank Research Paper.

Dinopolous, Elias and Peter Thompson (1999), "Reassessing the Empirical Validity of the Human-Capital Augmented Neoclassical Growth Model," Evolutionary Economics Vol. 9, 135-154.

Feeney, J., 1999. International Risk Sharing, Learning-by-doing, and Growth. Journal of Development Economics 58, 297–318.

Feenstra, Robert (1999), "The Role of Foreign Direct Investment", in International Capital Flows edited by M. Feldstein, NBER.

Fernandez-Arias, E. and R. Hausman (2000), "Foreign Direct Investment: Good Cholesterol?," IADB Working Paper, 417.

Froot, K. and J. Stein (1991), "Exchange Rates and Foreign Direct Investment: an Imperfect Capital Market Approach," Quarterly Journal of Economics , 106, 1191-1217.

Galor, O. and J. Zeira (1993), "Income Distribution and Macroeconomics," Review of Economic Studies, 60, 35-52.

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

Grossman,G. and E. Helpman (1995), "Technology and Trade," in Handbook of International Economics Volume III. Edited by Gene M. Grossman and Kenneth Rogoff.

Helpman, E. (1984), "A Simple Theory of International Trade with Multinational Corporations," The Journal of Political Economy, 92:3, 451-471.

Helpman, E. (1985), "Multinational Corporations and Trade Structure," The Review of Economic Studies, 52:3, 443-457.

Helpman, E. (1997), " R&D and productivity: the international connection," NBER Working Paper, No 6101.

Hines, J.(1996), "Altered States: Taxes and Location of Foreign Direct Investment in America," American Economic Review, 86, 1076-1094.

Hull, Leslie and Tesar, Linda (2000,) " Risk, Specialization and the Composition of International Capital Flows," Working Paper,.

IFC (1997), Foreign Direct Investment: Lessons from Experience.

International Monetary Fund. (1998), Balance of Payments Statistics Yearbook .

Kalemli-Ozcan, Sebnem, Bent E. Sørensen, and Oved Yosha (1999), "Risk Sharing and Industrial Specialization: Regional and International Evidence," Brown University Working Paper, 99-16.

King,R. and R. Levine (1993a), "Finance and Growth: Schumpeter Might be Right," Quarterly Journal of Economics 108, 717-738.

King,R. and R. Levine (1993b), "Finance, Entrepreneurship and Growth: Theory and Evidence," Journal of Monetary Economics 32, 513-542.

Klein, M. and Rosengren, E. (1994), "The Real Exchange Rate and Foreign Direct Investment in the United States: Relative Wealth vs. Relative Wage Effects," Journal of International Economics , 36, 373-89.

La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert Vishny (1997), "Legal Determinants of External Finance," Journal of Finance 52, 1131–1150.

La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert Vishny (1998), "Law and Finance," Journal of Political Economy 106, 1113–1155.

Levine, R., N. Loayza and T. Beck (2000a), "Financial Intermediation and Growth: Causality and Causes," Journal of Monetary Economics,, 46:1, 31-77.

Levine,R. and S. Zervos (1998), "Stock Markets, Banks and Economic Growth," American Economic Review 88, 537-558.

Lipsey, Robert (1999), "The Role of Foreign Direct Investment" in International Capital Flows edited by M. Feldstein, NBER.

Lipsey, Robert (2000), "Interpreting developed countries FDI",NBER Working Paper 7810.

Mankiw, Gregory N., David Romer and David N. Weil, 1992, "A Contribution to the Empirics of Economic Growth," Quarterly Journal of Economics, May: 407-437.

Markusen, James and Keith Maskus (1999) "Discrimination among Alternative Theories of FDI", NBER Working Paper 7164.

Markusen, James (1995), "The Boundaries of Multinational Enterprises and the Theory of International Trade," Journal of Economic Perspectives, Vol. 9.

McKinnon, R.I. (1973), Money and Capital in Economic Development Washington: Brookings Institute.

Nelson, Richard and Edmund Phelps, "Investment in Human, Technological Diffusion, and Economic Growth," American Economics Review, 1966, 56, 69-75

Obstfeld, Maurice (1994a), "Risk-Taking, Global Diversification, and Growth," American Economic Review 84, 1310–1329.

Rajan,R. and L. Zingales (1998), "Financial Dependence and Growth," American Economic Review 88, 559-586.

Razin, A., E. Sadka and C. Yuen (1999), "An Information-Based model of FDI: the Gains From Trade Revisited," NBER Working Paper 6884.

Rivera-Batiz, L and P. M Romer (1991), "Economic Integration and Endogenous Growth," Quarterly Journal of Economics, 106(2): 531-555.

Roubini, N. and Sala-i-Martin, X. (1992), "Financial Repression and Economic Growth," Journal of Development Economics, 39(1),5-30.

Rowland, Patrick and Tesar, Linda (2000), " Multinationals and the Gains from International Diversification," Working Paper.

Saint-Paul, G. (1992), "Technological Choice, Financial Markets and Economic Development," European Economic Review.

Sayek, S. (2000), "Foreign Direct Investment and Inflation: Theory and Evidence," Unpublished manuscript.

Scholes, M. and M. Wolfson (1990), "The Effects of Changes in Tax Laws on Corporate Reorganization Activity," Journal of Business 63 ,141-164.

Singh,H. and K.W. Jun (1995), "Some New Evidence on Determinants of FDI in Developing Countries," World Bank Research Paper.

Smarzynska, B. and S-J. Wei (2000), "Corruption and Composition of Foreign Direct Investment: Firm-level Evidence," NBER Working Paper,7969.

Soto, Marcelo(2000), "Capital Flows and Growth in Developing Countries: Recent Empirical Evidence," OECD Development Centre, Technical Papers No. 160.

Stiglitz, J. and A. Weiss (1981), "Credit Rationing in Markets with Imperfect Information," The American Economic Review, 71:3, 393-410.

Swensson, D. (1994), "The Impact of US Tax Reform on Foreign Direct Investment in the United States," Journal of Public Economics 54,243-266.

UNCTAD (1999), Foreign Direct Investment and Development.

UNCTAD (2000), Cross-border Mergers and Acquisitions and Development.

Vernon, Raymon (1966), "International Investment and International Trade in the Product Cycle," Quarterly Journal of Economics.

Wei, Shang-Jin (1997), "Why is Corruption so Much More Taxing than Tax? Arbitrariness Kills," NBER Working Paper, 6255.

Wheeler, D. and A. Mody (1992), "International Investment Location Decisions: the Case of US Firms" Journal of International Economics 33, 57-76.

World Bank (2000), World Bank Development Report .

Wurgler, J. (2000), "Financial Markets and the Allocation of Capital," Journal of Financial Economics 58,187-214.

Xu, Bin (2000), " Multinational Enterprises, Technology Diffusion, and Host Country Productivity Growth," Journal of Development Economics 62 .477-493.

Table 1: FDI Facts

	Value (billion dollars)			Annual growth		
	1982	1990	1999	86-90	91-95	96-99
FDI inflows	58	209	865	24	20	32
FDI inward stock	594	1761	4772	18	9	16
Gross product foreign affiliates	565	1419	3045	16	7	15

Notes: The data is from UNCTAD, World Investment Report, 2000.

Table 2: Summary Statistics

Descriptive Statistics

Sample 1: 39 countries (both developed and developing)

	Mean	Max	Min
Growth	0.02	0.07	–0.03
FDI/GDP	0.01	0.10	0.00
Investment/GDP	0.22	0.39	0.13
Capitalization	0.34	1.40	0.01
Value Traded	0.13	0.59	0.00
M2/GDP	0.51	1.02	0.14

Sample 2: 41 countries (mostly developed)

	Mean	Max	Min
Growth	0.02	0.06	–0.02
FDI/GDP	0.01	0.09	0.00
Investment/GDP	0.23	0.39	0.15
M2/GDP	0.48	0.98	0.15
Private Sector Credit	0.54	1.71	0.12

Sample 3: 49 countries (mostly developing)

	Mean	Max	Min
Growth	0.01	0.05	–0.03
FDI/GDP	0.01	0.18	0.00
Private Sector Credit	0.34	1.23	0.04

Notes: For the 39 country sample the variables are averages for the time period 1981–1997, for the 41 country sample they are averages for 1977–1997 and for the 49 country sample they are averages for 1970–1995.

Table 3: Growth and FDI

Dependent variable—Average annual per capita growth rate

	(1)	(2)	(3)	(4)
Observations	39	39	41	41
log(Initial GDP)	–0.02	–0.02	–0.01	–0.02
	(4.10)	(3.80)	(2.66)	(3.95)
FDI/GDP	0.33	0.28	0.37	0.28
	(2.57)	(2.31)	(2.81)	(2.51)
Schooling	0.003	0.03	–0.001	–0.002
	(0.59)	(0.72)	(0.01)	(0.29)
Population Growth	–0.01	–0.01	–0.76	–0.66
	(3.32)	(3.47)	(2.59)	(2.65)
Government Consumption	–0.1	-0.1	–0.001	0.001
	(1.75)	(2.2)	(0.37)	(0.31)
Latin American Dummy	–0.01	–0.01	–0.01	–0.06
	(2.17)	(0.71)	(2.49)	(1.11)
African Dummy	–0.04	–0.03	–0.04	–0.03
	(4.63)	(3.82)	(3.06)	(3.15)
Institutions	–	–0.02	–	–
	–	(0.77)	–	–
Black Market Premium	–	–0.002	–	–0.01
	–	(0.11)	–	(0.60)
Political Rights	–	–0.04	–	–0.004
	–	(1.01)	–	(1.37)
Inflation	–	–0.01	–	0.004
	–	(0.41)	–	(0.21)
Openness	–	0.01	–	0.02
	–	(1.78)	–	(2.68)
$\bar{R}^2$	0.66	0.71	0.56	0.70

Notes: All regressions have a constant term. t-values are in parentheses. In Columns (1) and (2) we use our first sample of 39 countries. The growth rate, FDI/GDP, population growth, and inflation are averages for 1981–1997, risk of expropriation proxying for institutional quality is averaged over 1985–1995 and number of assassinations, proxying for political rights, is averaged over 1980–1993, and Sachs index for openness, which is average for 1981–1992. The following variables capture initial values: log of initial real per capita GDP, PPP adjusted, measured in 1981, log of secondary schooling enrollment, in 1986, government consumption, net of defense and military spending, as a share of GDP is the average for 1975-1980, the initial black market premium is the average of 1980-1985 and is used as 1+log(black market premium). In Columns (3) and (4) we use our second sample of 41 countries. The growth rate, FDI/GDP, population growth, and inflation are averages for 1977-1997, risk of expropriation proxying for institutional quality is averaged over 1985–1995 and number of assassinations, proxying for political rights, is averaged over 1977–1993, and Sachs index for openness, which is average for 1977–1992. The following variables capture initial values: log of initial real per capita GDP, PPP adjusted, measured in 1977, log of secondary schooling enrollment, measured in 1975, government consumption, net of defense and military spending, as a share of GDP for 1977, the initial black market premium in 1975, and is used as 1+log(black market premium). Schooling (total secondary school enrollment) is used in log form in the regressions to smooth the effect of outliers. We also tried other institutional and political rights variables which gave same qualitative results for all the columns. We also used Asia, East Asia, EU, South East Asia, and West Europe dummies for all the columns, they were found to be insignificant and did not affect the other results.

Table 4: Growth and FDI: The Role of Financial Markets

Dependent variable—Average annual per capita growth rate

	(1) Capit.	(2) Value.	(3) M2/GDP.	(4) M2/GDP	(5) Privcr.	(6) Privcr.
Observations	39	39	39	41	41	49
log(Initial GDP)	–0.02	–0.02	–0.02	–0.02	–0.02	–0.01
	(5.42)	(5.20)	(3.71)	(3.83)	(4.26)	(3.78)
FDI/GDP	–0.60	–0.36	–0.95	–0.77	–0.71	–0.01
	(2.26)	(1.46)	(1.57)	(1.39)	(1.55)	(2.10)
(FDI/GDP)*Financial Markets	0.67	1.28	1.72	1.55	1.28	0.01
	(2.84)	(2.2)	(2.08)	(2.00)	(2.21)	(2.34)
Financial Markets	0.01	0.03	–0.01	–0.02	0.0002	–0.02
	(1.48)	(1.60)	(1.22)	(1.72)	(0.02)	(0.85)
Schooling	0.01	0.003	0.0001	–0.001	–0.001	0.01
	(0.43)	(1.01)	(0.034)	(0.17)	(0.12)	(3.03)
Population Growth	–0.01	–0.01	–0.01	–0.62	–0.68	–0.03
	(5.41)	(5.12)	(3.45)	(2.55)	(3.00)	(0.2)
Government Consumption	–0.1	–0.07	–0.06	0.0001	0.0001	–0.03
	(2.86)	(2.04)	(1.47)	(0.21)	(0.10)	(0.85)
Latin American Dummy	0.01	0.001	–0.003	–0.005	–0.001	–0.01
	(0.18)	(0.45)	(0.42)	(0.98)	(0.24)	(2.40)
African Dummy	–0.03	–0.03	–0.03	–0.03	–0.03	–0.01
	(4.50)	(3.96)	(3.10)	(2.65)	(2.66)	(2.82)
Institutions	–0.001	–0.001	–0.002	–	–	–
	(0.74)	(0.08)	(0.76)	–	–	–
Black Market Premium	0.02	0.01	–0.002	–0.001	0.001	–
	(1.20)	(0.93)	(0.11)	(0.08)	(0.56)	–
Political Rights	–0.003	–0.002	–0.003	–0.004	–0.04	–0.001
	(1.05)	(0.58)	(0.75)	(1.61)	(1.57)	(0.01)
Inflation	–0.01	–0.01	–	–	–0.01	–
	(0.86)	(0.92)	–	–	(0.45)	–
Openness	0.02	0.01	0.02	0.02	0.01	0.01
	(2.76)	(2.58)	(2.68)	(3.24)	(2.76)	(0.23)
$\bar{R}^2$	0.83	0.83	0.75	0.73	0.75	0.63

Notes: All regressions have a constant term. t-values in parentheses. The first three columns use the 39 country sample. Financial market development is measured as capitalization (capit.) in column (1), value traded (value.) in column (2) and log(M2/GDP)in column (3). Inflation is not used in column (3) since it is highly correlated with M2/GDP. Column (4) and (5) uses the 41 country sample. The financial market variables are M2/GDP and private sector credit respectively. Column (6) uses the 49 country data set, which allows a more elaborate measure of private sector credit. See the data section for the detailed definitions of these. The data for columns (1)–(5) are described in table 3. Variables used in column (6) are averages for 1970–1995 for 49 countries. Assassinations is used as a proxy for political rights and it is averaged for 1971–1993. Schooling is average years of schooling in total population and used in log form. Government consumption is defined as a share of GDP. For this sample openness is measured as share of trade in GDP. We also used East Asia and OECD dummies for all the columns and these turn out to be insignificant and did not affect the other results. See notes to table 1 for the definitions of other variables.

Table 5: Growth and FDI — Robustness: Domestic Investment and Human Capital

Dependent variable—Average annual per capita growth rate

	(1)	(2)	(3)	(4)	(5)	(6)
			Capit.	M2/GDP	Privcr.	Schooling
Observations	39	41	39	39	41	49
log(Initial GDP)	–0.01	–0.01	–0.02	–0.01	–0.01	–0.01
	(2.11)	(3.14)	(3.59)	(1.78)	(3.46)	(3.74)
Investment/GDP	0.04	0.01	0.02	0.04	0.01	–
	(3.15)	(2.98)	(2.00)	(3.25)	(2.76)	–
FDI/GDP	0.14	0.14	–0.54	–0.88	–0.79	0.01
	(1.18)	(1.31)	(2.14)	(1.67)	(1.88)	(0.93)
(FDI/GDP)*Financial Markets	–	–	0.57	1.42	1.21	–
	–	–	(2.49)	(2.00)	(2.31)	–
Financial Markets	–	–	0.01	–0.01	–0.01	–
	–	–	(1.22)	(1.99)	(0.76)	–
(FDI/GDP)*Schooling	–	–	–	–	–	–0.03
	–	–	–	–	–	(0.3)
Schooling	0.001	–0.003	0.001	–0.003	–0.001	0.01
	(0.28)	(0.43)	(0.17)	(0.84)	(0.25)	(3.05)
Population Growth	–0.01	–0.92	–0.01	–0.01	–0.92	0.02
	(4.73)	(3.85)	(6.01)	(4.73)	(4.12)	(0.08)
Government Consumption	–0.04	0.001	–0.07	0.002	0.001	0.01
	(0.86)	(0.87)	(1.76)	(0.06)	(0.62)	(0.12)
Latin American Dummy	–0.001	–0.002	0.002	–0.01	0.001	–0.01
	(0.20)	(0.42)	(0.39)	(0.76)	(0.22)	(3.29)
African Dummy	–0.02	–0.02	–0.02	–0.01	–0.02	–0.02
	(2.05)	(2.48)	(2.99)	(1.70)	(2.01)	(4.10)
Institutions	–0.001	–	–0.001	–0.001	–	–
	(0.72)	–	(0.72)	(0.46)	–	–
Black Market Premium	–0.01	–0.01	0.01	–0.02	0.01	–
	(0.65)	(0.49)	(0.64)	(1.16)	(0.58)	–
Political Rights	–0.002	–0.03	–0.002	–0.002	–0.003	–0.001
	(0.55)	(1.04)	(0.74)	(0.54)	(1.40)	(0.35)
Inflation	–0.01	–0.01	–0.02	–	–0.02	–
	(0.81)	(0.54)	(1.08)	–	(1.10)	–
Openness	–0.002	0.01	0.01	0.004	0.01	–0.04
	(0.28)	(1.30)	(0.98)	(0.41)	(1.65)	(0.73)
$\bar{R}^2$	0.78	0.76	0.85	0.81	0.80	0.56

Notes: Column (1) uses the 39 country sample. Investment in column (1) measures log of total domestic investment averaged over 1981–1997. Column (2) uses the 41 country sample, where investment ratio is averaged for 1977–1997, and is in non-log form. Column (3) uses capitalization for financial markets and column (4) uses log(M2/GDP) from the 39 country sample and column (5) uses private credit from the 41 country sample. Using the 49 country sample Column (6) tries a different interaction term, that is it interacts FDI/GDP with schooling. Note that we also tried this for our 39 and 41 country samples and results were the same. All regressions have a constant term. t-values in parentheses. See notes to table 1 and 2 for the definitions of other variables.

Table 6: Domestic Investment and FDI

Dependent variable—Investment/GDP

	(1)	(2)	(3)	(4)
Observations	39	39	41	41
log(Initial GDP)	–2.54	–4.77	–1.17	–2.45
	(2.10)	(3.54)	(1.73)	(1.74)
FDI/GDP	1.42	1.12	1.27	1.01
	(3.40)	(3.36)	(2.92)	(2.72)
Schooling	0.91	1.09	0.74	0.44
	(0.65)	(0.96)	(0.28)	(0.20)
Population Growth	1.05	1.21	1.45	1.91
	(1.10)	(1.58)	(1.51)	(2.33)
Government Consumption	–0.28	–0.33	–0.10	–0.12
	(1.88)	(2.72)	(0.76)	(1.07)
Latin American Dummy	–4.69	–1.65	–4.18	–3.05
	(2.65)	(0.87)	(2.32)	(1.61)
African Dummy	–10.1	–6.71	–8.84	–6.54
	(3.92)	(3.02)	(2.13)	(1.84)
Institutions	–	–0.43	–	–
	–	(0.68)	–	–
Black Market Premium	–	0.12	–	–1.78
	–	(0.3)	–	(0.27)
Political Rights	–	–1.76	–	–0.87
	–	(1.79)	–	(0.95)
Inflation	–	2.75	–	9.29
	–	(0.5)	–	(1.57)
Openness	–	9.48	–	7.08
	–	(3.91)	–	(3.06)
$\bar{R}^2$	0.57	0.74	0.45	0.62

Notes: Left hand side variable is total domestic investment divided by GDP. All regressions have a constant term. t-values in parentheses. First two columns use the 39 country sample, whereas the last two use the 41 country sample. See notes to table 1 and 2 for the definitions of other variables.

Table 7: Growth and FDI — Causality

Dependent variable—Average annual per capita growth rate

	(1) OLS	(2) IV	(3) IV	(4) IV	(5) IV
Observations	39	39	39	39	39
log(Initial GDP)	–0.02	–0.02	–0.02	–0.02	–0.02
	(3.80)	(3.55)	(3.80)	(3.80)	(3.79)
FDI/GDP	0.28	0.44	0.28	0.28	0.29
	(2.31)	(3.01)	(2.29)	(2.29)	(2.32)
Schooling	0.03	0.004	0.002	0.003	0.003
	(0.72)	(0.92)	(0.72)	(0.72)	(0.72)
Population Growth	–0.01	–0.01	–0.01	–0.01	–0.01
	(3.47)	(3.66)	(3.47)	(3.78)	(3.48)
Government Consumption	-0.1	–0.09	–0.01	–0.01	–0.01
	(2.2)	(1.98)	(2.16)	(2.16)	(2.16)
Latin American Dummy	–0.01	–0.01	–0.01	–0.01	–0.01
	(0.71)	(0.85)	(0.71)	(0.71)	(0.72)
African Dummy	–0.03	–0.03	–0.03	–0.03	–0.03
	(3.82)	(3.68)	(3.82)	(3.82)	(3.82)
Institutions	–0.02	–0.002	–0.002	–0.002	–0.002
	(0.77)	(1.01)	(0.77)	(0.77)	(0.78)
Black Market Premium	–0.002	–0.003	–0.002	–0.002	–0.002
	(0.11)	(0.17)	(0.1)	(0.1)	(0.11)
Political Rights	–0.04	–0.003	–0.004	–0.004	–0.004
	(1.01)	(0.80)	(1.01)	(1.01)	(1.01)
Inflation	–0.01	–0.07	–0.01	–0.01	–0.01
	(0.41)	(0.34)	(0.41)	(0.41)	(0.41)
Openness	0.01	0.01	0.02	0.01	0.01
	(1.78)	(1.50)	(1.78)	(1.78)	(1.77)
$\bar{R}^2$	0.71	0.70	0.72	0.72	0.72

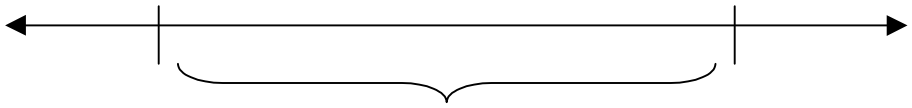
Notes: All columns use the 39 country sample. Column (2) shows the results from 2SLS-IV regression where FDI/GDP is instrumented by financial markets. The instrument used is the initial (1981) value of (capitalization*value traded). Column (3) adds lagged fdi as an additional instrument. Column (4) adds real exchange rate as an additional instrument. Column (5) uses only lagged fdi and exchange rate and not financial markets. Column (1) is the respective OLS regression. All regressions have a constant term. t-values in parentheses. See notes to table 1 for the definitions of other variables.

Table 8: Growth and FDI: The Role of Financial Markets — Causality

Dependent variable—Average annual per capita growth rate

	(1) OLS	(2) IV	(3) IV	(4) IV	(5) IV
Observations	41	41	41	41	41
log(Initial GDP)	–0.02	–0.02	–0.02	–0.02	–0.02
	(4.26)	(3.66)	(3.69)	(3.74)	(3.84)
FDI/GDP	–0.71	–1.62	–1.56	–1.52	–1.58
	(1.55)	(1.97)	(1.94)	(1.84)	(1.87)
(FDI/GDP*Financial Markets)	1.28	2.45	2.37	2.32	2.41
	(2.21)	(2.33)	(2.33)	(2.21)	(2.24)
Financial Markets	0.0002	–0.01	–0.02	–0.01	–0.03
	(0.02)	(0.27)	(0.55)	(0.48)	(0.21)
Schooling	–0.001	0.001	0.002	0.002	0.001
	(0.12)	(0.05)	(0.04)	(0.03)	(0.06)
Population Growth	–0.68	–0.71	–0.71	–0.71	–0.71
	(3.00)	(2.93)	(2.94)	(2.95)	(2.95)
Government Consumption	0.0001	–0.0001	–0.0001	–0.0001	–0.0001
	(0.10)	(0.26)	(0.15)	(0.16)	(0.29)
Latin American Dummy	–0.001	0.002	0.001	0.001	0.002
	(0.24)	(0.31)	(0.20)	(0.19)	(0.35)
African Dummy	-0.03	–0.02	–0.02	–0.02	–0.02
	(2.66)	(1.83)	(1.90)	(1.90)	(1.83)
Black Market Premium	0.001	0.03	0.03	0.02	0.03
	(0.56)	(1.14)	(1.08)	(1.03)	(1.12)
Political Rights	–0.04	–0.01	–0.05	–0.05	–0.01
	(1.57)	(1.58)	(1.69)	(1.68)	(1.58)
Inflation	–0.01	–0.02	–0.02	–0.02	–0.02
	(0.45)	(0.85)	(0.79)	(0.77)	(0.85)
Openness	0.01	0.02	0.02	0.02	0.02
	(2.76)	(2.40)	(2.64)	(2.62)	(2.47)
$\bar{R}^2$	0.75	0.72	0.73	0.73	0.72

Notes: All columns use the 41 country sample. Column (2) shows the results from 2SLS-IV regression where financial markets (private credit) term is instrumented by LLSV variables. The instruments are judicial efficiency and cumulative voting. Column (3) adds proxy by mail as an additional instrument. Column (4) keeps proxy by mail as instrument and uses one vote instead of cumulative voting. Column (5) uses lagged fdi and exchange rate to instrument FDI/GDP in addition to the instruments for financial markets used in column (2). Column (1) is the respective OLS regression. All regressions have a constant term. t-values in parentheses. See notes to table 1 for the definitions of other variables.



t=0

Endowment b_0		Bequest b^i_1
$\varepsilon_{i,0}$		
<u>Choice:</u>		Consume
- Worker	Deposit b_0	$w + r\,(1 + b_0)$
- Entrepreneur	Borrow $S - b_0$	$Y^i - i\,(S - b_0)$

Figure 1: Time Line

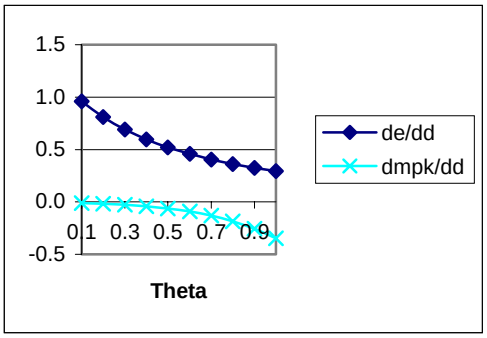


Figure 2.1a

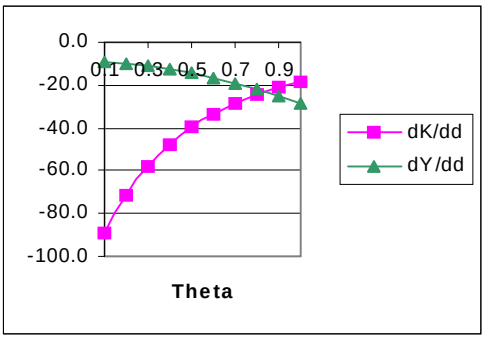


Figure 2.1b

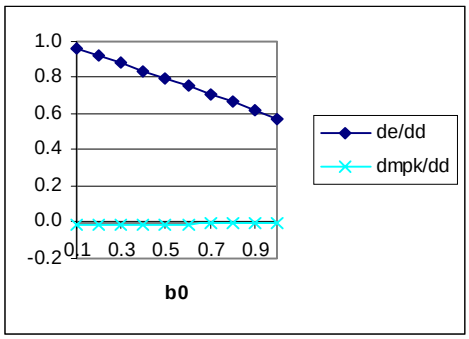


Figure 2.2a

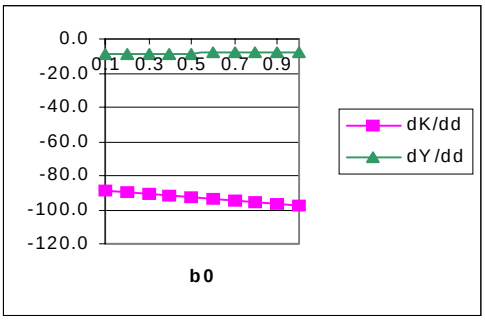


Figure 2.2b

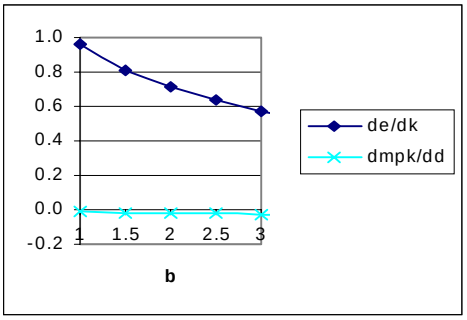


Figure 2.3a

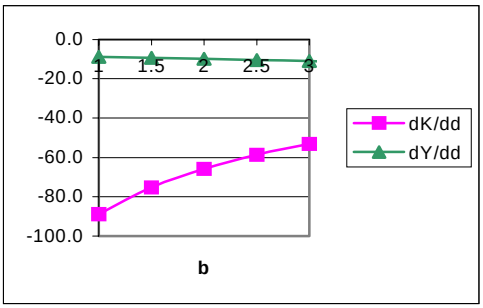


Figure 2.3b

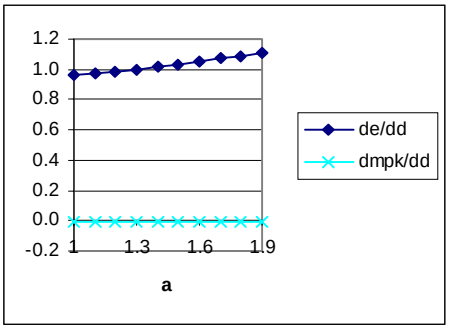


Figure 2.4a

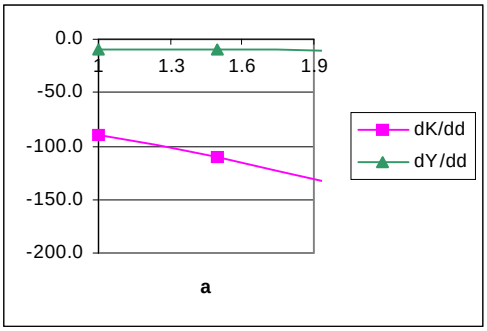


Figure 2.4b

Figure 2
Benchmark Parameter values: S=1; θ=0.35; β=0.67; r=0.01; γ=1;
A(δ)=a/δ; a=1, δ=1; B(δ)=b/δ; b=1.

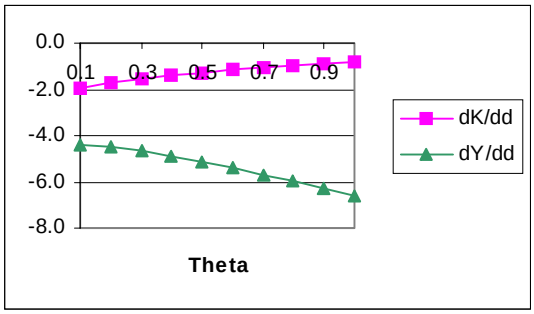


Figure 3.1a

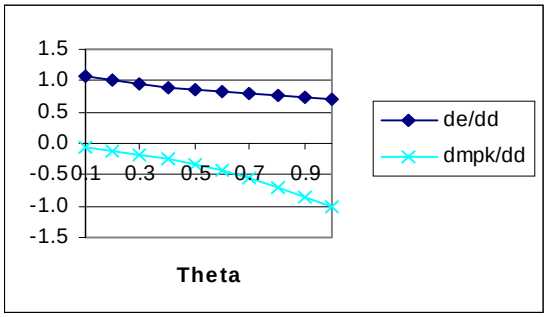


Figure 3.1b

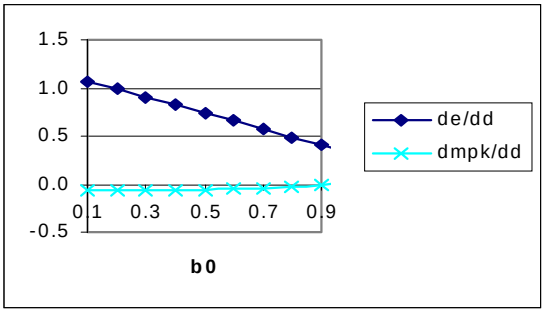


Figure 3.2a

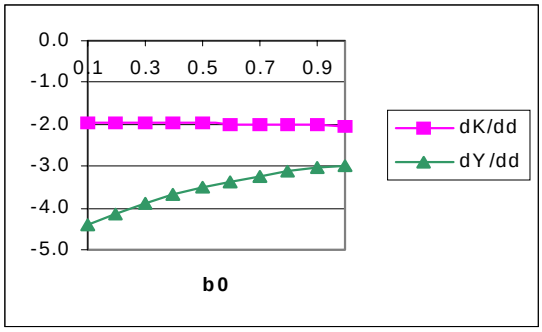


Figure 3.2b

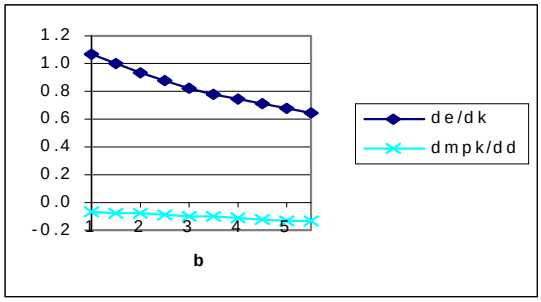


Figure 3.3a

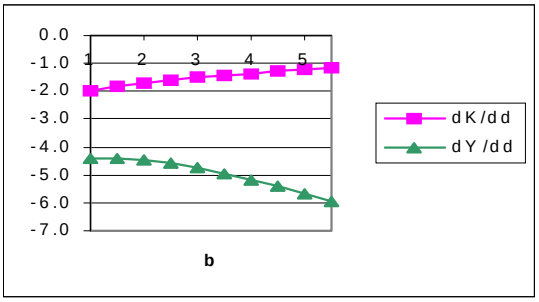


Figure 3.3b

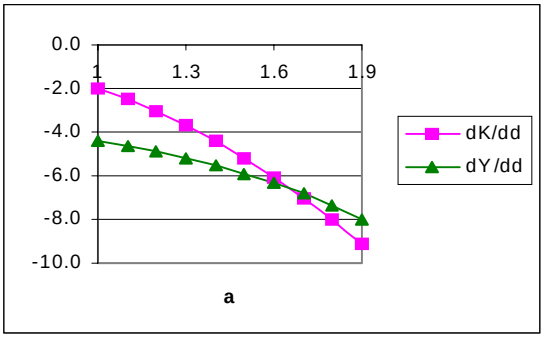


Figure 3.4a

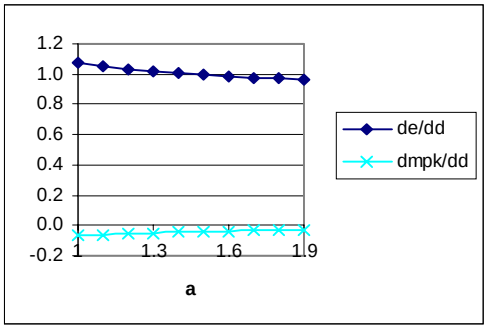


Figure 3.4b

Figure 3

Benchmark Parameter values: S =1; θ=0.1; β=0.67; r=0.1 γ=1;
A(δ)=a/δ; a=1, δ=1; B(δ)=b/δ; b= 3;