The ambiguous relationship between FDI and economic growth

Are financial markets important?

Master Thesis

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Foreign direct investment is an important source of capital for many economies. The inflows of FDI can contribute to productivity through technology transfers. These spillovers should have a positive influence on economic growth. The development of financial markets may play a role in the relationship between FDI and growth. An empirical analysis is carried out to see if the predicted linkages exist in two different samples. The cross-section analysis indicates positive growth effects for FDI in one sample. Financial development interacts negatively with FDI, meaning that a well-developed financial system limits the potential for growth. A panel study confirms these findings, but the results depend on the financial variable included in the regression. It also seems to take time for the domestic economy to absorb and implement the spillovers.

Contents

1. Introduction

Table 1: FDI and GDP data in billions of US dollars, at current prices and current exchange rates.

	Value			Annual growth		
	1990	**2000**	**2011**	**1994-1999**	**2000-2005**	**2006-2011**
FDI inflows	208	1,415	1,700	145	-16	117
GDP	22,604	32,858	71,212	1,014	2,426	4,118

Source: UNCTADstat

Foreign direct investment flows have come to be an increasing portion of worldwide capital flows. Developing countries have taken up efforts to attract investment from multinationals, as it is seen to be beneficial for productivity and employment. The gap in technology level between rich and poor countries can be decreased by foreign investment generating knowledge transfers (Romer, 1993). According to the United Nations Conference on Trade and Development, UNCTAD (2012), foreign direct investment (FDI) is defined as an investment involving a long-term relationship and reflecting a lasting interest in and control by a resident entity in one economy (foreign direct investor or parent enterprise) of an enterprise resident in a different economy (FDI enterprise or affiliate enterprise or foreign affiliate). Such investment involves both the initial transaction between the two entities and all subsequent transactions between them and among foreign affiliates. FDI inflows comprise capital provided by a foreign direct investor to an FDI enterprise, or capital received by a foreign direct investor from a FDI enterprise. Table 1 shows figures on the value and annual growth of worldwide FDI inflows from 1990-2011. The value of FDI inflows increased greatly during the late nineties, and also rose from 2000 to 2011. World GDP more than tripled from 1990 to 2011, making this an interesting period for analysis. The financial crisis that hit the world economy in 2008 did not prevent world GDP to grow by an average of 4000 billion dollar per year from 2006 to 2011. This period was also marked by an increasing interest of multinationals to invest in the developing world. The FDI flows to developing economies reached a record $684 billion in 2011, making up for 45 percent of global FDI (UNCTAD, 2012). The inflows of FDI, divided between developed, developing and transition economies, is shown in figure 1. The graph indicates the steady increase of FDI flows to developing countries. On the other hand, the value of FDI inflows for the developed
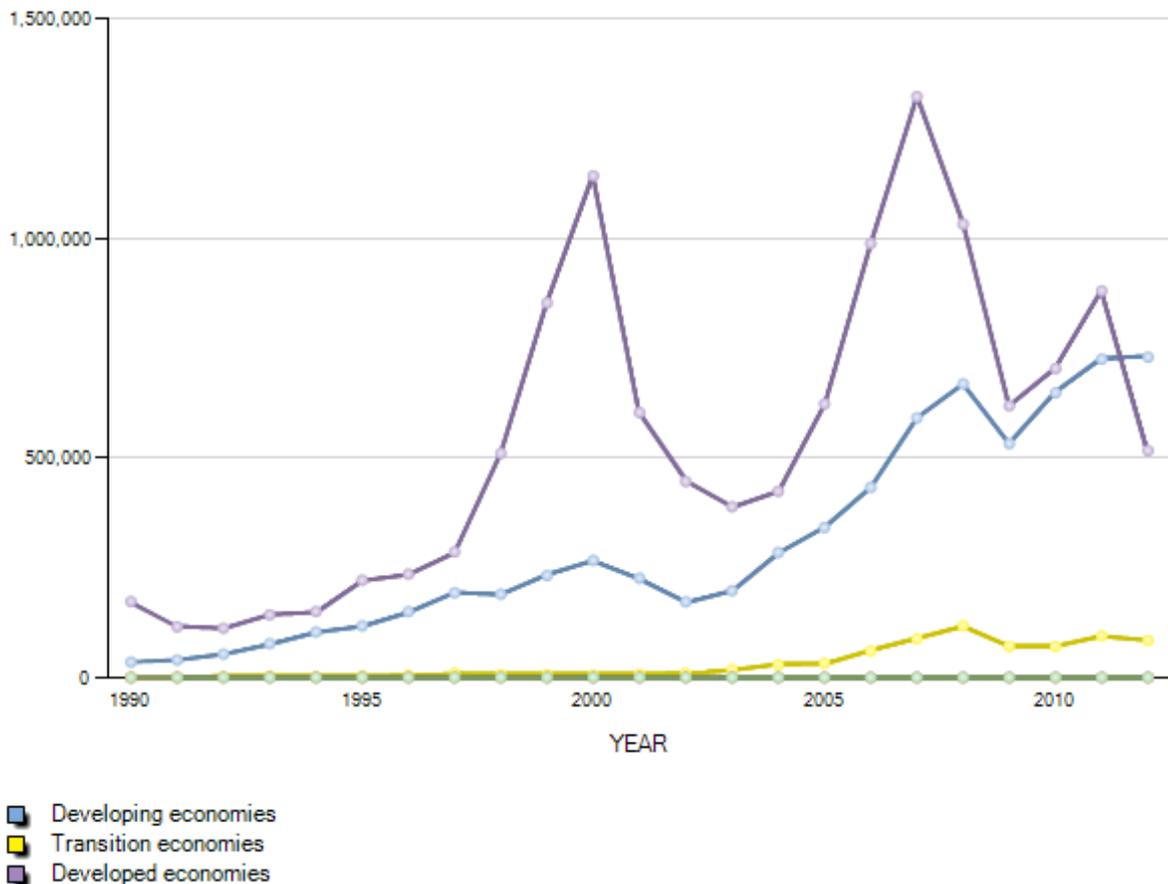
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Figure 1: FDI flows into different groups of countries. Source: UNCTADstat

world dropped significantly from 2007 to 2011. This shift in direction of investment flows could contribute to the catching-up process of developing countries.

Countries can be interested in attracting foreign investment for a number of reasons. Inward FDI has a positive influence on capital accumulation, employment and export opportunities and can bring new technology and knowledge. These benefits are considered to outweigh the costs associated with multinational activity on the host market. Positive externalities that a multinational affiliate may bring are generally seen as 'spillovers', improving the productivity of the local firms operating in the industry. In contrast, the entry of foreign competitors with superior technologies may also drive domestic firms out of the market. This could lead to a monopoly of the multinational, but in most cases the competition gets fiercer once a foreign firm enters the industry (Blomström & Kokko, 1998). FDI is assumed to be positively linked to the growth rate of the country receiving the inflows. Additionally, it has a direct effect of providing capital to be used for productive activity. The domestic banking system and stock market are also important sources of financing for entrepreneurs. The

financial system in general fulfills a lot of functions for an economy, like the allocation of resources, monitoring and risk reduction. When financial markets are sufficiently developed and work effectively, they may contribute to growth through capital accumulation and the implementation of advanced technology. In this regard, the domestic financial system of the host country is complementary in generating the predicted positive spillovers from FDI inflows.

Macroeconomic studies testing the relationship between FDI and economic growth have been carried out with various specifications and country groups. In many cases the results indicate a positive role for FDI, but the effect varies between countries. Lipsey and Sjöholm (2005) argue that the conditions in host countries influence the findings, generating ambiguous results. The development of local financial markets has been used as an indicator of the 'absorptive capacity' of an economy, signaling its ability to benefit from FDI. It potentially determines how the entry of foreign firms generates linkages with the local economy. A well-developed financial system could make them catalysts for economic growth, in line with economic thinking (Alfaro et al., 2004). The empirical research into the role of financial development in the FDI-growth nexus has been taken up recently. The results in the majority of the literature suggest that financial market development promotes the positive effects from FDI.[1] The contribution in this paper focuses on a recent period with great fluctuations in FDI flows, but with a steady growth of inflows in developing countries. This group of countries has a high growth potential, but is likely to be less developed also when it comes to financial markets. Figure 2 shows the values of GDP in 1993 of the main sample used in this study against the value of credits to the private sector. The graph indicates the two variables are positively related. The correlation coefficient of 0.746 confirms this positive relationship. As FDI flows increasingly to lower-income countries, the role of the domestic financial system may change. If those countries benefit from FDI, it would be in spite of a relatively undeveloped financial system. This makes the period from 1994 onwards a period that deserves further investigation. This study will include cross-country and panel data estimations with various financial market variables.

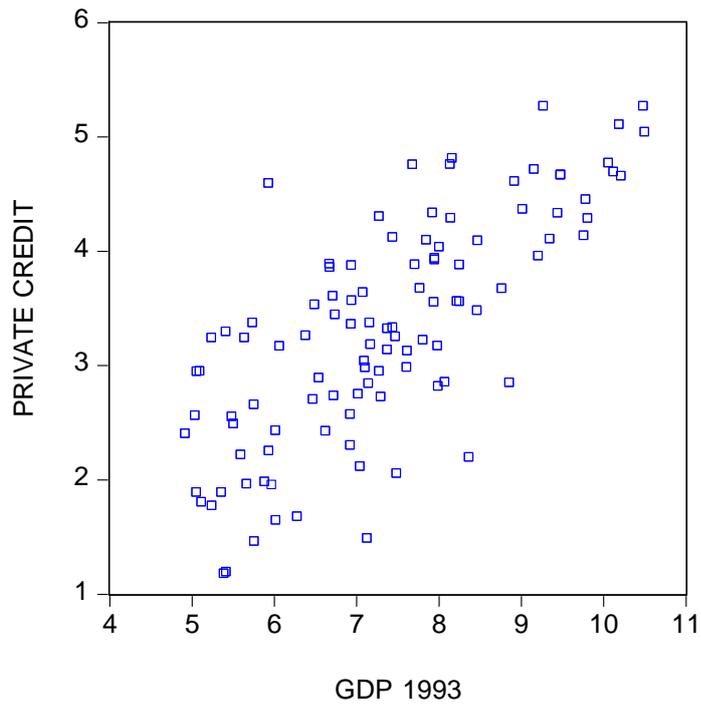
[1] See the next section for more details.

Figure 2: Private credit (averaged over 1994-2008) and GDP in 1993 for 105 countries.

The next section presents a detailed review of the related theoretical and empirical literature. The data are described in section 3. The empirical analysis is discussed in section 4. Section 5 concludes.

2. Literature review

Theory

The relationship between foreign direct investment and economic growth has a basis in the neoclassical and endogenous growth literature. The neoclassical growth theory asserts that economic growth can be realized in two ways: accumulation of production factors and growth of total factor productivity. It is clear that FDI contributes to the amount of productive capital, and thus generates factor accumulation (De Mello, 1997). The influence on total factor productivity is more difficult to identify, but the technology transfer incorporated in FDI flows is widely acknowledged. New technologies, introduced by a foreign firm, may enhance the efficiency of the production process, emphasized by the endogenous growth literature.

In the endogenous growth theory, FDI inflows will have a positive influence on long-run growth by increasing factor productivity. There are four channels through which positive growth effects from FDI may arise: the imitation channel, the skills acquisition channel, the competition channel and the exports channel (Gorg & Greenaway, 2003).

Imitation - The domestic economy is subject to the introduction of new products and processes by multinational enterprises (MNEs). Local companies can grab the opportunity to upgrade their own production to the level of the MNE. How much the domestic industry can benefit from imitation depends on the complexity of the introductions. Haacker (1999) argues this channel induces the most spillover effects.

Skills acquisition - A multinational setting up a firm in the host country needs labor for its production and managerial activities. One reason for the investment in a new plant may be the relatively low wages, but even in that case the demand will generally be for relatively skilled people. The acquired workers will be trained or schooled to be able to be productive in a new environment. The investment in human capital can spill over to existing or new firms. When employees migrate from the MNE to a local firm, they take with them the new knowledge of technology or managerial expertise. They may also use the skills to set up a new business.

Competition - Domestic firms are faced with increased competition when foreign firms enter the market. Through imitation, the local industry can increase its productivity. But even if this is somehow deterred, there is still an incentive to improve on existing technologies. Production processes can be made more efficient to keep up with new competitors. This channel is emphasized by Glass and Saggi (2002).

Export - Multinational subsidiaries possess information about exporting possibilities. To be able to export, firms need to invest in infrastructure, networks and knowledge about foreign markets. MNE are generally experienced in this field, and local firms can learn from them. In that way they can increase their exports, and possibly also productivity. A growing body of studies indicates that exporting and productivity are linked. They suggest that exporting firms are more productive than firms producing solely for the home market.

Findlay (1978) made an important contribution to the literature on host country characteristics and spillovers. He notes that the speed of introducing new technologies depends for a large part on two factors: *relative backwardness* and *contagion.* The difference in development levels between the country receiving and making the investment is captured by the former. The greater this difference, the higher the opportunity and need for the less-developed economy to adopt new technologies. The speed of the implementation is dependent on the degree of contagion. This refers to the activities of the MNE in the local market. The domestic firms get more familiar with new technologies by doing business with the foreign firm. If the MNE sets up its networks in a fast and efficient way, the technology diffusion is promoted.

Foreign direct investment entails opportunities for host country firms to become more productive. It also creates jobs in the local industry. Via multiple channels, knowledge and technology is spread through spillover effects. The extent to which this takes place can depend on local conditions. Keller (1996) makes a case for the importance of *absorptive capacity* in the host country, referring to the stock of human capital. A limited human capital stock can reduce the spillover of foreign technology. Glass & Saggi (1998) stress that the technology gap between the foreign firm and local firms plays an important role in the diffusion process. If the difference in technological progress is small, the host country is more likely to be able to support FDI. The technological distance is also a determinant of the

quality of the potential spillovers. A host country with less developed human physical capital will attract lower quality technologies, limiting the scope of spillover effects. The technology gap signals the potential gains from new technologies, but the ability to implement them successfully is likely to be influenced negatively by it.

 If the theory on productivity spillovers works out in practice has been studied by multiple authors. A range of these studies focus on the effect on the industry level. Gorg & Greenaway (2003) collected the results from 40 studies on manufacturing industries. Nineteen of them find a positive and significant effect of multinational activity on productivity. Others find insignificant or even negative effects. There are some explanations for the lack of influence, or even a reduced productivity. An increase in competition can force local firms to reduce production, driving up average production costs. The competition effect is potentially negative in the short run. When firms are given more time to adjust to new technologies, the average cost curve may be shifted down. There is also the possibility that the MNEs investing in a host economy successfully protect their firm-specific advantages. The spillovers will then leak only slowly to domestic firms, or fail to do so. Another explanation for failing to find positive spillover effects lies in the nature of the studies. If only a small part of the firms in an industry benefit from FDI, aggregate studies might underestimate the significance. They also ignore the vertical spillovers that may arise in distribution networks. MNEs have certain standards regarding input quality, and may help their suppliers conform to these standards. Otherwise, local suppliers are also induced to upgrade their processes independently, to catch up with the requirements of foreign firms.

When focusing on the positive spillovers from FDI, one can also look at the effect on the wage level. Higher productivity of labor must lead to higher wages. Besides the influence of increased productivity, Lipsey and Sjöholm (2001) also indicate that multinationals tend to have higher wages compared to other firms with comparable characteristics. They attribute this to the relatively high technology level of MNEs. In their study, they look at the manufacturing sector in Indonesia and find wages are positively affected by the presence of foreign firms.

Many studies investigate the influence of FDI at the firm level, but the evidence for positive horizontal spillovers is generally weak. However, the results get stronger when authors disaggregate the data, creating groups of comparable firms. The positive effects of FDI are

found to be greater when absorptive capacity is higher and local firms are located close to a foreign subsidiary (Gorg & Greenaway, 2003). Additionally, Moran (2001) argues that vertical linkages between foreign and domestic firms are the best channel for knowledge spillovers. On the other hand, there might be a crowding-out effect of domestic investment as a result of investment by foreign firms. Blonigen and Wang (2005) argue that FDI is less of a deterrent to domestic investment for less developed economies, because they have a shortage of domestic capital. In this regard, the potential of positive effects on growth is greatest for less developed countries.

The neoclassical economic view of MNEs considers them as arbitrageurs, looking for the highest return for their capital, ignoring many of the other functions they serve. According to Hymer (1976), multinationals also play a role in international operations. FDI is not only a process of exchanging financial assets, but represents the transfer of a collection of productive resources. Hymer proposes an industrial organization approach with respect to FDI flows. In addition to Caves (1971), he compares MNEs and domestic firms, and notes that the former encounter additional problems on a host market. Examples are geographical distance and cultural differences. A firm undertaking investment in a foreign economy needs to have ownership advantages over local firms to be competitive. MNEs possess unique skills and have better access to markets and financing sources (Haque, 1992). They are more likely to overcome the barriers to entry than incumbent domestic firms, and are likely to induce more intense competition and greater performance improvements on a host market (Caves, 1971).

The main point in the theoretical literature is that FDI has a positive influence on the technological progress in the host country. The transmission of technological knowledge is seen as the driving force of economic development in the endogenous growth literature[2]. The growth rate of an economy should be positively influenced by the interaction with foreign countries through the resulting knowledge flows (Grossman and Helpman, 1991). FDI can be a source of knowledge transfers. Another model of FDI spillovers is constructed by Borensztein et al. (1998). They emphasize that FDI accelerates growth by reducing the cost of implementing new capital, thereby spurring the factor accumulation rate.

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[2] See for example Romer (1990)

But to what extent a host economy can reap growth from FDI may be determined by local conditions. The development of human capital (Borensztein et al., 1998), establishment of property rights (Smarzynska, 1999) and presence of well-functioning markets (Balasubramanyam et al., 1996) have been found to be important for the degree of spillovers from FDI. An additional country characteristic that might limit or promote the adoption of new technology is the development of domestic financial markets. The mechanisms through which the knowledge of MNEs is spread require the domestic firms to make investments. If they want to benefit from the spillovers, in most cases they will have to upgrade their own factors of production, which is costly. This is the case for the implementation of processes, hiring new labor or training of the existing work force. Local firms looking to make the investments may lack internal finance for their plans. The domestic financial system plays a crucial role in providing firms with the needed financial resources for implementing new technology. Financial institutions mobilize savings, making them available for financing projects. Besides, they also screen and monitor the projects, so that only the efficient ones are implemented. A well-developed financial system is able to carry out these functions, promoting the opportunities for economic growth. The adoption and implementation of new technology is associated with a high degree of risk. Financial institutions can help to mitigate this risk for domestic firms, promoting the speed of the diffusion process. Furthermore, better developed financial markets increase the opportunities of borrowing for the foreign firm. This may determine the scope of the activities of the MNE on the local market (Hermes & Lensink, 2000). Through the mentioned links between financial development and market efficiency, the former may encourage the positive spillover effects of FDI.

Empirical studies

A great deal of studies has tried to find evidence for the relation between FDI inflows and economic growth. A variation of empirical specifications and control variables is used, in search of convincing results. Some studies focus on developing countries, as they have the greatest potential to benefit from FDI. As for the role of the financial system in the effect of FDI on growth, there have been a number of authors that consider this in the analysis, which will be reviewed in detail later. Table 1 presents an extensive overview of studies with varying results.

Table 1: Empirical studies on FDI and growth

Author	Effects of FDI on growth	Sample	Remarks
Nair-Reichert and Weinhold, 2001	Positive	24 developing countries, 1971-1995	
Choe, 2003	Positive, but weak	80 countries, 1971-1995	
Stehrer and Woerz, 2009	Positive	31 countries 1981-2000	
Johnson, 2006	Mixed	90 countries, 1980-2000	FDI enhances growth in developing countries, but not in developed countries
Herzer et al., 2008	Mixed	28 developing countries, 1970-2003	Positive for 4 countries
Azman-Saini et al., 2010	Positive	85 countries, 1976-2005	Countries with greater economic freedom gain more from FDI
Blomstrom et al., 1994	Mixed	78 developing countries 1960-1985	FDI has a positive effect only in relatively high-income countries
Soto, 2000	Positive	44 developing countries, 1986-1997	
Lensink and Morrissey, 2001	Positive	115 countries, 1975-1998	
Lensink and Morrissey, 2006	Positive	87 countries, 1975-1997	
Basu et al., 2003	Positive	23 developing countries	Effect depends on trade openness
Busse and Groizard, 2006	Mixed	82 countries	Effect depends on regulations and institutional frameworks
Lee and Chang, 2009	Positive	37 countries, 1970-2002	A better financial system allows more benefit from FDI
Herzer, 2012	Negative on average, but large cross-country differences	44 developing countries, 1970-2005	Differences explained by business freedom, government intervention, primary export dependence
Choong, 2012	Mixed	95 countries, 1983-2006	Minimum level of financial development is needed for a positive effect of FDI

Saltz, 1992	Negative	68 developing countries, 1970-1980	
De Gregorio, 1992	Positive	12 Latin American countries, 1950-1985	
Oloffsdotter, 1998	Positive	50 developing countries, 1980-1990	
Wang, 2002	Positive	12 Asian countries, 1987-1997	
Alfaro et al., 2004	Positive	49 countries, 1980-1995 & 71 countries, 1975-1995	Financial development promotes the effect of FDI on growth
Hermes & Lensink, 2000	Positive	67 less developed countries	Only significant effect if the financial system is sufficiently developed

Most studies tend to find a positive effect of FDI on economic growth, but in many cases the results are dependent on country characteristics. This limits the ability to draw generalized conclusions with respect to positive spillover effects. Lipsey and Sjoholm (2005) conclude that results often vary between countries within a study, even with an identical model and comparable data. This is mostly attributed to the differences in absorptive capacity, which are determined by the local environment. The conditions determining the success of countries in benefitting from FDI include macroeconomic stability, the state of the infrastructure and human capital. Several authors also mention the development of financial markets as an important factor.

The analysis in this paper draws mainly on the contribution of Alfaro et al., 2004. They utilize a model with a range of financial market variables. Two samples are employed, one for the stock market and the other for the banking system. With a cross-section regression for a range of low- to high-income countries, they look at the direct effect of FDI on the GDP growth rate, as well as an interaction of FDI and financial development. One sample consists of 71 countries over the period from 1975 to 1995, with credit market variables. The second sample covers the equity market, and is made up of 49 countries over 1980-1995. The data is averaged over the sample period, and a selection of control variables is included to allow comparability. Their results point to an important role for the financial system in the relation between FDI and growth. The interaction term is positive for every single financial development indicator with FDI. The financial variables measure liquid liabilities, bank credits, credit to the private sector and the importance of commercial banks, as well as the size of the stock market. The direct effect of FDI is also positive in all regressions, but not

always significant. Therefore, the authors conclude that effect of FDI inflows on economic growth depends on the development of the different financial markets. This conclusion is shared by Hermes & Lensink (2000), though they only consider credit to the private sector. They conduct a cross-country regression with data on 67 less developed countries. The economic growth in those countries depends highly on spillovers of technology from developed countries, indicating that FDI may be strongly growth-enhancing. It is argued that the financial system has to be sufficiently developed for a positive growth effect from FDI in the recipient country. This condition is met in 37 of the economies in the sample. For the other countries, there is no significant effect on growth. Tintin (2012) conducts a growth regression with an index of economic freedoms as explanatory variable. This index, developed by the Fraser Institute, incorporates the quality of various institutions that relate to economic activity. It proves to be very helpful in explaining economic growth. Azman-Saini et al. (2010) also use economic freedoms in their model, and find the interaction with FDI to have a positive effect on growth.

The contribution of this paper is to consider a more recent time period for an expanded set of countries. The variables will be similar to the ones used by Alfaro et al. (2004). In addition to a cross-country regression, I will conduct a panel data analysis. The third section describes data sources and statistics. The fourth section discusses methodology and results. The last section concludes the analysis.

3. Data

The World Development Indicators (WDI) database from the World Bank provides data on FDI flows. Net FDI inflows, taken from the Balance of Payment statistics, measure the net inflows of investment to acquire a lasting management interest in an enterprise operating in an economy other than that of the investor. Gross FDI flows report the sum of in- and outflows of FDI. The net inflows are used in this study, because of the focus on FDI flowing into the economy. Economic growth is the annual per capita real GDP growth rate in constant 2005 US dollars. Government consumption is the ratio of the general government final consumption expenditure to GDP. Inflation is measured by the annual growth rate of the GDP deflator in percentages. To capture the openness to the world market, the ratio of total trade to GDP is included, consisting of the sum of imports plus exports of goods and services. All these variables, plus the annual population growth rate, are taken from the World Development Indicators data. Gross domestic investment relative to GDP comes from the same database. GDP data is from the World Bank national accounts data. It is measured in constant US dollars.

Data on the financial market comes from the World Bank Financial Development and Structure Database. The variables can be divided into two categories, relating to the credit market or the stock market. The variables relating to the stock market were introduced by Levine and Zervos (1998). Stock Market Capitalization to GDP (SCAPT) captures the size of the stock market relative to the economy. It is calculated as the value of listed shares relative to GDP. A measure of stock market liquidity is captured by the total value of shares traded on the stock market relative to GDP (SVALT). The availability of these variables reduces the sample to a number of 73 countries, for the years 1996-2011. The sample countries are listed in the appendix. They include 38 high income countries, 20 upper middle income countries, 12 lower middle income countries, 3 low income countries. The credit market indicators were introduced by Levine et al. (2000). These variables are also collected from the World Bank Financial Development and Structure Database. There are four indicators relating to the credit market. First, the liquid liabilities of the financial system divided by GDP (LLY). This measure includes currency and interest-bearing liabilities of all financial institutions and non-financial intermediaries. Second, the ratio of assets of commercial banks to total bank assets (BTOT), measuring the importance of commercial banks relative to the central bank in allocating savings. Third, the amount of credit by deposit banks to the private sector as a

share of GDP (BANKCR). And fourth, the credits by all financial intermediaries to the private sector divided by GDP (PRIVCR). The sample with credit market variables consists of 105 countries. There are 27 high income countries, 31 upper middle income countries, 30 lower middle income countries and 19 low income countries.

There are two separate samples, a larger one including credit market variables, and a smaller one with equity market variables. These selections are driven by the availability of the data on the financial markets. The smaller sample consists of countries with a growth rate that is on average much lower than the larger sample, while FDI figures are very similar. The mean GDP per capita in 1993 for the 105 countries was $4347. Table 2 reports descriptive statistics for FDI, GDP growth and financial market data. The figures for economic growth and FDI vary considerably between countries. The share of FDI in GDP was highest for Mongolia in 2011, while Suriname experienced the largest disinvestment in 2000. Azerbaijan saw its GDP grow by 33% in 2006, reflecting the highest growth performance. The rate of GDP growth was most negative for Moldova in 1994, reaching -31 percent.

Table 2: Descriptive statistics on growth, FDI and financial markets

Sample 1: 105 countries Period: 1994-2008	Growth	FDI/GDP	BTOT	LLY	BANKCR	PRIVCR
Mean	0.26	0.04	0.83	0.50	0.40	0.43
Max	0.33	0.52	1	2.39	2.73	2.73
Min	-0.31	-0.17	0.12	0.04	0.009	0.009
Standard deviation	0.04	0.05	0.18	0.37	0.39	0.44
Sample 2: 73 countries Period: 1996-2011	Growth	FDI/GDP	SCAPT	SVALT		
Mean	0.03	0.04	0.58	0.40		
Max	0.30	0.54	5.69	7.27		
Min	-0.18	-0.16	0.0003	0.0001		
Standard deviation	0.04	0.06	0.62	0.67		

BTOT: commercial bank assets/total bank assets, LLY: liquid liabilities financial system/GDP, BANKCR: Deposit bank credits/GDP, PRIVCR: Credits to private sector/GDP, SCAPT: Value of listed shares/GDP, SVALT: Value traded on the stock market/GDP

4. Empirical analysis

Cross-section

As FDI reaches more economies, it is possible to find out how growth is affected by the investment inflows. Another question is how this depends on local conditions and markets. To research this, I employ data on financial markets for various countries. This data provides information about the banking sector and stock market. Measures of the development of the banking sector and equity market have found to be correlated with and explanatory for economic growth (Beck et al., 2000). GDP growth is the variable I want to explain, with different explanatory variables. The inflow of foreign direct investment is the most important factor in the analysis. The control variables are taken from Carkovic and Levine (2003), and also included by Alfaro et al. (2004). Countries with a higher initial GDP have less potential for future growth. This is the central point of the neoclassical growth model, where countries are assumed to converge to a steady-state level. Barro (1996) confirms this conditional convergence, noting that countries with a lower GDP per capita to begin with tend to grow faster, keeping all else constant. He also finds a negative growth effect of government consumption, inflation and population growth. Inflation is regarded as an indicator of macroeconomic stability. Central banks have an objective of maintaining price stability, as there are several costs associated with inflation. According to Fischer (1993), the inflation rate of a country signals the ability of a government to manage the economy. High inflation is associated with uncertainty, negatively affecting economic growth. Government consumption is seen as less efficient spending of resources than private expenditure, harming GDP growth. On the other hand there is the structuralist view that certain government expenditure is needed to take away barriers to growth (Landau, 1983). Furthermore, theory predicts a negative influence of population growth on economic growth. When the population grows, capital per worker decreases. Investment is then needed to provide capital for a greater pool of workers, instead of increasing per capita output by increasing capital per worker.

Grossman & Helpman argue that more trade openness is positive for economic growth. Trade affects growth in a same way as FDI, by inducing technological change. The ability to export enlarges the market for domestic firms, making innovation more rewarding. Trade also gives way to the import of advanced inputs, embodying new technologies.

A dummy is added for sub-Saharan African countries, to see if their growth rates deviate from the rest of the sample. The cross-section regression equation is specified as follows:

$$GROWTH_i = \beta_0 + \beta_1\,Initial\,GDP_i + \beta_2\,FDI_i + \beta_3\,CONTROLS_i + e_i$$

The variables capturing the development of the financial market, GDP growth, FDI and the control variables are all averaged over the sample period. The log is taken for the trade and government consumption ratio. This specification allows to identify an aggregate effect over the sample period, similar to the findings of Alfaro et al. (2004). Table 3 shows the results, with and without the inclusion of the domestic investment ratio. The latter has consistently been found to be positively correlated with GDP growth in the empirical literature on economic growth. FDI could turn out to be significant because the ratio of investment to GDP is not included in the analysis. An effect of FDI when controlling for domestic investment indicates positive spillovers, above the direct influence on capital accumulation.

Table 3: Determinants of GDP growth

Period	1994-2008	1994-2008	1996-2011	1996-2011
Variable				
C	6.467	2.460	10.163	5.172
	(2.89)	(1.09)		(2.40)
GDP 1993/1995	-0.525***	-0.421**	-0.764***	-0.589***
	(-2.96)	(-2.56)	(-5.38)	(-4.37)
FDI/GDP	0.172***	0.119**	0.055	0.066
	(3.28)	(2.40)	(1.02)	(1.37)
GOVERNMENT CONSUMPTION/GDP	-0.504	-0.343	0.245	0.142
	(-0.92)	(-0.68)	(0.44)	(0.29)
INFLATION	-0.166	0.001	-0.017	-0.008
	(-0.91)	(0.01)	(-1.06)	(-0.54)
POPULATION GROWTH	-0.947***	-0.790***	-0.603***	-0.440**
	(-4.33)	(-3.87)	(-3.30)	(-2.60)
SUB SAHARAN AFRICA	-0.320	0.151	-0.763	-0.165
	(-0.64)	(0.32)	(-1.35)	(-0.31)
TRADE/GDP	-0.375	-0.522	0.372	0.073
	(-0.89)	(-1.34)	(0.94)	(0.20)
INVESTMENT/GDP		0.133***		0.128***
		(4.368)		(4.09)
R-squared	0.322	0.434	0.412	0.532

Dependent variable: real GDP per capita growth. T-values are in parentheses. *, **, ***, represent significance at the 10%, 5% and 1% level, respectively. Correcting standard-errors for apparent heteroskedasticity leads to similar results.

There is a clear difference between the two samples in terms of the effect of FDI. In the sample with 105 countries, FDI/GDP has a significant positive effect on growth. This result holds when including the domestic investment ratio as explanatory variable. In the other sample there is no sign of a significant growth effect from FDI. The investment share of GDP is positive and significant, as expected, but including it does not alter the significance of FDI. The results reflect the problem in the literature on FDI and growth: the theory predicts a positive role for FDI, but the empirical tests cannot confirm this unambiguously. The distinction between the two samples may stem from the distribution of countries. The sample on the stock market has relatively more high-income countries, where there is less potential for positive spillovers. Less-developed economies have a limited supply of knowledge and skills, so they can benefit more from the interaction with the MNE (Blomström & Kokko, 1998)

The next cross-section model looks at how financial development influences the effect of FDI on growth. It aims to test if financial markets play a role in enhancing the positive externalities from FDI. This is done by adding an interaction between FDI and the financial market variable to the regression, which also includes FDI/GDP and the financial variable as separate explanatory variables. The ratio of investment to GDP is also included, as it is importantly related to growth, and reflects on the positive spillover effect of FDI. Every financial variable is used for a separate regression, leading to the following equation:

$$GROWTH_i = \beta_0 + \beta_1 \, Initial \, GDP_i + \beta_2 \, FDI_i + \beta_3 Financial_i + \beta_4 \, FDI_i * Financial_i + \beta_4 \, CONTROLS_i + e_i$$

The results in table 4 provide more evidence for a potentially positive influence from FDI on GDP growth, though the separate samples show considerable differences in the relationship. The regression for the sample with the equity market variables only produces a significant effect for initial GDP, population growth and investment. The inclusion of the financial variable interacting with FDI does not lead to a significant effect from the interaction, or FDI itself. In the sample concerning the credit market, there is again a positive effect for the rate of FDI to GDP. Three out of four of the financial variables also show positive effects, indicating that a well-developed financial system contributes to economic growth. Only the

ratio of liquid liabilities to GDP is not significant.[3] The sign of the interaction terms in this sample is the result drawing the most attention. Contrary to expectations based on theory and earlier research, the effect of the interaction between FDI and financial markets is negative.

Table 4: Influence of FDI and financial markets on GDP growth

	LLY	BANKCR	BTOT	PRIVCR	SCAPT	SVALT
Variable						
C	1.975	1.991	-17.847	2.074	5.173	5.878
GDP 1993/1995	-0.434***	-0.518***	-0.588***	-0.517***	-0.612***	-0.724***
	(-2.67)	(-2.95)	(-3.72)	(-2.89)	(-3.68)	(-4.35)
FDI/GDP	0.763***	0.534***	3.454***	0.501***	0.073	0.130
	(3.58)	(3.77)	(3.38)	(3.56)	(0.46)	(1.55)
FINANCIAL VAR	0.426	0.646**	4.945***	0.584*	0.064	0.231
	(1.07)	(2.02)	(4.13)	(1.91)	(0.22)	(1.57)
GOVERNMENT CONSUMPTION/GDP	-0.072	-0.104	-0.242	-0.146	0.141	0.043
	(-0.15)	(-0.21)	(-0.51)	(-0.29)	(0.25)	(0.08)
INFLATION	-0.133	-0.035	0.014	-0.033	-0.008	-0.012
	(-0.74)	(-0.19)	(0.09)	(-0.18)	(-0.50)	(-0.79)
POPULATION GROWTH	-0.730***	-0.753***	-0.742***	-0.758***	-0.455**	-0.512***
	(-3.71)	(-3.83)	(-3.89)	(-3.83)	(-2.51)	(-2.92)
SUB SAHARAN AFRICA	-0.051	0.100	0.276	0.087	-0.178	0.006
	(-0.11)	(0.21)	(0.60)	(0.18)	(-0.33)	(0.01)
TRADE/GDP	-0.260	-0.278	-0.654*	-0.249	0.084	0.211
	(-0.68)	(-0.72)	(-1.77)	(-0.64)	(0.23)	(0.57)
INVESTMENT/GDP	0.129***	0.123***	0.122***	0.124***	0.127***	0.116***
	(-3.10)	(4.17)	(4.30)	(4.17)	(3.98)	(3.64)
FDI*Financial	-0.173***	-0.132***	-0.751***	-0.121***	-0.002	-0.019
	(-3.10)	(-3.11)	(-3.25)	(-2.88)	(-0.06)	(-0.94)
R-squared	0.494	0.487	0.523	0.481	0.533	0.551

Dependent variable: real GDP per capita growth. T-values are in parentheses. *, **, ***, represent significance at the 10%, 5% and 1% level, respectively. Correcting standard-errors for apparent heteroskedasticity leads to similar results.

An explanation for this finding may be the role of the technology gap existing between the recipient country and the multinational. The financial system serves as a proxy for the overall development level of an economy, and thus signals the potential for technology spillovers. This means that countries with well-developed financial markets have limited scope for positive externalities, as the technology level will be closer to that of the MNE. FDI can generate more positive spillovers in developing economies, where the initial technology level is lower. This resounds with the findings of Johnson (2006), who notes a difference in the

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[3] This variable is significant at the 10%-level when investment/GDP is not included. These regressions are not reported, as all other results are very comparable.

relationship between FDI and growth in developing and developed countries. His results indicate that FDI enhances growth in developing countries, but not in developed countries. The development of a country is not only determined by its financial system, but it is an important indicator.

For the sample with significant effects for the relevant variables, some additional analysis is performed. To see if FDI positively contributed to growth in the sample countries, the net effect of FDI on GDP growth is calculated for each country. The net effect is obtained by calculating $\beta_2 * FDI_i + \beta_4 * FDI_i * Financial_i$. Table 5 shows the distribution of the number of countries experiencing a positive growth effect from FDI and the number of countries where FDI seems to limit growth. The net effect of FDI is positive for the majority of countries in each of the samples. Two economies return a negative growth effect with all financial variables. Not surprisingly, these are the only countries with a negative inflow of FDI over 1994 to 2008.

Table 5: Net effects of FDI with different variables

	BTOT	LLY	BANKCR	PRIVCR
Period	1994-2008	1994-2008	1994-2008	1994-2008
Number of countries	105	105	105	105
Positive net effect	103	86	77	80
Negative net effect	2	19	28	25

Net effect is equal to $\beta_2 * FDI_i + \beta_4 * FDI_i * Financial_i$

Panel-data analysis

As an addition to the existing literature on FDI, economic growth and the role of financial markets, I will perform a panel data analysis. The sample used in the panel regression is the one with the credit market variables, which delivered the most results of interest. These results could be driven partly by the use of average values for the variables in the previous analysis. As FDI figures deviate substantially between years, there is a possibility of misinterpretation by focusing on a cross-section analysis of multi-year data. A panel

regression allows exploiting the time-series component. The specification of the model is as follows:

$$GROWTH_{it} = \alpha_i + \beta_{0t} + \beta_1\, Financial_{it} + \beta_2\, FDI_{it} + \beta_3\, FDI_{it} * Financial_{it}$$
$$+ \beta_4\, CONTROLS_{it} + e_{it}$$

The estimation method employs both period and cross-section fixed effects, using all the variation in the data. The constant term is now calculated separately per country for each year. Trade, government consumption, population growth, inflation and domestic investment are again included as control variables. The level of initial GDP is dropped because of the time- and country-specific intercept. Table 6 shows the results for the regressions with the different variables used as indicators of financial development.

Table 6: Panel regression FDI, financial markets and growth

Variable	LLY	BANKCR	BTOT	PRIVCR
FDI/GDP	0.148	0.006	0.051	0.048
	(1.31)	(0.16)	(0.14)	(0.70)
INFLATION	-0.004***	-0.004***	-0.004***	-0.004***
	(-6.21)	(-6.09)	(-6.22)	(-6.09)
POPULATION GROWTH	-0.004	-0.005*	-0.005**	-0.005*
	(-1.37)	(-1.96)	(-1.99)	(-1.94)
TRADE/GDP	0.021***	0.019***	0.019***	0.019***
	(3.08)	(2.83)	(2.83)	(2.83)
GOVERNMENT CONSUMPTION/GDP	-0.038***	-0.039***	-0.040***	-0.039***
	(-5.98)	(-6.17)	(-6.25)	(-6.16)
Financial	-0.013**	0.003	0.019***	0.003
	(-2.37)	(1.04)	(2.62)	(0.93)
FDI*Financial	-0.033	-0.009	-0.008	-0.009
	(-1.15)	(-0.49)	(-0.10)	(-0.50)
INVESTMENT/GDP	0.159***	0.158***	0.154***	0.159***
	(6.35)	(6.21)	(6.16)	(6.23)
R-squared	0.357	0.353	0.356	0.353

Dependent variable: real GDP per capita growth. T-values are in parentheses. *, **, ***, represent significance at the 10%, 5% and 1% level, respectively. Correcting standard errors for apparent heteroskedasticity leads to similar results.

While a number of variables show a significant effect that was previously not indicated, there are also variables that are no longer significant. All samples show a negative effect of inflation and government consumption, and a positive effect of trade. The effects confirm the hypothesized influence on growth for the mentioned variables. As for the financial variables,

the findings are ambiguous. More activity by commercial banks relative to the central bank promotes economic growth. On the other hand, the ratio of liquid liabilities of the financial system to GDP seems to affect the growth rate negatively.

When looking at the effect of FDI in the panel data analysis, there is no sign of either a positive or a negative influence on growth. The same holds for the interaction term between FDI and the financial variable. This could mean that there is no relation between FDI inflows and economic growth, though the cross-section model pointed to a sizable impact. Another possibility is that it takes time for the local economy to benefit from the positive externalities. This would explain the significant effect for the averaged data. To find out if the lack of an impact is due to the time the economy needs to absorb spillovers, I include a regression with lagged variables. Every variable is lagged one period, except the investment ratio. Also added is a lagged value of the dependent variable. The results of this additional specification are reported in table 7. The significance of certain variables changes when applying White standard errors, indicating there might be a problem with heteroskedasticity. Therefore, I report the t-values under the corrected standard errors.

Table 7: Panel regression FDI, financial markets and growth with lagged variables

Variable	LLY	BANKCR	BTOT	PRIVCR
FDI/GDP	0.557***	0.003	0.662	0.340***
	(3.06)	(0.09)	(1.30)	(3.21)
INFLATION	-0.002	-0.002	-0.002	-0.002
	(-1.44)	(-1.46)	(-1.56)	(-1.46)
POPULATION GROWTH	-0.002	-0.001	-0.002	-0.001
	(-0.52)	(-0.42)	(-2.08)	(-0.40)
TRADE/GDP	0.024***	0.024***	0.024***	0.024***
	(2.95)	(2.93)	(2.96)	(2.95)
GOVERNMENT CONSUMPTION/GDP	-0.011	-0.011	-0.011	-0.011
	(-1.10)	(-1.08)	(-1.02)	(-1.08)
Financial	-0.002	0.001	0.003	-0.000
	(-0.29)	(0.17)	(0.40)	(-0.03)
FDI*Financial	-0.125***	-0.073***	-0.129	-0.073***
	(-2.89)	(-2.98)	(-1.13)	(-2.96)
INVESTMENT/GDP	-0.046	-0.045	-0.027	-0.044
	(-1.17)	(-1.14)	(-0.66)	(-1.13)
GDP GROWTH	0.196***	0.201***	0.202***	0.202***
	(4.92)	(4.93)	(4.90)	(4.93)
R-squared	0.394	0.393	0.386	0.393

Dependent variable: real GDP per capita growth. All variables are lagged one period. T-values are in parentheses. *, **, ***, represent significance at the 10%, 5% and 1% level, respectively. White standard-errors are applied.

Again, the results differ depending on which financial variable is included. The ratio of FDI to GDP is significant at the 1 percent level in two samples, but not significant at all in the other two. When FDI is significant, it shows a positive effect. The interaction term with FDI is significant and negative for three of the four financial variables. Only in the sample with the ratio of commercial bank assets to total bank assets, there is no sign of an impact of FDI at all. Other results are similar to the regression without lags. The findings suggest an existence of positive spillovers in the longer term, with greater spillovers for countries with lower financial development. Of course, the implementation of new technologies may take even longer than a year, and the benefits can only be realized further into the future. To find out how the spillovers of FDI exactly spread through the economy is not in the scope of this study. The results here presented suggest a positive effect over time, though the evidence is not unambiguous for different specifications. Further empirical research may focus on the details of the linkages between FDI and economic growth.

5. Conclusions

Foreign direct investment constitutes a growing proportion of global capital flows. Developing countries are now trying to increase their inflows of FDI, and the efforts seem to pay off. Multinational enterprises invest more and more in developing economies, bringing with it advanced technology and knowledge. The host country can gain from the positive spillovers that FDI is widely acknowledged to hold. These externalities can arise through the interaction between the MNE and local firms. The endogenous growth theory puts the emphasis on productivity growth, and FDI can contribute to this through different channels: imitation, skills acquisition, competition and exports. To reap the benefits from FDI, an economy must be able to absorb the technology transfers. The development of the financial system is argued to be important in this regard. If financial markets are well-developed, local firms are better able to upgrade their processes and implement new technology. On the other hand, less-developed countries have more to gain from FDI. The results of the empirical analysis provide some evidence for the latter assumption. The positive relationship between FDI and economic growth is confirmed, but the effect mitigates when credit markets are more developed. Besides, the composition of the sample plays a role. When applying a panel-data estimation, the results suggest the positive influence of FDI is not immediate. As some of the findings contradict with the theory and other empirical research, there might be other predictions to be made when working with mixed samples. Focusing only on developing or developed countries could lead to other results. All in all, the role of financial markets in the FDI-growth nexus is ambiguous, just like the effect of FDI itself.

Appendix

Countries sample 1996-2011

Argentina	Hong Kong SAR, China	Pakistan
Australia	Hungary	Panama
Austria	Iceland	Peru
Bangladesh	India	Philippines
Barbados	Indonesia	Poland
Belgium	Ireland	Portugal
Bolivia	Israel	Romania
Botswana	Italy	Russian Federation
Brazil	Jamaica	Saudi Arabia
Bulgaria	Japan	Singapore
Canada	Jordan	Slovak Republic
China	Kenya	Slovenia
Colombia	Korea, Rep.	South Africa
Cote d'Ivoire	Kuwait	Spain
Croatia	Lithuania	Sri Lanka
Cyprus	Malaysia	Sweden
Czech Republic	Malta	Switzerland
Denmark	Mauritius	Thailand
Ecuador	Mexico	Trinidad and Tobago
Egypt, Arab Rep.	Mongolia	Tunisia
Finland	Morocco	Turkey
France	Nepal	United Kingdom
Germany	Netherlands	United States
Ghana	Nigeria	
Greece	Norway	

Countries sample 1994-2008

Algeria	Dominican Republic	Kenya	Slovenia
Argentina	Ecuador	Korea, Rep.	Solomon Islands
Armenia	Egypt, Arab Rep.	Lao PDR	South Africa
Australia	El Salvador	Lithuania	Spain
Azerbaijan	Ethiopia	Macedonia, FYR	Sri Lanka
Bahamas, The	Finland	Madagascar	St. Kitts and Nevis
Bangladesh	Gabon	Malawi	St. Lucia
Belize	Gambia, The	Malaysia	St. Vincent and the Grenadines
Benin	Germany	Mali	Sudan
Bolivia	Ghana	Malta	Suriname
Brazil	Greece	Mauritius	Swaziland
Bulgaria	Grenada	Moldova	Switzerland
Burkina Faso	Guatemala	Morocco	Syrian Arab Republic
Burundi	Guinea-Bissau	Mozambique	Tanzania
Cabo Verde	Haiti	Nepal	Thailand
Cameroon	Honduras	New Zealand	Trinidad and Tobago
Central African Republic	Hungary	Niger	Tunisia
Chad	Iceland	Nigeria	Turkey
China	India	Pakistan	Uganda
Colombia	Indonesia	Panama	Ukraine
Costa Rica	Iran, Islamic Rep.	Papua New Guinea	United States
Cote d'Ivoire	Israel	Paraguay	Uruguay
Croatia	Italy	Philippines	Vanuatu
Cyprus	Jamaica	Poland	Zambia
Czech Republic	Japan	Portugal	
Denmark	Jordan	Russian Federation	
Dominica	Kazakhstan	Senegal	

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