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Foreign direct investment, economic growth and the moderation role of host country's financial market

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Abstract

foreign investments have always been welcome and policy makers always do their best in order to attract more and more capital into their area; But a question which gave rise to a series of studies is that is FDI always beneficial for the recipient and does it under all circumstances help the growth in the host economy? In order to answer this question, we first examined whether or not FDI, by itself, has any significant impact on growth and the results proved that FDI affects growth positively in our full sample. We then show that FDI's effect on growth is different in developed and non-developed countries. A surprising finding in our study is that in developed countries foreign flows of investment do not affect economic growth where this effect in non-developed countries is relatively high and significant. Three different stock market indicators (market capitalization, value traded and turnover ratio) are then introduced and it is tested whether the differences in FDI's impact in developed and non-developed countries is due to their stock-market-related financial absorptive capacities. Our key contribution in this paper, along with our other novel findings, is that we introduce cut-off levels for these three indicators which successfully split our sample into one sub-sample in which FDI strongly affects growth and one in which FDI's effect on growth diminishes.

Keywords: Absorptive Capacity, Detecting Cut-off Levels, Economic Growth, Foreign Direct Investment (FDI), Stock Market Development.

DOI:

Introduction

It has always been subject of extensive arguments whether foreign direct investment (FDI) could have any effect on the economic growth of the host region. Hypotheses argue that FDI might enhance the economy of its host countries through different means of technological diffusion taking place via knowledge and capital goods spillovers. in this debate, though no significant evidence has supported the bare effect of FDI on economic growth, many papers have been published investigating the role of supplementary preconditions affecting the impact of FDI inflows on economic growth of the recipient economy mostly called the absorptive capacity of the host country which we will discuss later in literature review section. Spillover theory suggests that FDI can help enhance productivity and economic growth via factors like boosting technological transfer or labor training but many studies have recorded no significant proof to this claim which will be reviewed in the literature summary. This strengthens the hypothesis that although FDI inflow has a potential of revolutionizing the recipient economy, the extent of growth and development it leaves behind totally depends on the ability of the host country to absorb and make use of the opportunities laid by FDI investors.

In recent years, it has been a big concern for policymakers to create an absorptive atmosphere of their territory. The rationale for 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, managerial skills, and know-how in the domestic market, employee training, international production networks, and access to markets (Laura Alfaro .et.al 2004). Among factors shaping the absorptive capacity of a region, institutional structure (i.e. governance index, corruption perception index, DOI indicator, etc.) and the level of financial development stand out based on what the literature suggests.

The role of financial markets development in the recipient country has been investigated in several studies (Nieles Hermes and Robert Lensink 2010, Laura Alfaro .et.al 2004) all concentrating on the host's banking system as an indicator of financial development. In this paper we focus our analysis on the moderation role of the host economies' stock market structures as one of the determinants of financial atmosphere in an economy. to do that, in the first step we check if FDI inflow has any significant impact on the level of economic growth following our analysis with adding the role of financial absorptive capacity of the host to see whether the results change.

Many studies claim that financial development can improve the positive effect of FDI on economic growth (Laura Alfaro et al., 2004, Nieles Hermes & Robert Lensink, 2010, W.N.W. Azman-Saini et al., 2010). Others introduce factors like economic freedom and property rights as characteristics of the host which fosters the effect of FDI on growth (e.g. Azman-Saini et al., 2010,

Smarzynska, 1999). Hence, the overall agreement is that in developed countries, with higher levels of financial development, property rights, economic freedom, etc., foreign investment flows must have a higher positive impact on economic growth. This is what we challenge in our study and is considered as one of the major contributions of our work.

Previous studies in literature claim that the effect of foreign investment flows on growth is through technological diffusion which is fostered by good absorptive capacities of the host. In developed economies technological diffusion is mostly indigenous and transfer of technology does not depend on exogenous flows to the extent that it does in other non-developed nations. Hence, our first hypothesis is that FDI's effect on growth of developed countries must be lower than that of non-developed countries. We test this and our empirical results support our hypothesis which means that the effect of FDI on economic growth is significantly higher in non-developed economies. We then take stock market variables of the host into consideration and according to our prior findings hypothesize that the effect of FDI on growth must diminish with stock markets getting more developed which is a key characteristic of developed nations. Empirical tests also prove our second hypothesis implying that as the stock market of the host gets more developed the effect of FDI on economic growth declines.

Our findings are based on statistics from 74 countries including stock market and FDI inflow data. Our study is divided into four steps; In the first step, it is re-tested whether FDI itself can have any significant impact on the economic growth of the recipient economy; next, we test the hypothesis that FDI's effect on growth may be different in developed and non-developed countries. Then the indicators of financial development are taken into account letting us measure the effect of FDI on economic growth in the presence of absorptive capacities in terms of financial determinants. Based on findings of the first two parts, in the last section we measure the cut-off limits for our financial variables that split our sample into two sub-samples each with different FDI-growth characteristics.

Literature Review

As discussed in the previous sections, it is hypothetically believed that flow of foreign investments can have a bare effect on the economic growth of the recipient country; meaning that regardless of the preconditions of the host, FDI can cause economic growth via transferring knowledge and technology as well as capital flows. The growth, most importantly in less developed countries(LDCs) is strongly dependent on the level of technology developments which is one of the major benefits of foreign investment flows referred to as technology diffusion, or spillover.

Several studies have been conducted with the aim to investigate the role of FDI on economic growth of the recipient (see for instance Tvaronaviciene and Grybaite, 2007; Reganati and Sica, 2007; Cai et.al., 2018) ; and yet surprisingly contradictory results have been measured. Some studies have proved FDI to have positive effect on economic growth (De Mello, 1999; Chong et al., 2010) while other studies have shown neutral or insignificant effect (Ericsson and Irandoust, 2001,Gunby et.al., 2017); and even some negative relations have been measured (Moran, 1998). Gui-Diby (2014) finds the FDI's effect on growth to be negative before 1995 and positive afterwards. These contradictory results imply that there must be some other factors having the major effect on economic growth through FDI spillovers rather than the investment itself. These factors or so called pre-conditions are referred to as absorptive capacity of the host economy.

In the effort to investigate elements of absorptive capacity, studies have introduced variety of factors including quality of labor force, institutional variables, financial markets, trade policy, etc. Azman-Saini et al. (2010) investigated the role of institutional variables on growth. His study argues that FDI does not have any significant impact on economic growth but when taking into account the variable EF (economic freedom), the interaction term seems to have significant positive effect on growth. Others have measured the effect of property rights on attracting high technology FDI (Smarzynska, 1999). As discussed before, the major channel through which FDI can affect the level of growth in an economy is through technological diffusion which is strongly dependent on the level of property rights and risk of expropriation in the host country generally referred to as the risk of nationalization.

Technology spillovers can only take place through the host country's work force or the so called human capital; hence, the level of human capital development is another determinant factor for the level of absorptive capacity of the host. Borensztein et al. (1998) argues that there is a minimum or threshold level of human capital for technological diffusion to take place.

Among all studies, the ones regarding the financial development level of the host seem to be the least investigated issue. The arguments regarding the finance- growth nexus were generated by Schumpeter a century ago. He recognized the importance of a well-functioning financial market as a requirement for technological development, capital accumulation and growth. Schumpeter argues that a well-developed financial market enhances the growth by guaranteeing that the capital is invested in the projects with the highest return. Bringing this conclusion to the area of FDI-growth relationship, it is implied that in presence of well-functioning financial atmosphere, domestic firms are inclined to absorb new and efficient technologies which is assumed to have been brought in by the foreign investors rather than stick to old, inefficient methods and projects. The projects involving technology adoption and process modification are often riskier than other types of projects keeping

firms away from undertaking it. In presence of developed financial systems in general this risk is modified thus stimulating domestic managers to undergo technology adoptions via foreign technology spillovers (Huang and Xu, 1999). Reliable and dynamic financial systems on the other hand improve saving opportunities, providing domestic and foreign firms with bigger resources of finance for expanding activities and growth (Nieles Hermes & Robert Lensink, 2010). The foreign capital flow is just a part of all the investment needed for an investment project to take place and some of it is finance through debt and/or equity from the financial markets of the host country including banks and capital markets (Borensztein et al., 1998). Well-developed markets also provide better competition environments and remove market distortions so stimulating better growth atmosphere in the recipient country, enhancing the knowledge transfer among firms (Bhagwati 1978, Ozawa 1992, Balasubramanyam et al., 1996).

In the literature of finance-growth nexus some important- yet insufficient- studies have been conducted. Laura Alfaro et al., (2004) argue that in spite of FDI's ambiguous role in economic growth, in countries with better economic conditions this role empirically proves to be significantly positive. Nieles Hermes & Robert Lensink (2010) also empirically argue that well-functioning markets play an important role in fostering technology spillover, hence, positively affecting growth. W.N.W. Azman-Saini et al. (2010) takes the debate to the next level claiming that there is a minimum level of financial development which is required for FDI to improve growth. Among the above-mentioned studies, the majority have considered banking systems of host countries as the representatives of financial market development level, excluding Alfaro's work which investigates both variables of stock markets as well as the banking system determinants.

In this paper, we are interested in testing the effect of FDI on growth in economies with developed and undeveloped stock markets to see if this effect changes in presence of different levels of stock market development so we focus our analysis on stock market variables data. Our main hypothesis is that FDI's effect on growth must diminish as development variables increase. First we repeat the former investigation on whether FDI-in absence of any other consideration- can have positive effect on growth. Then the FDI-growth nexus is measured using interaction with capital market variables; finally, as our main contribution, we propose a threshold level for stock market variables which splits our sample into two groups based on the effect of FDI on economic growth.

Data

Our analysis relies on yearly data[1] gathered from 74 countries for the time period during 2000-2014. The fundamental variables defined in our data set include FDI as percentage of GDP, per capita gross domestic product, stock market capitalization divided to GDP, stock market turnover ratio and value traded in stock market as percentage of GDP. in some years and in some countries there are some missing observations which can be overlooked due to the big set of observations available compared to the missing ones. As explained before, one of the aims of this article is to investigate the finance-growth nexus regarding the effects of foreign direct investments. Reviewing the literature for growth several variables are suggested to have affected growth according to empirical studies; including Levine and Renelt [1992], King and Levine [1993], and Levine et.al. [2000]. The growth variables used in this paper include: quality of governance, economic freedom, gross capital formation, inflation, years of secondary schooling, government final consumption expenditure, level of countries' trade as percentage of GDP and population growth. These variables are divided into main and control variables. Table 1 includes the definition of each variable, the source and whether it is a main or control variable.

Table 1. variables and definition

abbreviation	Definition	source	Main/control
LEF	Log of Economic freedom	QOG	Control
LGCF	Log of Gross capital formation(%GDP)	WDI	Control
LGFCE	Log of Government final consumption expenditure (%GDP)	WDI	Control
LTRADE	Log of Level of country's trade (%GDP)	WDI	Control
POPGROWTH	Population growth	WDI	Control
LMCAP	Log Stock market capitalization	GFD(WDI)	Main
LVT	Log Stock market value traded (%GDP)	GFD(WDI)	Main
LTVR	Log Stock market turnover ratio	GFD(WDI)	Main
LFDI	Log of Net Foreign direct investment flow (%GDP)	WDI	main
INFLATION	Inflation	WDI	Control
SECYR	Years of Secondary schooling	WDI	Control
LPCGDP	Log Per capita GDP	WDI	Dependent
GROWTH	Percentage change in per capita GDP	WDI	Control
QOG	Quality of governance (dummy)	QOG	Control

[1] The dataset used in this study is fully available upon request

WDI, QOG and GFD stand for world development indicators, quality of governance institute (university of Gothenburg, Sweden) and global financial development respectively Economic freedom measures the level of institutions within a country regarding freedom criteria. Freedom from corruption and freedom from expropriation (property rights), monetary freedom and trade freedom are some major determinants of EF according to QOG standard code book (2017). Quality of governance(QOG) in our data set is the average value of ICRG (international country risk guide institute) variables "corruption", "law and order" and "bureaucracy quality" each being scaled from 0 to 1 (higher values indicate higher quality) and then rounded to nearest integer. GCF (gross capital formation) is an indicator of domestic investment share in GDP. With GCF included in the matrix of control variables, variable x affecting the growth significantly is assumed to affect the growth via "level of efficiency". Including or ignoring this variable, our estimations are divided into two groups. If variable GCF is not included in the estimation, it is not clear whether the variable x affects growth via level of efficiency or investment (Niels Hermes and Robert Lensink, 2010). GFCE, General government final consumption expenditure (formerly general government consumption) includes all government current expenditures for purchases of goods and services (including compensation of employees). It also includes most expenditures on national defense and security, but excludes government military expenditures that are part of government capital formation.

LTRADE is calculated as logarithm of the sum of imports and exports divided to gross domestic product implying the level of trade openness and foreign relationships of a region. Regarding stock market parameters, LMCAP is logarithm of the sum of the capitalization of all listed firms in the country's stock market as a percentage of GDP, LVT indicates logarithm of total value of traded shares within the market divided to GDP and LTVR ratio is a measure for liquidity of the market calculated as logarithm of the ratio of traded shares to the total shares outstanding within the period (in our case, one year). Years of secondary schooling (SECYR) is included in the data set to take the level of human capital development into account, as the literature suggests. LPCGDP, being the GDP per capita reflects the process of catch up according to Niels Hermes and Robert Lensink (2010). LFDI is logarithm of the net foreign direct investments for a region including both inflows and outflows. Finally, INFLATION is the percentage change in GDP deflator

Figure1 shows the histogram for FDI net inflows as percentage of GDP while binding the thresholds to +50 and -50 in order to exclude some extreme observations in the chart. As it is obvious, roughly speaking, most of our observations on FDI inflows lie in the range of +30 and -10 percent, compared to local GDP. Negative values for FDI indicates higher outflows than inflows. We will later omit negative observations of FDI since we need logarithm of FDI values in our study.

figure 1

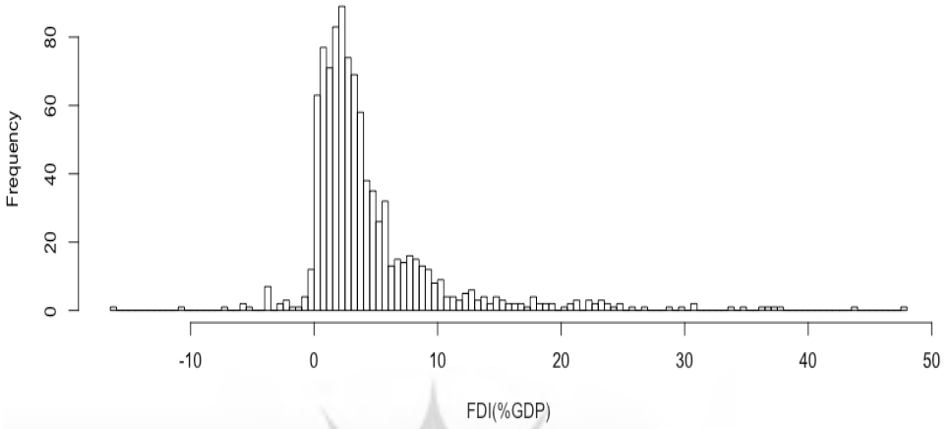

Figure1. The distribution of FDI. Most of the observations are within the range +30% and 10%. The figure reveals positive strong positive skewness for FDI.

our observations in FDI net inflow ranges between -58.32% for Luxembourg in 2007 and 451.72% for Malta again in 2007. All of the observations which could be regarded as outliers (less than -20% or higher than 200%) are from Malta and Luxembourg. Outside this range, observations seem to be smoothly distributed. We then omit these outliers from our panel data leaving us with 964 observations in 74 countries.

Table 2 presents, including the above-discussed outliers, the summary statistics of our variables of interest dividing our sample into three subsets; developed economies, developing economies and others.

Table 2. Summary statistics: main variables

	n	mean	s.d	median	min	max	skew	kurtosis
FDI (developed)	428	10.1298	37.4083	2.9154	-58.3229	451.7155	8.5031	82.0156
FDI (developing)	429	3.9234	4.9237	2.5884	-7.3598	43.9121	3.4478	17.0699
FDI (other)	140	5.7132	7.0573	4.3377	-16.0711	50.7415	3.6226	20.0965
MCAP	428	76.222	52.7	62.674	4.9017	265.128	1.337	1.7373

(developed)		0	152	0		2	6	
MCAP (developing)	429	54.8885	55.2034	36.2866	1.1646	259.6096	1.8132	3.0946
MCAP (other)	140	24.4376	19.9878	20.2581	0.1008	100.8311	1.4352	2.2289
VT (developed)	428	58.9589	57.4122	45.5577	0.0276	313.5934	1.2999	1.8478
VT (developing)	429	25.0147	40.6137	6.3215	0.0098	331.2711	2.9056	11.9771
VT (other)	140	8.4635	13.5910	2.1168	0.0015	76.1358	2.7239	8.3401
TVR (developed)	428	73.3869	58.4968	65.3425	0.0272	341.2363	1.2114	2.1413
TVR (developing)	429	41.1300	61.1092	17.4643	0.0426	494.2694	2.9063	11.2259
TVR (other)	140	24.9208	24.6687	13.2438	0.1835	118.4065	1.2263	1.0173

Note: FDI is the net foreign direct investment inflow towards a country. MCAP, VT, TVR are stock market variables standing for market capitalization, value traded and turnover ratio respectively.

In case of FDI we are also interested to check if the average varies significantly among different categories of countries. We run three Z-tests for the difference between the means of different categories and the result is reported in table3.

Table3. z-tests for difference in FDI average among country clusters

	Developed - developing	Developed - other	Developing - other	Developed - (developing and other)
z-score	3.4069***	1.3881	-3.3289***	-4.3684***

Note: the result for z-test with the Null hypothesis that the mean across different categories of countries is the same. The calculated z-scores are reported. *** stands for 0.01 level of significance.

Table3 shows, average foreign direct investment net inflow significantly varies when switching the sample from developed economies to the pooled sample of developing economies and other nations.

Methodology and research findings

FDI's effect on growth; the role of development

Our general model to investigate the hypothesis of the present study is specified as below:

$$GROWTH = \beta_0 + \gamma M + \mu C + \varepsilon \quad (1)$$

In the equation (1), M is the vector for the variables of interest in our study and C is the vector of generally accepted control variables discussed before. Our first question is whether FDI has any significant effect on growth which is tested using OLS and reported in table below. We also use Farra-Glauber test of multicollinearity and the value of standardized determinant is measured to be 0.3200 for the base regression which, regarding other outputs of the test, does not prove the hypothesis of multicollinearity and thus we ignore any further consideration of multicollinearity in our dataset. We also use White's estimates for standard errors of coefficients corrected for heteroskedasticity since the Breusch-pagan test for heteroskedasticity rejects homoskedasticity in our sample. We have used logarithm net FDI inflow as our main variable and since it can take negative values we omit observations with negative values for FDI net inflow which leaves us with 922 observations within 74 countries and 14 years (using lag values omits our observations in year 2000). Our regressions include time and country dummies to account for fixed effects of time and countries in our sample. Table 4 shows the result of model (2).

$$GROWTH_t = b_1 \text{Log (FDI)}_t + b_2 LEF_t + b_3 LGCF_t + b_4 INFLATION_t + b_5 SECYR_t + b_6 LGFCE_t + b_7 LTRADE_t + b_8 POPGROWTH_t + b_9 (GROWTH_{t-1}) + b_{10} QOG_t + \text{TIME DUMMIES} + \text{COUNTRY DUMMIES} + e_t \quad (2)$$

Table 4. relation between changes in per capita GDP (percent) and (log) net foreign direct investment inflow

	(1)	(2)	(3)	(4)
LFDI	0.5899748 *** (3.7187)	0.282314 ** (2.3313)	0.282314 ** (2.5546)	0.282314 ** (1.9665)
LEF		-10.081015 *** (-3.9464)	-10.081015 *** (-3.6703)	-10.081015 *** (3.6648)
LGCF		6.077945*** (5.4655)	6.077945*** (4.7512)	6.077945*** (-5.4002)
INFLATION		-0.042872 * (1.7010)	-0.042872 * (-1.7968)	-0.042872 ** (-2.1867)

SECYR		1.162384 * (1.9451)	1.162384 * (1.8020)	1.162384 (1.5435)
LGFCE		-5.800087 *** (-3.2509)	-5.800087 *** (-2.8325)	-5.800087 *** (-3.3330)
LTRADE		2.878481*** (3.4070)	2.878481*** (3.0553)	2.878481*** (2.9772)
POPGROWTH		-1.287426*** (-8.8142)	-1.287426*** (-7.5337)	-1.287426*** (-11.1756)
GROWTH $_{t-1}$		0.127040 **(2.3137)	0.127040 *** (3.1151)	0.127040*** (3.5963)
QOG		1.564152*** (3.3332)	1.564152*** (2.9789)	1.564152*** (3.3128)
Standard errors	White	White	CL-T	CL-C
Adjusted R2	0.6346	0.729	0.729	0.729

See notes to table1 for the definition of variables. The numbers in parenthesis are t-values. Columns (1) and (2) report the results for raw data while columns (3) and (4) take time fixed effects into account. Coefficients marked with *, ** and *** are significant at 10%, 5% and 1% level, respectively. The regressions include time and country dummies. Standard errors are reported using White's correction for heteroscedasticity and clustering by countries (CL-C).

From the results reported in table 4, we see that LFDI seems to effect the changes in per capita GDP positively and significantly when the only independent variable is LFDI inflows. As more explanatory variables are added to the regression this effect does not change implying that FDI has a positive and significant effect on growth. The coefficient estimates for all other explanatory variables are significant. The adjusted R2 ratio is calculated to be about 73% which is acceptable for our panel regression. As we discussed in the introduction section, this finding is not beyond our expectations and it is acceptable to deduce in this step that FDI in general affects growth significantly. What we aim to find out in the next step is if this effect changes across developed and non-developed countries. Now, we aim at finding the different characteristics of FDI under various sub-samples expecting to record different levels of effectiveness of FDI inflows when changing the sample from one sub-sample to another. As we discussed before, our sample includes variables observation in 30 developed economies, 33 developing economies and 11 countries which are not classified in either developed or developing category. Following the arguments in the literature review section, it is

expected that in countries with more developed infrastructure and financial development we can expect to record foreign direct investment inflows to be more effective in the process of growth but our hypothesis suggest that this effect must be lower or even insignificant in developed economies. We define a new dummy variable DEVELOPED which takes the value 1 for developed economies and 0 otherwise, then we run the regression below to see the change in FDI's behavior in presence of development:

$$\begin{aligned} Growth_t = {} & b_1 LFDI_t + b_2 DEVELOPED_t + b_3 LFDI_t \times \\ & DEVELOPED_t + b_4 LEF_t + b_5 LGCF_t + b_6 INFLATION_t \\ & + b_7 SECYR_t + b_8 LGFCE_t + b_9 LTRADE_t + b_{10} POPGROWTH_t \\ & + b_{11} (GROWTH_{t-1}) + b_{12} QOG_t + TIME\ DUMMIES + \\ & COUNTRY\ DUMMIES + e_t \end{aligned} \quad (3)$$

Table 5 confirms our hypothesis. FDI's effect on growth seems to have diminished in developed economies when interacted with DEVELOPMENT and put in the RHS of our regression as a separate independent variable since all the coefficients for the variable LFDI×DEVELOPED are significantly negative as reported in table 5.According to the last column of table 5, it seems that development is an important determinant of growth within an economy since adding variable DEVELOPMENT to our model results in significant coefficients for this new variable when clustering standard errors by country (CL-C). Developed countries seem to have higher rates of growth in nature, compared to non-developed economies. The issue of why this is the case is beyond the scope of this paper and we are more interested in the effects of foreign direct investment inflows on growth. The sign of the coefficient LFDI×DEVELOPED is surprisingly negative meaning that the effect of foreign inflows diminishes significantly in developed countries thus it is concluded that FDI's effect on growth in developed economies is significantly less than its effect in countries not classified as developed. The question that rises at this step is why this is the case? Discovering the reason for this finding needs deep arguments in macroeconomics but one potential explanation could be that although the absolute values of some development variables are higher in developed economies, some derivatives of the variables are important in process of technological diffusion like the growth rate of the variables which is expected to be higher in developing economies rather than developed countries. As we pointed out in the introduction section, the effect of FDI on economic growth takes place mostly through technology transfer and diffusion brought to the host by the foreign investors. In developed nations most of the technology diffusion process takes place indigenously and the level of technological development does not necessarily depend on the foreign inflow of knowledge and technology which can be considered as the main reason why FDI's positive impact on growth is less in developed nations than in non-developed economies.In table 6 we run regression (II) for two sub-samples

representing developed and non-developed economies to check the results obtained in table 5. The results presented in table 6 support our previous finding since the coefficient of LFDI is significantly higher in non-developed nations being about 0.63 while the coefficient for developed sub-sample was found to be about 0.07 and insignificant.

Table 5. relation between per capita GDP growth and (log) net foreign direct investment inflow in developed countries and other economies

	(1)	(2)	(3)	(4)	(5)
LFDI	0.5899748*** (3.7187)	1.060583*** (4.6868)	0.282314** (2.3313)	0.578010*** (2.9845)	0.578010** (2.4748)
DEVELOPED		0.412359 (0.9103)		2.217319 (1.3496)	2.217319** (2.1457)
LFDI × DEVELOPED		-0.893554*** (-3.4474)		-0.543675** (-2.5315)	-0.543675** (-2.2541)
LEF			-10.081015 *** (-3.9464)	-10.111783*** (-3.9557)	-10.111783*** (-3.6910)
LGCF			6.077945*** (5.4655)	5.863336*** (5.3047)	5.863336*** (5.4452)
INFLATION			-0.042872 * (-1.7010)	-0.045418 (-1.7815)	-0.045418** (-2.4255)
SECYR			1.162384* (1.9451)	1.185236** (1.9719)	1.185236 (1.6410)
LGFCE			-5.800087 ** (-3.2509)	-5.828075** (-3.3039)	5.828075*** (-3.4021)
LTRADE			2.87848*** (3.4070)	2.706688*** (3.2327)	2.706688*** (2.7921)
POPGROWTH			-1.287426*** (-8.8142)	-1.295564*** (-9.0324)	-1.295564*** (-11.9096)
$GROWTH_{t-1}$			0.127040 ** (2.3137)	0.123023** (2.2183)	0.123023*** (3.6429)
QOG_t			1.564152*** (3.3332)	1.470450*** (3.1189)	1.470450*** (3.1013)
Standard errors	White	White	White	White	CL-C
Adjusted R^2	0.6346	0.6404	0.729	0.7309	0.7309

Table 5 reports the result of regression analysis (3). For the definition of variables see the note to table 1. DEVELOPED is a dummy variable that takes

the value 1 for developed countries and 0 otherwise. Coefficients marked with *** are significant at 1% level. Numbers reported in parentheses are t-values. The regressions include time and country dummies. Standard errors are reported using White's correction for heteroscedasticity and clustering by countries (CL-C).

Table 6. relation between per capita GDP growth and (log) net foreign direct investment inflow in developed countries and other economies(Relation(2))

	developed	Non-developed
LFDI	0.0699 (0.7438)	0.6265 *** (2.5994)
LEF	-2.6828 (-0.9568)	-12.4696 *** (-4.2225)
LGCF	8.2588 *** (4.2515)	5.5896 *** (4.1488)
INFLATION	-0.109 ** (-2.316)	-0.0467 ** (-2.4126)
SECYR	0.6747 ** (2.0547)	1.8921 ** (2.2477)
LGFCE	-9.7043 ** (-2.5093)	-4.833 **(-2.5823)
LTRADE	6.0421 *** (3.1475)	1.2722 (1.156)
POPGROWTH	-1.4424 *** (-4.978)	-1.4067 *** (-11.1529)
GROWTH t-1	0.1701 *** (3.1264)	0.0822 ** (2.2446)
QOG	0.8976 ** (2.1939)	1.3118 *** (2.6748)
Standard errors	CL-C	CL-C
Adjusted R2	0.8125	0.7166

Note: The numbers in parenthesis are t-values. Columns (1) and (2) report the results for raw data while columns (3) and (4) take time fixed effects into account. Coefficients marked with *, ** and *** are significant at 10%, 5% and 1% level, respectively. The regressions include time and country dummies. Standard errors are reported using White's correction for heteroscedasticity and clustering by countries (CL-C).

The role of financial absorptive capacities

As argued in the previous sections, some pre-conditions have been introduced in the literature which are needed as infrastructures so that FDI can affect growth. Up to now some financial and non-financial pre-conditions have been measured and reported in literature referred to as the absorptive capacity of the recipient region. In case of financial absorptive capacities, the main focus of prior researches has mostly been the money market and banking system and stock market development is of the less explored areas which is why we are interested in exploring the effect of stock market development on the

significance of FDI inflows effect on growth. Building on the findings discussed in the literature review we would expect that in economies with more developed and agile stock markets foreign investment inflows can affect growth positively and significantly. it is expected that these significant effects must be negative in developed regimes. We therefore define STOCK as the variable representing the development of the stock market and use the model (4) to test our hypothesis:

$$\begin{aligned}\text{Per capita GDP growth} &= b_1 \text{LFDI}_t + b_2 \text{STOCK}_t \\ &+ b_3 \text{LFDI}_t \times \text{STOCK}_t + b_4 \text{LEF}_t + b_5 \text{LGCF}_t \\ &+ b_6 \text{INFLATION}_t + b_7 \text{SECYR}_t + b_8 \text{LGFCE}_t \\ &+ b_9 \text{LTRADE}_t + b_{10} \text{POPGROWTH}_t \\ &+ b_{11} (\text{GROWTH}_{t-1}) + b_{12} \text{QOG}_t + \text{TIME DUMMIES} \\ &+ \text{COUNTRY DUMMIES} + e_t\end{aligned} \quad (4)$$

We, at this step, in consistence with other studies in literature, use three different measures of stock market development and put in the RHS of our model in order to test whether the effect of FDI changes in presence of desirable stock-market-related absorptive capacity. Our stock market variables are, as defined in table 1, logarithm of stock market capitalization (LMCAP), logarithm of total value of stocks traded within a given period of time –one year in our case- divided to GDP (LVT) and the logarithm of the turnover ratio of the market (LTVR). The results of our test for model (4) is reported in table 8. prior to testing for the main equation, we test whether the average of our stock market variables are different across different subsets of our samples -i.e. developed and non-developed economies. The z-scores of this test is reported in table 7 bellow. The calculated z-scores confirm the assumption that the means of stock market development indices used in this study are significantly different in developed and non-developed economies being higher in developed economies.

Table7. mean of the stock market variables in developed vs non-developed countries

variable	**MCAP**	**LMCAP**	**VT**	**LVT**	**TVR**	**LTVR**
z-score	7.2185***	10.5307***	11.4272***	12.7458***	9.5047***	9.7391***

All null hypotheses are rejected with 1% significance marked with ***. Variables MCAP, VT and TVR are absolute values of stock market capitalization divided to GDP, value of traded stocks divided to GDP and the turnover ratio of the stock market, respectively.

Table8. the effect of stock market development (regression of equation (4))

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
LFDI	0.589974 8 *** (3.7187)	1.221949 ** (2.4462)	1.221949 ** (2.0918)	0.653762 *** (2.9434)	0.653762 *** (2.9434)	0.903004 *** (3.0135)	0.903004 ** (2.4526)
LMCAP		0.399204 (1.3516)	0.399204 (1.1461)				
LFDI×LMCAP		-0.260839 ** (-2.1018)	-0.260839 * (-1.7693)				
LVT				0.305329 * (1.6657)	0.305329 * (1.6657)		
LFDI×LVT				-0.162281 ** (-2.5606)	-0.162281 ** (-2.5606)		
LTVR						0.583882 ** (2.4826)	0.583882 * (1.8087)
LFDI×LTVR						-0.193085 ** (-2.5539)	-0.193085 ** (-2.1208)
LEF		-10.22017 *** (-3.9835)	-10.2201 *** (-3.5601)	-10.3102 *** (-4.0208)	-10.3102 *** (-4.0208)	-9.8988 *** (-3.8036)	-9.8988 *** (-3.3003)
LGCF		5.961184 *** (5.0864)	5.961184 *** (5.3367)	5.741696 *** (4.8860)	5.741696 *** (4.8860)	5.825534 *** (5.2824)	-5.8255*** (5.2904)
INFLATION		-0.043180 * (-1.7036)	-0.04318 ** (-2.2759)	-0.043375 * (-1.7146)	-0.043375 * (-1.7146)	-0.042280 * (-1.6851)	-0.042280 ** (-2.1176)
SECYR		1.145742 * (1.9338)	1.145742 (1.5332)	1.058946 * (1.7883)	1.058946 * (1.7883)	1.074927 * (1.8128)	1.074927 (1.4052)
LGFCE		-5.9596 *** (-3.3912)	-5.9596 *** (-3.5099)	-5.8047 *** (-3.3269)	-5.8047 *** (-3.3269)	-5.6331 *** (-3.2104)	-5.6331 *** (-3.3420)

LTRADE		2.985639*** (3.5351)	2.985639*** (3.1616)	2.933818*** (3.5349)	2.933818*** (3.5349)	2.820885*** (3.4268)	2.820885*** (3.1139)
POPGROWTH		-1.28492*** (-8.7919)	-1.2849*** (-11.6602)	-1.2832*** (-8.7697)	-1.2832*** (-8.7697)	-1.2730*** (-8.4820)	-1.2730*** (-11.6727)
$GROWTH_{t-1}$		0.122706** (2.2165)	0.122706*** (3.6612)	0.124130** (2.2394)	0.124130** (2.2394)	0.128465** (2.3462)	0.128465*** (3.7610)
QOG_t		1.472618*** (3.1528)	1.472618*** (3.1351)	1.477673*** (3.1641)	1.477673*** (3.1641)	1.509616*** (3.2659)	1.509616*** (3.3760)
Standard errors	White	White	CL-C	White	CL-C	White	CL-C
Adjusted R^2	0.6346	0.7304	0.7304	0.7317	0.7317	0.7325	0.7325

Note : Coefficients marked with *, ** and *** are significant at 10%, 5% and 1%, respectively. LFDI×LMCAP, LFDI×LTVR and LFDI×LVT are interaction terms of LFDI with variables LMCAP, LTVR and LVT, respectively. Numbers reported in parentheses are t-values. The regressions include time and country dummies. Standard errors are reported using White's correction for heteroscedasticity and clustering by countries (CL-C).

The results reported in table above combined with the assumption that the average of stock market variables used in our study are significantly higher in developed economies confirm our findings in table5. For the variables LVT, LTVR, and LMCAP the coefficients of the variables LFDI*LVT, LFDI*LVTR, and LMCAP*LFDI are all significantly negative which reiterates our finding in table5 that the effect of foreign investment inflows on changes in GDP per capita is significantly lower in developed economies. Now what are the critical values for each financial variable above which we can expect FDI's effect on growth to diminish? We call these threshold values cut-off estimates and calculate their estimated values in the following section.

Detecting cut-off levels

According to our findings in table 9, FDI affects changes in per capita GDP less in high levels of stock market development. We now try to find a threshold value for each indicator of market development and report as our sample-splitting estimate.We use the procedure also used by Azman-Saini et.al.(2010) to detect these thresholds. The model we define for our threshold specification

is specified as follows:

$$GROWTH = \begin{cases} \beta 1 + \gamma 1\ \text{LFDI} + \mu 1\ \text{CONTROL} + \varepsilon 1 & \text{FIN} > y \\ \beta 2 + \gamma 2\ \text{LFDI} + \mu 2\ \text{CONTROL} + \varepsilon 2 & \text{FIN} \leq y \end{cases} \quad (5)$$

Model(5) assumes that the coefficients of our independent variables differ for the sub-samples separated by the threshold value y – i.e. there is a structural change in our model when the parameter FIN, representing stock market indicators, reaches y. we utilize an iterative procedure, grow y step by step, split our sample to above and below the threshold and run two separate regressions for the two sub-samples implied by the threshold value. The threshold value which minimizes the residual sum of squares is recognized as our threshold estimate. Table9 below reports the results of our analysis utilizing LMCAP, LVT and LTVR as indicators of stock market development and thus implemented in the above equation as FIN.We also run Chow test in order to test for the significance of the sample splitting process and the numbers reported in the table as chow statistics imply that all of the estimates for threshold values split the sample effectively and the structural change in sample behavior is significant among different sub-samples since all the chow statistics are significant at 1% level. All of our stock market indicators produce the desired result since the effect of LFDI dramatically decreases as we switch to our high-FIN sub-sample.

Though table 9 introduce significant turns in sample behavior discovered through minimizing the residual sum of squares, our main focus is explaining the behavior of FDI inflows in different conditions and we are not interested in characteristics of other explanatory variables in our sample. On the other hand, although the estimates reported in tables 9 are acceptable measures but they are not necessarily the best thresholds to split the sample in order to explain FDI behavior. We need another model to estimate the threshold values of stock market indicators which can also be considered as robustness check for our estimates of threshold values. As the second approach to finding the desired threshold level we introduce a new model specified as:

$$\begin{aligned} \text{GROWTH} &= b_1\ \text{LFDI}_t + b_2\ \text{LFDI}_t \times \text{THRESHOLD}_t \\ &+ b_3 \text{LEF}_t + b_4\ \text{LGCF}_t + b_5\ \text{INFLATION} \\ &_t + b_6\ \text{SECYR}_t + b_7\ \text{LGFCE}_t + b_8\ \text{LTRADE}_t \\ &+ b_9\ \text{POPGROWTH}_t + b_{10}\ (\text{GROWTH}_{t-1}) \\ &+ b_{11}\ \text{QOG}_t + \text{TIME DUMMIES} + e_t \end{aligned} \quad (6)$$

Table9. threshold regression with stock market indicators as threshold variables

	LMCAP		LVT		LTVR	
	FIN<y	FIN>y	FIN<y	FIN>y	FIN<y	FIN>y
LFDI	0.852 *** (3.2143)	0.2796 *** (3.3074)	0.5297 * (1.9529)	0.2508 *** (3.3311)	0.5327 ** (2.0974)	0.3029 *** (3.6685)
LEF	-5.9171 *** (-2.7775)	-3.0011 *** (-2.8085)	-6.9894 *** (-3.9914)	-2.1177 ** (-1.9956)	-5.9961 ** (-2.5723)	-3.3593 *** (-3.0706)
LGCF	0.1717 (0.1427)	3.014 *** (6.6907)	3.0401 *** (5.0231)	1.8439 ** (2.4313)	3.0604 *** (4.727)	1.7942 ** (2.2425)
INFLATION	-0.0473 ** (-2.1328)	-0.0152 (-0.3979)	-0.0595 *** (-3.2579)	-0.0131 (-0.3684)	-0.0771 ** (-2.3378)	-0.002 (-0.088)
SECYR	0.0878 (0.3409)	-0.141 (-1.1027)	0.2666 (1.1803)	-0.1564 * (-1.659)	0.2655 (0.9359)	-0.1791 * (-1.8777)
LGFCE	-3.9391 *** (-3.0631)	-2.2171*** (-4.4102)	-5.378 *** (-3.4827)	-1.8073*** (-4.2077)	-5.6376 *** (-4.1819)	-1.7944 *** (-4.2178)
LTRADE	1.531 *** (3.0865)	0.0473 (0.2879)	0.3402 (0.6424)	-0.004 (-0.0268)	0.2068 (0.4503)	0.1815 (1.1943)
POPGROWTH	-0.3538 (-1.1614)	-0.6777 *** (-5.6745)	-0.7244 *** (-2.7823)	-0.5611 *** (-4.8465)	-0.617 ** (-2.1117)	-0.6263 *** (-6.4266)
GROWTH t-1	0.4117 *** (4.8762)	0.308 *** (5.0049)	0.2287 *** (5.0114)	0.4597 *** (7.1773)	0.2317 *** (3.9409)	0.4256*** (7.4328)
QOG t	0.1815 (0.3464)	-0.4175 (-1.2268)	-0.2117 (-0.4986)	-0.0743 (-0.261)	-0.3671 (-0.6203)	-0.0268 (-0.1052)
reshold estimate	2.8353		0.7261		2.4724	
LOW-FIN Countries	14		23		25	
HIGH_FIN Countries	60		51		49	
Chow statistic	4.8369***		3.9669***		3.4384***	
Standard errors	CL-C	CL-C	CL-C	CL-C	CL-C	CL-C
Adjusted R^2	0.6511	0.7367	0.6774	0.7193	0.655	0.7331

Note : the result of the regression of equation (II) While splitting our sample according to the threshold value of our stock market variables of interest. Coefficients marked with *, ** and *** are significant at 10%, 5% and 1%, respectively. The regressions include time dummies. Standard errors are reported using White's correction for heteroscedasticity and clustering by countries (CL-C).

In which THRESHOLD is a dummy variable taking the value1 for observations with indicators higher than the threshold level and 0 otherwise. In order to find the proper threshold level for each stock market variable, we iteratively change the indicator value and each time run a separate regression for each sub-sample implied by the threshold. The value for which the RSS of the regression is minimized is reported as the threshold value of the indicator. Table 10 includes the result of our analysis in this regard. The results reported in table 10 are much like what we had seen in tables 9. The variable LFDI×THRESHOLD has negatively significant coefficients for all of our financial variables which means that FDI's effect on growth is lower for the observations with financial variables above the estimated threshold value.

Table10.Result of regression of equation (6)

	LMCAP	LVT	LTVR
LFDI	1.152757***(4.7540)	0.828797*** (3.7762)	0.606115**(2.4773)
LFDI×THRESHOLD	-0.891493***(-3.8806)	-0.551504 ***(-2.9019)	-0.285352 (-1.2557)
THRESHOLD	0.347262 (1.0331)	0.297190 (0.8520)	0.724201 (1.6036)
LEF	-3.736074*** (-3.3843)	-3.603383 *** (-3.0583)	-3.799135 ***(-3.1954)
LGCF	2.216430***(3.3073)	2.325985***(3.2887)	2.278118(3.3608)
INFLATION	-0.037153**(-2.0039)	-0.031729*(-1.6979)	-0.027582(-1.4451)
SECYR	0.136050(-1.2592)	-0.128122(-1.2174)	-0.081039(-0.7143)
LGFCE	-2.470030***(-4.4920)	-2.534598 ***(-4.4067)	-2.603052 ***(-4.4758)
LTRADE	0.166816(1.0943)	0.073137(0.4345)	0.197694(1.3041)

POPGROWTH	-0.621840***(-4.9822)	-0.646623***(-5.4825)	-0.657321***(-5.5095)
GROWTH t-1	0.328850 ***(8.5228)	0.334600 ***(8.7208)	0.341720 ***(8.5597)
QOG t	-0.330389(-1.2955)	-0.295622(-1.1088)	-0.428117(-1.5547)
reshold estimate	2.626	0.0856	2.1975
LOW-FIN Countries	10	15	21
HIGH_FIN Countries	64	59	53
Standard errors	CL-C	CL-C	CL-C
Adjusted R^2	0.6878	0.6842	0.6825

Note .t- values are reported in parenthesis and Coefficients marked with *, ** and *** are significant at 10%, 5% and 1%, respectively. The regressions include time dummies. Standard errors are reported using White's correction for heteroscedasticity and clustering by countries (CL-C).

Now, with the findings reported in tables 9 and 10, we have two estimates for the threshold level regarding each stock market variable. These estimates are summarized in table 11 bellow. Table 12 presents the financially-developed countries included in our dataset based on these threshold estimates. We consider the higher of the two estimates for each variable and the selected countries are the ones which exceed the threshold for all the three stock market variables.

Table 11. threshold estimates for stock market variables

	LMCAP	LVT	LTVR
reshold (I)	2.8353	0.7261	2.4724
reshold (II)	2.626	0.0856	2.1975

Note: the estimated threshold values for stock market indicators. Threshold (I) and Threshold(II) correspond to estimates derived from equations (5) and (6), respectively.

Summary and conclusion

Studies investigating the relation between foreign direct investment and economic growth of the recipient country report that in more financially and institutionally developed hosts, FDI is more likely to affect growth since these pre-conditions improve the probability of successful technology transfer and diffusion which is considered to be the main channel through which FDI affects economic growth. Our main contribution in this paper is that we challenge this consensus. Our first hypothesis is that among developed nations, it should not be the technology transfer which fosters economic growth since most of the technology is produced and diffused internally rather than imported by foreign investors. Hence, the effect FDI has on economic growth of the host must diminish as the recipient becomes more developed if we assume that the only way FDI can affect growth is through technology and knowledge transfer. Our data supports this hypothesis.

Considering parameters of stock market development we showed that FDI's effect on growth is significantly lower in presence of higher levels of stock market development which is in line with our previous findings and is viewed as our next contribution to literature which is in contradiction with what the literature previously suggests. We then derive critical values for each stock market variable, called threshold estimates, which split our sample into two groups of observations and we show that the effect of FDI on growth is significantly lower in the group with higher values of the financial variable.

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