THE ROLE OF CHANNELS THROUGH WHICH FOREIGN DIRECT INVESTMENT INFLUENCES ECONOMIC GROWTH

Doğrudan Yabancı Yatırımların Ekonomik Büyümeyi Etkilediği Kanalların Rolü

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ABSTRACT

Numerous studies have tried to reveal benefits of foreign direct investment (FDI) on economic growth. However, different empirical results have been culminated due to abilities of host countries. In this study, it is aimed to examine whether capabilities of host countries such as financial development, trade openness and human capital (also known as absorptive capacity indicators) can enable host countries to exploit FDI more. Empirical findings, using five-year averaged panel data between 1960 and 2016, show that FDI alone contributes on economic growth positively and more than domestic investment. However, especially in developing countries, trade openness and human capital are more effective than financial development on benefiting from FDI. Results also show that for developing countries, financial development has a threshold level and countries can benefit from the positive effects of FDI when this level is exceeded.

ÖZ

Birçok çalışma, doğrudan yabancı yatırımların (DYY) ekonomik büyüme üzerine faydalarını ortaya koymaya çalışmıştır. Ancak, ev sahibi ülkelerin yatırım çekme kabiliyetlerinden dolayı farklı ampirik sonuçlar neticelenmiştir. Bu çalışmada, ev sahibi ülkelerin (massetme kapasitesi göstergeleri olarak da bilinen) finansal gelişmişlik, ticaret serbestliği ve beşerî sermaye gibi kabiliyetlerinin, bu ülkelerin DYY'den daha fazla faydalanmalarına olanak sağlayıp sağlayamadığını araştırmak amaçlanmıştır. 1960 – 2016 yılları arasında 5-yıl ortalamalı panel verinin kullanıldığı ampirik bulgular, DYY'nin tek başına büyüme üzerine pozitif ve yerel yatırımlardan daha fazla katkı yaptığını göstermektedir. Ancak, özellikle gelişmekte olan ülkelerde, ticari serbestlik ve beşerî sermaye, DYY'den faydalanmada finansal gelişmişlikten daha etkili bulunmuştur. Sonuçlar ayrıca, gelişmekte olan ülkeler için finansal gelişmişliğin bir eşik seviyesine sahip olduğunu ve bu seviyenin geçildiği zaman ülkelerin DYY'den pozitif şekilde faydalanabileceklerini göstermektedir.

1. INTRODUCTION

Foreign direct investment (FDI) is an investment made by a company operating its production or acquiring an existing manufacturing plant in abroad. Developing countries enhance their growth rates by both clearing their saving gaps and transferring technology via FDI accelerated by globalization especially after the 1990s (Köprücü, 2017: 106).

Economic growth and composition of it have occupied an important place in the past years particularly in developing countries. Among these determinants investment (both domestic and foreign) is thought that it accelerates economic growth (Pekgas, 2015: 124).

Because of weak human and physical capital and poor technological knowhow, developing countries are generally not capable of benefiting from their natural resources. Hence, international sources of growth like development aid, portfolio flows, and foreign investment may make these countries enable to utilize their sources. In comparison with other international sources, FDI may be more advantageous, since it provides the host country with a relatively more stable flow of funds, helps capacity augmentation, and increases employment and trade. It is also believed that FDI produces externalities in the form of technology transfers and spillovers and it may ease the transfer of technological and business knowhow to host countries. Thus, foreign investment may raise the

productivity of all firms via transfers that may have substantial spillover effects for the entire economy (Zhao and Du, 2007: 71; Iamsiraroj and Ulubaşoğlu, 2015: 200; Carkovic and Levine, 2002: 1).

Theoretical explanations such as industrial organization theory, international trade theory and endogenous growth theory exist. Industrial organization theory explains the effects of technology and knowledge transfer on market structure and competition while international trade theory expresses why FDI and international trade occur by examining choices of firms. In terms of endogenous growth theory, FDI is considered as an important source of advanced human capital and positive spillover effects across countries (Yao, 2006: 340). Therefore, the role of FDI in the growth process has taken part in vast studies intensively. Even though FDI is considered as a good through which new ideas, advanced techniques, technology and skills are transferred across countries, the debate on the relationship of FDI and growth provides contradicting predictions, as well. A large literature that analyses the effect of FDI on growth is available. (Kottaridi and Stengos, 2010: 858).

Although majority of the studies in the literature refer positive effect of FDI on economic growth there are papers representing weak, null or negative effect of FDI (Almfraji and Almsafir, 2014: 208-209). Absorptive capacities of host countries may result in these differences in the results since positive effects of FDI may be valid when abilities such as a free trade policy, export-oriented FDI policy and human capital development are available (Sunde, 2017: 434).

Although FDI is seemed that it can transfer greater technology and knowledge spillovers, capacities of host countries to capture these externalities might be limited by individual conditions. In an examination of the effects of FDI on economic growth, other factors affecting growth should be considered as well. Other factors can limit the economy's ability to absorb beneficial FDI spillovers (Alfaro et al., 2004: 91).

Thus, that how FDI enhances growth may be explained in two ways: First, FDI increases total investment by attracting higher levels of domestic investment directly. Other way it works: Advanced technology and high level of human capital in host country may enable FDI to be more productive than domestic investment (Ewe-Ghee, 2001: 3; Pekgas, 2015: 125). For instance, FDI creates potential spillovers of knowledge to the local labor force. However, skills of existing labor force cannot benefit from these substantial spillovers. Hence, human capital in the host country designates the amount of foreign investment and potential benefits to be absorbed by local firms (Adefabi, 2011: 32).

Growth effects of FDI have great importance to understand. So, in this paper, it is aimed to assess effects of FDI on growth. However, abilities of the host countries are much more deliberated. Therefore, rather than direct impact of FDI, channels such as human capital, trade openness and financial development which are thought attract FDI are aimed to analyze due to the fact that presence of simultaneous effects of FDI and these abilities of the host countries on economic growth is clear.

2. LITERATURE REVIEW

Either neo-classical growth models or endogenous growth models may be basis for empirical studies on the relationship between FDI and economic growth. In neoclassical growth models, FDI leads to long-term level effects and medium-term, transitional increments in growth by enhancing the volume and efficiency of investment. The endogenous growth models ponder long run growth as a function of technological progress. In the framework which these models account for, FDI may increase the growth of host economy through technology transfer and spillover effects (Nair-Reichert and Weinhold, 2001: 154). Studies in the existing empirical literature conduct several tests, using single time series or panel data. Nevertheless, a clear result on the connection between FDI and economic growth cannot be found out. In this section, studies from a wide literature exploring the link between FDI and growth are reviewed.

Yao, (2006) examines the effect of exports and FDI on economic performance of China, using a panel data between 1978 and 2000. Results show that both exports and FDI influence economic growth positively.

Another study investigating whether FDI and exports cause to economic growth is carried out by Sunde, (2017) for South Africa. It is confirmed that economic growth, FDI and exports are cointegrated. Moreover, he finds that causality between economic growth and foreign direct investment is unidirectional from foreign direct investment to economic growth.

Köprücü, (2017) analyzes long term relationship between FDI and economic growth for Turkey. By utilizing annual data between 1981 and 2013, he finds that FDI and growth are cointegrated. Also, in his study, causality between FDI and technology spillover (proxied by patent citations of nonresidents) is confirmed in Turkey.

In another study analyzing cointegration, Pegkas, (2015) examines the relationship between the foreign direct investments and economic growth and then estimates the effect of foreign direct investments on economic growth in the Eurozone countries over the period of 2002–2012. The empirical analysis reveals that there is a positive long-run cointegrating relationship between FDI stock and economic growth. Pekgas' findings also indicate that the stock of FDI is a significant factor leading positively economic growth in the Eurozone countries.

Abbes et al., (2015) analyze the link between foreign direct investment and economic growth in selected countries, using panel cointegration and causality tests. Their findings display a contradiction for the cointegration. The results, however, imply that a unidirectional causality from FDI to Gross Domestic Product.

Instead of analyzing direct effect or conducting causality or cointegration tests, there are also studies examining host countries' abilities and FDI simultaneously. For instance, Borensztein et al., (1998) test the influence of foreign direct investment on economic growth. Their findings imply that FDI is a substantial tool in term of technology transfer. Furthermore, its contribution to growth is more than that of domestic investment. However, a threshold level exists for human capital and the higher productivity of FDI occurs only when the host country exceeds this threshold level human capital. Therefore, once host country has an adequate absorptive ability contribution of FDI to economic growth is substantiated.

Tang and Zhang, (2016) test the effects of absorptive capacity and FDI interaction on China's manufacturing exports using the data of manufacturing sectors for 31 regions over the period 2005–2012. They find that absorptive capacity is necessary condition for China to benefit from FDI in manufacturing exports, and FDI alone contributes to manufacturing exports in a limited way. In addition, research and development (R&D) and human capital seem to be more functional for China to acquire spillovers spreading from FDI.

Alfaro et al., (2004) explore the connections among FDI, financial markets, and economic growth. They investigate whether countries having well developed financial systems can utilize FDI more efficiently, by employing cross-country data over the period 1975 – 1995. Empirical results show that FDI alone contributes to economic growth questionably. However, countries with well-developed financial markets exploit FDI significantly.

Similarly, Azman-Saini et al., (2010) present evidence on the role financial market developments play in mediating the impact of FDI on growth, employing data from 91 countries between 1975 and 2005. They find that positive effect FDI on growth exists only when financial market development exceeds a threshold level. Until then, the benefit of FDI does not exist.

Cleeve et al., (2015) investigate the role of human capital on FDI inflows to sub-Saharan Africa using panel data for the period 1980–2012. The results of their study show that all measures of human capital have a significant influence on FDI. However, evidence on the increasing importance of human capital on FDI over time cannot be confirmed.

In terms of institutions and governance, Bokpin, (2017) reveals that FDI has a positive impact on environmental sustainability if there is a strong governance and quality institutions allowing to check the conduct of businesses which are financed by the FDI flows. The study provides governance and institutional policy prescriptions towards decreasing the negative impact of FDI flows on environmental sustainability.

Since a vast literature is available meta regression analyses are also conducted. One of these kinds of study was conducted by Iamsiraroj and Ulubaşoğlu, (2015). They explore the global relationship between FDI and growth through meta regression analysis which is consisted of 880 estimations reported in 108 published studies. Their investigation, utilizing a sample being consisted of 140 countries in the period 1970 to 2009, shows that FDI influences economic growth positively.

However, there have been studies revealing no connection or negative relationship existence between FDI and growth. Carkovic and Levine, (2002) finds that the exogenous component of FDI does not produce a positive influence on economic growth. According to their findings, empirical evidence supporting the argument that FDI accelerates economic growth is not reliable.

Khaliq and Noy, (2007) investigate the effect of FDI on economic growth in different economic sectors in Indonesia by employing FDI inflows data covering the period 1997-2006. They find the beneficial impact of FDI does not exist when they account for the different average growth performance across sectors. They also report that the impact of FDI inflows is negative in mining and quarrying sector.

Katerina et al., (2004) investigate the existence and the nature of the effect of FDI on the rate of growth across economies in transition. They apply Bayesian analysis on selected countries. Their findings assert that there is not any significant relationship between FDI and economic growth for the sample they analyze.

3. Data, Methodology and Sources

In this part of the study, data and econometric models used in the empirical analysis are introduced. Panel data estimations are conducted since different individuals exist in the same time period.

3.1. Panel Data

Data which are formed by both time series and cross-sectional data is called as panel data. A simple panel data model can be expressed with the following equation:

$$y_{it} = \beta_0 + \beta_1 x_{it} + \varepsilon_{it} \tag{1}$$

where i represents individual dimension and t represents time dimension, y_{it} is dependent variable, x_{it} is explanatory variable, β_0 is intercept term, β_1 is parameter to be estimated and ε_{it} is error term.

Panel data may be more advantageous than time series or cross sectional data. Panel data allow individual dimension to be heterogeneous and by this way individual differences can be captured in the model (Koç and Sarısoy, 2012:198). Panel data models can be analyzed as either fixed effects model or random effects model, depending on whether it keeps individual effects or not.

3.1.1. The Fixed Effects Model

Equation (1) can be displayed by decomposing error term into individual specific effect and residual that includes unexplained part of dependent variable.

$$y_{it} = \beta_0 + \beta_1 x_{it} + \alpha_i + u_{it} \tag{2}$$

where α_i is individual specific effect which implies differences across groups and does not vary over time. u_{it} is the error term and $\varepsilon_{it} = \alpha_i + u_{it}$.

In this model, α_i is treated as unknown parameter to be estimated. However, it is captured in the constant term (Greene, 2011:359).

3.1.2. The Random Effects Model

In the fixed effects model, unobserved individual effects are allowed to be correlated with the included variables. In such cases in which individual effects are strictly uncorrelated with the explanatory variables, modelling the individual specific constant terms as randomly distributed across cross-sectional units may be appropriate. Hence, the model takes the form of

$$y_{it} = \beta_0 + \beta_1 x_{it} + v_{it}, \qquad v_{it} = \alpha_i + u_{it}. \tag{3}$$

However, the number of parameters to be estimated decreases in this model (Greene, 2011:371).

3.1.3. Actual Model and Data

To understand the effect of FDI on growth the following benchmark model is estimated.

$$Y_{it} = \beta_0 + \beta_1 FDI_{it} + \theta X_{it} + \alpha_i + \varepsilon_{it} \tag{4}$$

where for country i and time t, Y represents growth of real GDP per capita, FDI stands for the net FDI flows over GDP of host country, X is control variables matrix, α is country specific effect and ε is the error term. The control variable matrix X is consisted of financial development, trade openness, government expenditure, inflation, secondary schooling as human capital, and domestic investment.

Financial development is proxied by domestic credit to the private sector (Iamsiraroj and Ulubaşoğlu, 2015) and broad money supply (Al-Sadig, 2013). So both proxies are used in this study to get accurate results.

Direct effect of FDI on growth is given by $\frac{\partial growth}{\partial FDI} = \beta_1$ and this effect is expected to be greater than zero.

Data used in this study, their descriptions and sources are reported in Table 1.

Table 1. Descriptions of Variables

Variable name	Variable Description
Growth	Real GDP per capita growth (%)
FDI	Net FDI inflows as a percentage of host country GDP
Investment	Gross domestic investment as a percentage of GDP
Secondary schooling	Net rate of secondary school enrolment
Inflation	Annual growth rate of the GDP deflator
Government expenditure	General government final consumption expenditure as a percentage to GDP.
Trade openness	The sum of exports and imports of goods and services measured as a percentage of GDP.
Financial development	Domestic credit to the private sector as a percentage to GDP. Broad money supply as a percentage to GDP.

Source: https://data.worldbank.org/

Summary statistics of these variables and other control variables are provided in Table 2.

Table 2. Summary Statistics of Variables

Variable	Mean	Standard deviation	Minimum	Maximum
Real GDP per capita growth	2.059177	6.168938	-64.99631	140.5011
FDI	3.80395	13.41575	-82.8921	466.5622
Domestic credit to the private sector	41.28884	221.6277	0.0008229	13956.76
Broad money supply	50.38455	309.322	0.267337	18347.09
Government expenditure	16.05222	7.730284	1.375188	156.5315
Investment	23.28952	10.42663	-5.739738	219.0694
Inflation	32.32328	429.0304	-98.70383	26762.02
Secondary schooling	69.63585	24.82738	2.68421	100
Openness	79.03291	53.60474	0.0209992	860.8

Source: Author's own computation.

In this paper, trade openness, financial development and human capital are treated as absorptive capacities. Positive correlation between FDI and these abilities can be seen in Table 3 in which correlation matrix of variables are represented.

Countries being open to international trade are more likely to attract foreign technology and spillover that may improve productivity of local firms. By this way, trade openness may help countries at benefiting from FDI more (Lesher and Miroudot, 2008: 21).

In order to benefit from substantial foreign technology, firms in host countries should have access to financing so that they can fulfill the new technology in their production processes. Thus, countries with a sophisticated financial system are more likely to have spillovers effects evolving from foreign investment (Irsova and Havranek, 2013: 5).

Even though there are such cases that foreign investors train local labor force, human capital development is essential in the transmission of technological knowledge and spillover from foreign investment to domestic firms (Narula and Marin, 2003: 7).

Due to these potential effects of absorptive capacities FDI is thought that it affects growth through these abilities, as well.

Table 3. Correlation Matrix of Selected Variables

	GDP per capita Growth	FDI	Domestic credit	Broad MS	Openness	Sec. schooling
GDP per capita Growth	1					
FDI	0.231***	1				
Domestic credit	-0.136***	0.101***	1			
Broad MS	-0.0543	0.240***	0.443***	1		
Openness	0.156***	0.483***	0.183***	0.309***	1	
Sec. schooling	-0.0272	0.0415	0.525***	0.274***	0.124***	1

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.
Source: Author's own computation

The objective of this study is to reveal the channels through which FDI affects economic growth. Durham (2004) and Mingyong et al. (2006), added multiplication of FDI and absorptive capacity which they analyzed in order to examine simultaneous effect of FDI and related absorptive capacity variable. So to see the simultaneous effect of absorptive capacities (AC) and FDI, benchmark model is extended to the following equation by adding interaction terms.

$$Y_{it} = \beta_0 + \beta_1 FDI_{it} + \gamma_1 AC_{it} + \gamma_2 AC_{it} * FDI_{it} + \theta X_{it} + \alpha_i + \varepsilon_{it} \qquad (5)$$

where for country i and time t, Y displays growth of real GDP per capita, FDI stands for the net FDI flows over GDP of host country, AC is a matrix of absorptive capacity, X is the matrix of other control variables, α is country specific effect and ε is the error term.

AC includes financial development, trade openness and secondary schooling as human capital while the control variable matrix X is consisted of government expenditure, inflation and domestic investment.

In this case, effect of FDI on growth is given by $\frac{\partial growth}{\partial FDI} = \beta_1 + \sum_{i=1}^{n} \gamma_i AC_i$ where i=1, 2, …, n and n is the number of variables used as absorptive capacity.

World Economic Situation and Prospects classifies countries as developed economies, economies in transition and developing economies (WESP, 2014). Thus, by employing the data over the period 1960-2016, model 4 and 5 are estimated for all, developing, developed and transition countries respectively to see the different impact of FDI on different type of country groups.

4. EMPIRICAL RESULTS

Estimation results report only fixed effects regressions since it includes country specific effects and this is an important fact in the estimation.

Model 4 and 5 are run for whole countries, developing countries, developed countries and countries in transition respectively. Results are shown in Table 4 and Table 5 separately. Each column on table refers to related country group above.

Table 4 reports estimation results of model 4. Results are close to theoretical expectations. FDI is statistically significant at 1% level in estimations including all countries and developing countries groups and effect of FDI is positive. Also its impact on growth is more than the impact of domestic investment. Other explanatory variables are statistically significant in most of the estimations. As an economic instability, inflation has negative and significant effect in all estimations. Negative externalities may cause the sign of the government expenditures. However financial development is statistically significant at 1% level and has negative sign for all groups and with exception for developing countries, schooling also has negative effect on growth interestingly.

Table 4. Fixed Effect Regression of the effects of FDI on Economic Growth for the Benchmark Model.

Variables	(1)	(2)	(3)	(4)
	Dependent variable: Real GDP per capita growth			
FDI	0.133***	0.147***	-0.00651	0.17
	(3.16)	(3.00)	(-1.18)	(0.9)
Financial Dev.	-0.00948***	-0.0922***	-0.0327***	-0.143***
	(-3.18)	(-6.24)	(-5.98)	(-3.43)
Openness	0.0284***	0.0396***	-0.00466	0.0501*
	(3.17)	(3.7)	(-0.52)	(1.82)
Secondary schooling	-0.0417*	0.00519	-0.118**	-0.0742
	(-1.90)	(0.22)	(-2.61)	(-0.64)
Government expenditures	-0.114**	-0.0568	-0.125	-0.00609
	(-1.97)	(-0.91)	(-1.32)	(-0.03)
Inflation	-0.0263***	-0.0527**	-0.0182***	-0.0682***
	(-2.89)	(-2.18)	(-2.71)	(-3.29)
Investment	0.0902***	0.0844***	0.0663	-0.0522
	(3.44)	(3.03)	(1.46)	(-0.45)
Constant	2.349	0.579	17.54***	10.96
	(1.37)	(0.33)	(3.54)	(1.09)
No. of observations	446	334	137	34
R-squared	0.316	0.448	0.530	0.657
Sample	All countries	Developing	Developed	Transition

* p<0.1, ** p<0.05, *** p<0.01. t statistics in brackets. Time span: 1960–2016.
Source: Author's own computation.

Extended model is estimated by adding interaction terms and results are reported in Table 5. According to results there is no significant effect of FDI on growth except regression of all countries. However, channels through which FDI affects growth are mixed in terms of being statistically significant and influencing growth either positively or negatively.

Table 5. Fixed Effect Regression of the Effects of FDI on Economic Growth for the Extended Model.

Variables	(1)	(2)	(3)	(4)
	Dependent variable: Real GDP per capita growth			
FDI	0.242***	0.0556	-0.324	-2.996
	(2.94)	(0.57)	(-0.98)	(-0.81)
Financial Dev.	-0.0535***	-0.0721***	-0.0337***	-0.13
	(-6.52)	(-4.54)	(-4.96)	(-1.43)
FDI* Financial Dev.	7.44E-05	-0.00180**	0.00033	-0.00795
	(0.19)	(-2.36)	(1.01)	(-0.43)
Openness	0.0178**	0.0241**	-0.0119	0.0686
	(2.27)	(2.14)	(-1.10)	(1.01)
FDI*Openness	0.000344**	0.000841***	0.000299	-0.00616
	(2.31)	(4.09)	(1.55)	(-0.48)
Secondary schooling	0.00314	0.0148	-0.129**	-0.269
	(0.16)	(0.63)	(-2.57)	(-1.30)
FDI* Secondary schooling	-0.00400***	0.000776	0.00239	0.0479
	(-3.78)	(0.45)	(0.65)	(1.1)
Government Expenditures	-0.109**	-0.0636	-0.127	-0.0313
	(-2.09)	(-1.02)	(-1.33)	(-0.12)
Inflation	-0.0306***	-0.0404*	-0.0199***	-0.0852***
	(-3.77)	(-1.72)	(-2.89)	(-3.42)
Investment	0.0775***	0.024	0.0747	-0.025
	(3.17)	(0.76)	(1.5)	(-0.17)
Constant	3.435**	2.249	19.31***	24.68
	(2.18)	(1.3)	(3.41)	(1.19)
No. of observations	510	334	137	34
R-squared	0.422	0.494	0.544	0.705
Sample	All countries	Developing	Developed	Transition

* p<0.1, ** p<0.05, *** p<0.01. t statistics in brackets. Time span: 1960–2016.
Source: Author's own computation.

Because of the presence of several parameters to be interpreted, the results of interaction terms are reported in Table 6 briefly.

Table 6. Brief Summary of FDI and Interaction Terms

	FDI				FDI*Financial Dev.				FDI*Openness				FDI*Human Cap.			
Effect on growth	+	+	-	-	+	-	+	-	+	+	+	-	-	+	+	+
Statistically significance	+	-	-	-	-	+	-	-	+	+	-	-	+	-	-	-
Country groups	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1: All countries, 2: Developing countries, 3: Developed countries, 4: Transition countries.																

Source: Author's own work.

In Table 6, if a variable influence growth positively (negatively) it takes '+' ('-') sign. If it is statistically significant (insignificant) at conventional levels it is marked as '+' ('-'). Country groups are identified by numbers and each number representing related country group is explained below the table.

According to the findings reported in Table 5, openness and domestic investment still matter for growth and the effect of FDI is still larger than the effect of domestic investment, in particular for developing countries although it is not statistically significant.

The results for transition countries are in accordance with Katerina et al., (2004)'s study showing that FDI has no effect on economic growth in transition countries. In addition, different types of growth functions of different countries may be the reason of the results especially, the results of developed and transition countries. Furthermore, as Iwasaki and Tokunaga (2014) confirm that empirical results exploring the effect of FDI on growth may rely on the study conditions such as estimation period, data type and estimator.

5. CONCLUSION

The relationship between FDI and economic growth has been widely studied for years. FDI is thought to be a substantial source in terms of human and physical capital accumulation for the host economy since it creates positive spillovers, enhances local firm productivity via labor training and disseminates the transfer of technology and organizational knowhow to host country. Empirical literature analyzing the FDI–growth connection provides either positive or negative relationship. So the impact of FDI on growth needs to be examined since it may depend on other conditions.

In this work, effect of FDI on growth is analyzed with control variables which are financial development, trade openness, government expenditure, inflation, secondary schooling as human capital, and domestic investment. Data covering the period 1960-2016 are collected from World Bank. First benchmark model is specified. Then extended model is constructed by adding interaction terms of FDI and AC variables. Two models are estimated for the different country groups to see how FDI impact differs across countries.

Main goal of this article is to examine the channels through which FDI affects economic growth. So the interaction terms are added to benchmark model to see the simultaneous effect rather than direct effect of FDI. Fixed effect estimation results are reported to keep the country specific effects.

Empirical results of benchmark model report that FDI has statistically significant and positive effect on growth for all countries and developing countries estimations and this effect is larger than the effect of domestic investment. In addition, the effect on developing countries is larger than the effect on whole countries.

According to the results of the extended model simultaneous effect of FDI and financial development is negative in developing countries regression and the effect of FDI and secondary schooling is negative in regression including all countries. This shows a threshold level exists and countries can benefit from the positive effects of FDI when these levels are exceeded.

Specific to developing countries, besides positive and significant effect of alone openness on growth FDI*openness has positive and significant effect, as well. Secondary schooling and FDI*secondary schooling are also affect growth positively but these impacts are statistically insignificant.

These findings support our theoretical expectations and show that developing countries depend more on FDI for growing. However, in terms of absorptive capacities through which FDI works, it is found that openness and secondary schooling as human capital are more attractive than financial development. Although there are other factors affecting economic growth FDI has important and noticeable role on economic effects.

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