

Foreign Direct Investment and Economic Growth: A Panel Data Analysis

Yuan Yao¹

Abstract:

This paper investigates the influences of FDI on economic growth of selected Latin American and Asian countries both directly and indirectly through factors such as technology, knowledge transfer, and trade openness. The study uses the growth regression to examine and identify not only the relationship between the FDI and economic growth of the underlying countries but also the interaction effects of FDI with human capital and trade openness on the economic growth based on the statistical performance of the interaction terms in the model. The evidence from the study shows that FDI does have an impact on economic growth both directly by capital accumulation and indirectly by the spill-over effect. However, the quality and type of FDI attracted in a country could influence or alter FDI's impact on economic growth. Furthermore, the study also indicates the extent of FDI's impact on economic growth will depend on how much a country can absorb that incoming new technology or knowledge based on the level of its human capital.

JEL Classification: F21, O30, O41

Keywords: FDI, Economic Growth

¹Undergraduate Student, Bryant University, 1150 Douglas Pike, Smithfield, RI02917. Phone: (401) 368-9619. Email: yyao2@bryant.edu.

1.0 INTRODUCTION

FDI (FDI), by definition, is the investment made by foreign companies or individual investors in a country so that to expand their future interests. Based on the historical data, it shows that such investment has dramatically increased and has become one major activity between countries over the past decades. However, at the same time, with the rise of such phenomenon, we also raised some questions for the consequences of FDI, such as what would be the effect of FDI on the economic growth of a country, and how would the effect of FDI be different in developed and developing countries. From a theoretical point of view, some growth theories developed by famous economists suggest that the FDI is posting a positive influence on the economic growth of a country either directly or indirectly through the components within the production of the host economy. According to the neoclassical growth theory, FDI helps to boost the host economy by mainly increasing the stock of physical capital in the host economy. On the other hand, based on the endogenous growth theory, the FDI helps to boost the economic growth of the host country by supporting the generation of new ideas or knowledge in the process of research and development or the improvement of management practice in the production of the country, which ultimately improves the productivity.

From a practical standpoint, however, the ideas suggested in the theories tend to not always behold true. Based on some studies about the relationship between FDI and economic growth, they have suggested an insignificant or even a negative influence of FDI on economic growth in their case studies. Some of these studies found that such a relation between FDI and economic growth can be attributed to the difference in absorptive capability between developing and developed countries.

The study will investigate the relationship between FDI and economic growth based on the regression analysis of data from selected developing and developed countries in the Latin American region and Asian regions. At the same time, the study will also examine the interactions between FDI with domestic investment and human capital such as education. The rest of the paper will be organized as follow: Section 2 will give a review of previous empirical works or studies on the same topic. Section 3 will show the recent trends of GDP growth and FDI inflow in both regions. Section 4 will present the empirical model and data information that is used in the regression analysis. Section 5 will present and discuss the results of regression analysis. Section 6

will conclude the empirical results along with suggested policy implications. Lastly, Section 7 will discuss the limitation of the study.

2.0 LITERATURE REVIEW

Many empirical studies tried to investigate the relationship between FDI and economic growth. As the endogenous growth model came out, many recent studies have tried to examine and identify the effect of FDI on economic growth based on its spillover effect on human capital development and technology diffusion in the host economy. According to Lin and Xiu (2005), the study that examines the effect of FDI on economic growth indicates that there is a strong positive complementary correlation between the FDI and economic growth in both selected developing and developed countries. Specifically, within that analysis, the study also presents that a positive interaction effect of FDI with the human capital to the economic growth, which verifies the positive spillover effect of FDI on education and knowledge transfer in a country that play important roles in its economic growth. At the same time, the negative significant correlation between the technological gap and economic growth presented in the study indicates the importance of the technology absorptive ability of that less developed country to the extent of the impact of FDI on that country's economic growth. Similar results have also been presented in Borensztein, Gregorio, and Lee (1998), the study that tried to investigate the same relationship between FDI and economic growth. The study found a positive significant interaction effect of FDI and education with the economic growth but only if the host economy can absorb that advanced technology or knowledge from FDI. In other words, a low level of human capital will tend to reduce or even eliminate the effect of FDI on economic growth in a country. Furthermore, the positive correlation between FDI and aggregate total investment indicates a crowding-in effect that is FDI is complementary to domestic investment, even though the robustness of this correlation tends to be less significant in its analysis. Lastly, the study also indicates human capital is a characteristic of FDI in its impact on economic growth compares to domestic investment. Such a result implies the idea of the effect of FDI on the development of human capital through advanced technology and knowledge transfer in the endogenous growth model.

Apart from the cross-sectional studies, there are country-specific case studies that also verified the correlation between FDI and economic growth. According to Hoang, Wiboonchutikula, and Tubtintong (2010), the study examines the relationship in the case of Vietnam. In detail,

except for the positive correlation between FDI and economic growth that was verified in the study, the statistically insignificant interaction effects of FDI with human capital and trade openness in the analysis indicate that the idea of advanced technology and knowledge transfer have not been applicable to Vietnam. Such a result again implies the importance of absorptive capability of advanced technology or knowledge transfer in the effect of FDI on economic growth, especially for low-income and mid-income countries. Furthermore, different from Borensztein, Gregorio, and Lee (1998), the study of Vietnam shows a crowding-out effect of FDI on domestic investment even though FDI still presented to be an independent effect on Vietnam's economic growth.

Following the Vietnam case study, the trade openness or the trade policy regime of a country seems also plays an important role when considering the magnitude of the impact of FDI on economic growth in some economic growth studies. One of the popular studies, Balasubramanyam, Salisu, and Sapsford (1996), shows that the effect of FDI on economic growth is enhanced in countries that pursued the trade policy in favor of exporting or trade openness compares to countries that adopted the import-substituting trade policy. The study specifically focused on the effect by classifying the subject countries into two categories: export-promoting (EP) and import-substituting (IS). The results show a positive significant correlation of FDI on economic growth in EP countries while having insignificant results for IS countries. Such a result indicates a complementary relationship between trade liberalization and FDI in the discussion of economic growth. Furthermore, Zhang (2001), the study that examines the impact of FDI on economic growth in Asian and Latin American countries, shows a similar result by indicating the country-specific factors such as liberalized trade regime or export-oriented strategy and high level of human capital condition in a country help to promote the success of FDI on host economic growth.

While seeing above studies show an overall positive significant correlation between FDI and economic growth, some other studies present an opposite result on the correlation. The study done by Carkovic, and Levine (2002) found that after resolving statistical problems based on the past studies for the growth regression model the regression itself does not verify the impact of FDI on economic growth independently. Furthermore, Athukorala (2003), a case study that focuses on the impact of FDI on the economic growth of Sri Lanka, found that FDI does not have an independent impact on economic growth, and the causality of FDI and economic growth tends to

be inverse in Sri Lanka. The insignificance of the result, according to the study, was caused by the low level of human capital condition, political instability, and restricted trade policy regime in the country. However, even though the study does not verify the impact of FDI on economic growth statistically significant, the study indirectly indicates the importance of country-specific factors such as human capital condition and trade policy regime that are essential to the success of FDI integration in the economic growth.

3.0 TRENDS

3.1 Trends in Asian region

Figure 1 shows the GDP growth trend in the Asian region between 1996 and 2019. The trend of Asian developing countries in the chart indicates an overall higher GDP growth rate than the Asian developed countries in the past 20 years, even though the tendency in GDP growth between developing and developed countries tends to be the same. The difference can be explained by the difference in the rate of return for the capital investment in the two types of countries which are caused by the difference in their fundamentals such as infrastructure and human capital. The other reason would be the phenomenon that developing countries can simply replicate the production methods or technology from developed countries, which then makes them experienced rapid growth relative to developed countries. Apart from this, the large decline in GDP growth especially for Asian developed countries in the late 1990s is likely attributed to the Asian Financial Crisis that started in Thailand in 1997. The main causes of the crisis are the failure in the currency exchange rate and the credit bubble. The influence went over East and Southeastern Asia including countries like Singapore, Indonesia, China, and Japan. The significant decline in GDP growth rate of Asian developed countries in 1998 relative to developing countries is mainly due to the larger volume of capital investment that took a more centralized place in developed countries compares to developing countries, and thus the reaction to the changes in the value of those assets in the developed markets tends to be larger. The other large drop in the GDP growth in the Asian region is the Great Recession that started in 2007 and hit the Asia region in the late 2000s.

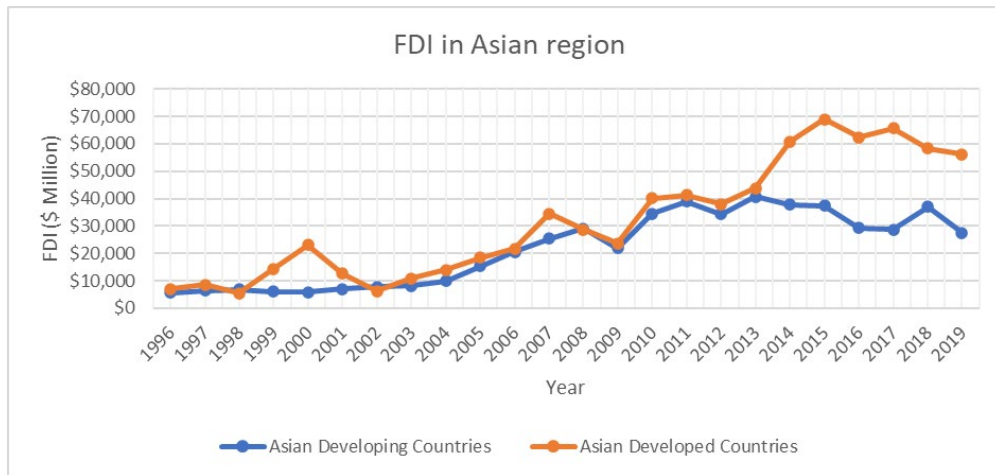
Figure 1: GDP growth in Asian region



Source: Author Calculation

Figure 2 indicates that both developed and developing countries in the Asian region have experienced an increasing FDI inflow that was due to the global expansion by the multinationals from abroad, which could attribute as one of the factors that fuel the growth in GDP in the Asian region mentioned above. Notice that, the decrease in FDI inflow starting in 2017 reflects the impact of the trade war between the United States and China. Furthermore, even with the increasing trend of FDI inflow, the gap between Asian developing and developed countries in the past seven to eight years is caused by the macroeconomic uncertainties such as geopolitical risks, trade tensions, and the lag in the development of fundamentals such as infrastructure that tended to prevent the attraction to FDI. However, China is one of the developing countries in East Asia that has been listed as the top FDI recipient over the past few years and continued to attract more FDI inflow from abroad based on its high quality of infrastructure, open trade policies, and high quality of human capital. Along with that, the FDI outflow of capital investment to both developed and developing countries around the world is also taking a big portion of its GDP in the past few years.

Figure 2: FDI in Asian region

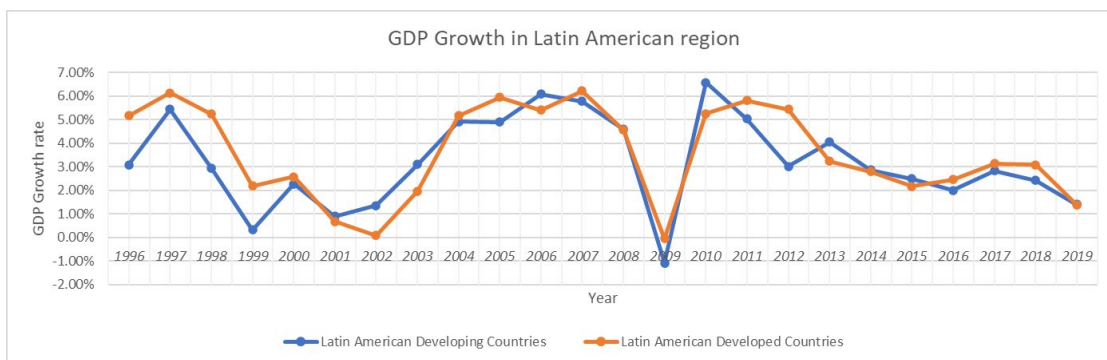


Source: Author Calculation

3.2 Trends in Latin American region

As shown in Figure 3, the GDP growth experienced in Latin American developed countries seems to be greater than in developing countries especially in the early stage, even though both developed and developing countries share a similar growth trend between 1996 and 2019. Apart from that, the GDP growth in the Latin American region seems to experience volatile change for the past two decades. The decline in GDP growth in the 1980s in the Latin American region was mainly caused by the Latin American Debt Crisis, which was due to the inability of Latin American countries to pay off their debts. The crisis caused a rise in the unemployment rate, a decline in the wage rate, and a decline in GDP growth in the region. Another significant decline in GDP growth in the Latin American region is during the Great Recession between 2007 and 2009.

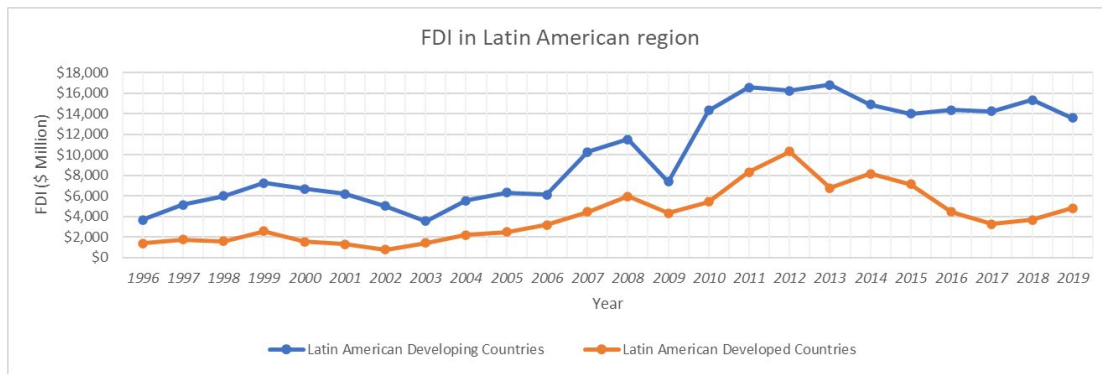
Figure 3: GDP growth in Latin American region



Source: Author Calculation

Figure 4 not only shows an increasing trend of FDI inflow in the Latin American region due to the global expansion and deepened internationalization but also indicates a continuous larger FDI inflow in Latin American developing countries than in developed countries for the past two decades. However, considering the lag in GDP growth of developing countries compares to developed countries in the region, the disconnection between the FDI inflow and GDP growth is mainly because of the lack of utilization of those inflow capitals in the product development. Such lack in utilization is coming from the inefficient local policymaking especially in the area of economic development and resource allocation in those developing economies. Therefore, even with the large volume of FDI inflow those local obstacles prevent developing countries in the Latin American region from experiencing higher GDP growth compares to developed countries during the same period.

Figure 4: FDI in Latin American region



Source: Author Calculation

4.0 EMPIRICAL MODEL AND DATA

4.1 Empirical Model

$$GDPGR_{i,t} = \beta_0 + \beta_1 FDI_{i,t} + \beta_2 DI_{i,t} + \beta_3 Trade_{i,t} + \beta_4 Edu_{i,t} + \beta_5 FDI_DI_{i,t} + \beta_6 FDI_Trade_{i,t} + \beta_7 FDI_Edu_{i,t} + \varepsilon \quad (1)$$

Where i represents individual countries and t represents the time period. The ε represents the error term in the model.

Based on the previous studies, the construction of the empirical model is shown in equation (1). The dependent variable, $GDPGR$, in the model represents the annual GDP growth rate of a country. The core independent variables in the model include the FDI that measures the net inflow

of foreign direct investment in the country; the *DI* represents the domestic investment of a country and is measured as the gross capital formation invested in that country; the *Trade* represents the trade openness of a country and is measured as the total volume of trade transaction happen in a year in that country; the *Edu* represents the level of human capital in a country and is measured by the ratio of people that have at least secondary school attainment to the total population in that country. Apart from this, the interaction variables FDI_DI, FDI_Trade, and FDI_Edu are interaction terms of FDI with other independent variables in the model, which will show the spill-over effect of FDI to the economic growth in a country. Appendix A shows the acronym, description, and data source for each individual variable.

4.2 Data

To incorporate with the empirical model, the data that used in the study is panel data from 1996 to 2019 with 27 countries selected from Asian region and Latin American region. The source of the data is mainly obtained from World Development Indicator, which is one of the most popular and comprehensive indicators that show different aspects of a country, and the Human Development Index database that is mainly providing information of every aspect of human development in a country. Table 1 shows the summary statistics of the panel data.

Table 1: Summary Statistics

Variable	Observation	Mean	Std.Dev	Min	Max
GDPGR	648	0.0393	0.0343	-0.131	0.145
FDI	648	16,287,297,213	36,204,459,375	-4,550,355,286	290,928,431,467
DI	648	197,409,977,854	620,558,947,230	960,544,518	6,115,038,281,453
Trade	648	327,441,035,503	647,117,169,527	2,643,215,001	5,204,476,705,312
Edu	648	51.684	17.665	14.980	93.800

5.0 EMPIRICAL RESULTS

Table 2: Regression for Asian Developed Countries

	(1)	(2)	(3)	(4)
	GDPGrowth	GDPGrowth	GDPGrowth	GDPGrowth
FDI	5.22e-15 (0.03)	1.96e-14 (0.11)	3.14e-12** (2.82)	2.51e-12 (1.92)
DI	-2.16e-14 (-1.48)	-1.98e-14 (-1.27)	-2.60e-14 (-1.72)	-2.41e-14 (-1.57)
Tradeopenness	-2.17e-14 (-1.09)	-2.03e-14 (-0.99)	1.22e-15 (0.06)	1.18e-14 (0.49)
HumanCapital	0.000429 (0.99)	0.000406 (0.92)	0.000277 (0.65)	-0.0000444 (-0.08)
FDI_DI		-1.97e-25 (-0.35)	1.13e-25 (0.20)	2.01e-25 (0.36)
FDI_Edu			-4.09e-14** (-2.84)	-2.23e-14 (-0.90)
FDI_Trade				-6.90e-25 (-0.92)
_cons	0.0309 (1.76)	0.0313 (1.77)	0.0200 (1.14)	0.0295 (1.45)
N	96	96	96	96
R ²	0.1477	0.1489	0.2194	0.2269

Notes: (1) Based on the Hausman test, all models in the sample are estimated using a random effects method. (2) Values in parentheses are t-statistics. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

To examine the impact of FDI on economic growth and the difference in that impact based on the variation in characteristics of different countries. The empirical analysis of this paper is divided into four parts that are focusing on developing and developed countries in the Asian region and Latin American region, respectively. The figures below present the empirical results of the regression analysis. Table 2 presents an estimation of the model based on the data of developed Asian countries. In detail, specification (1) that excludes the interaction terms of FDI shows a positive coefficient for FDI and human capital with economic growth while DI tends to be negative correlated with economic growth in Asian developed countries. However, the t statistics suggest that neither three independent variables show statistical significance with their coefficient. When taking into consideration of interaction terms FDI_DI and FDI_Edu, which is shown in specification (3), the coefficient of FDI is positively significant while the coefficient of FDI_Edu is negatively significant. The result indicates that the inflow of FDI is helping the Asian developed countries in their economic development through capital accumulation, however, at the same time, the FDI tends to be conflicted with local human capital development in the process of economic

growth. The negative correlation may be the result of the quality of FDI that attracted to the developed countries tends to be varied, which depends on the local government's FDI attraction strategy, and thus a poor quality of FDI will create a negative impact on local human capital development when considering relatively high human capital that has already existed in developed countries.

Table 3: Regression for Asian Developing Countries

	(1)	(2)	(3)	(4)
	GDPGrowth	GDPGrowth	GDPGrowth	GDPGrowth
FDI	2.84e-13 (1.76)	9.26e-13*** (5.72)	5.27e-13 (0.75)	4.35e-13 (0.60)
DI	-9.73e-15 (-0.72)	4.45e-14** (2.77)	4.49e-14** (2.78)	2.64e-14 (1.13)
Tradeopenness	-4.30e-15 (-0.21)	-4.17e-14* (-2.38)	-3.99e-14* (-2.25)	-3.02e-14 (-1.47)
HumanCapital	0.000113 (0.58)	0.0000848 (0.64)	0.0000445 (0.30)	-0.00000822 (-0.05)
FDI_DI		-1.99e-25*** (-4.67)	-2.40e-25** (-2.91)	-4.22e-26 (-0.22)
FDI_Edu			7.47e-15 (0.58)	1.31e-14 (0.95)
FDI_Trade				-2.31e-25 (-1.11)
_cons	0.0456*** (4.99)	0.0421*** (7.28)	0.0438*** (6.74)	0.0451*** (6.43)
N	216	216	216	216
R ²	0.1039	0.2252	0.2265	0.2320

Notes: (1) Based on the Hausman test, all models in the sample are estimated using a random effects method. (2) Values in parentheses are t-statistics. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

By looking at Table 3 shows the empirical result of the model from Asian developing countries, specification (1) indicates no significant result for either independent variable even though the coefficient of FDI shows a positive correlation with the economic growth in Asian developing countries. By including the interaction terms into the regression, on the other hand, the results are rather significant. In specification (2) that only consider the interaction term FDI_DI the coefficient of FDI and DI in the regression are positively significant, which indicating that both FDI and DI help the economic growth of Asian developing countries through their contribution on ways like capital accumulation. However, specification (2) also shows a negatively significant coefficient for FDI_DI indicating that there is a crowding-out effect of FDI on DI in a way that with the increase in the inflow of FDI more funds would be shifted to the foreign firms in the

saving market. The result of this shift would lead to an increase in interest rates for local firms who are trying to borrow funds for their investments. As a result, the local firms would tend to invest less when facing more inflow of FDI. Apart from this, when considering other interaction terms, that is shown in the specification (4), neither coefficient of each independent variable is significant. Such a result presents that the fact that the interaction effects of FDI with human capital and trade openness do not exist in Asian developing countries. Another interesting finding is that the trade openness in the specification (2) and (3) is negatively correlated with economic growth in Asian developing countries. One reason for such a result could be because the study did not consider trading strategy when categorizing countries into groups. Therefore, countries that have more portion of imports in their trade balance may tend to drag the coefficient of trade openness to become negative.

Table 4: Regression for Latin American Developed Countries

	(1)	(2)	(3)	(4)
	GDPGrowth	GDPGrowth	GDPGrowth	GDPGrowth
FDI	-3.87e-13 (-0.31)	2.43e-12 (1.01)	3.71e-12 (1.49)	2.72e-11** (2.86)
DI	-2.81e-12** (-3.17)	-2.50e-12** (-2.74)	-4.28e-12** (-3.08)	-4.72e-12*** (-3.47)
Tradeopenness	1.16e-12*** (3.39)	1.04e-12** (2.94)	1.66e-12** (3.26)	1.99e-12*** (3.90)
HumanCapital	-0.000524* (-2.49)	-0.000457* (-2.12)	-0.000413 (-1.92)	-0.0000889 (-0.36)
FDI_DI		-4.62e-23 (-1.36)	1.66e-22 (1.27)	3.24e-22* (2.30)
FDI Trade			-8.25e-23 (-1.69)	-1.07e-22* (-2.20)
FDI_Edu				-4.02e-13* (-2.55)
_cons	0.0640*** (4.43)	0.0563*** (3.64)	0.0509** (3.26)	0.0261 (1.45)
N	96	96	96	96
R ²	0.1827	0.1993	0.2241	0.2776

Notes: (1) Based on the Hausman test, all models in the sample are estimated using a random effects method. (2) Values in parentheses are t-statistics. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4 shows the estimates for the regression based on the data from Latin American developed countries. In specification (1), the regression presents significant results except for FDI. For independent variable DI, the negative correlation indicates that the efficiency and effectiveness

from the investments made by local firms on the industrial development are low or even create a negative impact on the economic growth of the host economy. However, the positive correlation of trade with economic growth indicates that a liberal trading policy regime did help the developed countries in the Latin American region to develop over time. On the other hand, when considering all variables, that is shown in the specification (4), the coefficient of FDI indicates a positively significant result which suggests that the inflow of FDI on Latin American developed countries will only impact countries' economic growth from its combined effect from the capital accumulation and spill-over effect. Furthermore, the positive correlation of FDI_DI with economic growth indicates the crowding-in effect of FDI that is the inflow of FDI leads to an increase in domestic investment in the country. However, the negative correlations of FDI_Trade and FDI_Edu with the economic growth indicate that FDI was conflicting with local trade policy and human capital development, which may be because of the difference in strategies for future development between the foreign firms and local government or firms.

Table 5: Regression for Latin American Developing Countries

	(1)	(2)	(3)	(4)
	GDPGrowth	GDPGrowth	GDPGrowth	GDPGrowth
FDI	-3.73e-13 (-1.00)	-5.02e-13 (-1.12)	2.17e-12 (1.73)	2.08e-12 (1.63)
DI	7.58e-14 (0.86)	4.82e-14 (0.47)	-1.19e-13 (-0.95)	-1.89e-13 (-1.09)
Tradeopenness	-3.38e-14 (-1.24)	-2.56e-14 (-0.81)	2.39e-14 (0.63)	6.29e-14 (0.78)
HumanCapital	0.000412 (1.47)	0.000395 (1.39)	0.000748* (2.35)	0.000718* (2.19)
FDI_DI		5.02e-25 (0.53)	2.01e-24 (1.75)	3.27e-24 (1.29)
FDI Edu			-5.17e-14* (-2.28)	-4.62e-14 (-1.79)
FDI_Trade				-1.18e-24 (-0.53)
_cons	0.0162 (1.27)	0.0178 (1.36)	0.00189 (0.13)	0.00256 (0.18)
N	240	240	240	240
R ²	0.0373	0.0389	0.0686	0.0689

Notes: (1) Based on the Hausman test, all models in the sample are estimated using a random effects method. (2) Values in parentheses are t-statistics. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Lastly, Table 5 shows the regression based on the data of Latin American developing countries indicates no significant result of FDI through all the specifications. The statistical

insignificance in the regression for FDI illustrates the developing countries were not efficiently utilizing the incoming fund or support from abroad in their economic development or resource allocation. Furthermore, the negative significant coefficient of FDI_Edu in the specification (3) indicates the importance of the absorptive ability of a country to the new technology or knowledge from abroad in the impact of FDI on economic growth. In this case, the result suggests that Latin American developing countries might not have the ability or capability to absorb that amount of foreign knowledge or technology considering the relatively low level of human capital and inefficient corporate management in local firms compare to developed countries. Therefore, the negative coefficient presents the conflict between FDI and local human capital. On the other hand, other independent variables like DI and trade openness also show an insignificant result respectively. However, the positive significant coefficient of human capital in specification (3) indicates that the Latin American developing countries were trying to improve their human capital so that to develop their productivity.

6.0 CONCLUSION AND POLICY IMPLICATION

With the empirical results of the four regressions, from a macro point of view, FDI does influence the economic growth of a country either directly by capital accumulation or indirectly by its spill-over effect to other components in the host economy. Based on the result, the local governments especially from Asian developing countries should not only actively promote inflow of FDI in their countries by developing better FDI attraction strategies, but also identify the type of FDI that is beneficial to their economy along with their domestic investment and development. For instance, China's effort on attraction of export-orienting manufacturing FDI, commitment of services liberation when it joined the WTO, and tax incentive policies had pushed or triggered a large volume of FDI into the country along with the rapid economic growth. Furthermore, the positive correlation of domestic investment indicating the efficiency and effectiveness of domestic investments in the development of Asian developing economies, suggests that those countries should also promote domestic investments made by the private sector so that to further improve their economies. For Latin American developed countries, they should continue to elaborate their liberal trade policy regime by putting more effort on trade reform so that to continuously develop in the future.

On the other hand, the empirical results also illustrate the problem of absorptive ability of a country to the new technology or knowledge in a way that with a low level of human capital more inflow of FDI will disturb the local development because of the inefficient utilization of those resources or capital in the host economy. Therefore, the local governments from Latin American countries should continue to develop their human capital to catch up with the footsteps of modern technology and its usages. Such development could include providing more learning opportunities or scholarships for students who are unable to go to school and more training programs for those low-skilled workers in the labor force.

7.0 LIMITATION

The limitations of this paper include two points. One is the coverage of sample data especially the number of countries included in the study is relatively small compares to other similar studies, which then leads to the fact that the regressions that based on the data in the study may not fully reflect the true results of the parameters in the population. On the other hand, the data of human capital in the study only measures the ratio of people that have at least secondary school attainment to the population and thus it does not reflect a different level of human capital in a country especially for the ratio of higher-educated people to the population. Therefore, it could influence the results especially for the interaction term of FDI with human capital.

Appendix A: Variable Description and Data Source

Acronym	Description	Data Source
GDPGR	Annual GDP growth rate	World development indicator; World bank
FDI	Net inflow of foreign direct investment in dollar amount	World development indicator; World bank
DI	Represents domestic investment; measured by gross capital formation in dollar amount	World development indicator; World bank
Trade	Represents trade openness; measured by total volume of trade transaction in dollar amount	World development indicator; World bank
Edu	Represents level of human capital; measured by percentage of people who have at least secondary school attainment to total population	Human Development Index
FDI_DI	Interaction term of FDI with domestic investment	Calculated
FDI_Trade	Interaction term of FDI with trade openness	Calculated
FDI_Edu	Interaction term of FDI with human capital	Calculated

BIBLIOGRAPHY

- Athukorala, W. (2003, January). The Impact of Foreign Direct Investment for Economic Growth: A Case Study in Sri Lanka. ResearchGate.
https://www.researchgate.net/publication/228944269_The_Impact_of_Foreign_Direct_Investment_for_Economic_Growth_A_Case_Study_in_Sri_Lanka.
- Amighini, A. A., McMillan, M. S., & Sanfilippo, M. (2017, January 16). FDI and Capital Formation in Developing Economies: New Evidence from Industry-level Data. NBER.
<https://www.nber.org/papers/w23049>.
- Balasubramanyam, V., Salisu, M., & Sapsford, D. (1996). Foreign Direct Investment and Growth in EP and is Countries. *The Economic Journal*, 106(434), 92-105.
doi:10.2307/2234933
- Borensztein, E., Gregorio, J. D., & Lee, J.-W. (1999, February 12). How does foreign direct investment affect economic growth? *Journal of International Economics*.
<https://www.sciencedirect.com/science/article/pii/S0022199697000330>.
- Budang, N. A., & Hakim, T. A. (2019). The crowding effects of foreign direct investment on domestic investment: Evidence from Asia. *International Journal of Business & Economic Development*, 07(02). <https://doi.org/10.24052/ijbed/v07n02/art-04>
- Carkovic, Maria V. and Levine, Ross Eric, Does Foreign Direct Investment Accelerate Economic Growth? (June 2002). U of Minnesota Department of Finance Working Paper, Available at SSRN: <https://ssrn.com/abstract=314924> or
<http://dx.doi.org/10.2139/ssrn.314924>
- Hoang, T., Wiboonchutikula, P., & Tubtimtong, B. (2010). Does Foreign Direct Investment Promote Economic Growth in Vietnam? *ASEAN Economic Bulletin*, 27(3), 295-311, from <http://www.jstor.org/stable/25773884>
- Li, X., & Liu, X. (2005, January 26). Foreign Direct Investment and Economic Growth: An Increasingly Endogenous Relationship. *World Development*.
<https://www.sciencedirect.com/science/article/pii/S0305750X04002013>.

Maria-Ramona Sârbu & Lenuta Carp (Ceka), 2015. "The Impact of Foreign Direct Investment on Economic Growth: The Case of Romania," Acta Universitatis Danubius. OEconomica, Danubius University of Galati, issue 11(4), pages 127-137, August.

Zhang, K. H. (2001). DOES FOREIGN DIRECT INVESTMENT PROMOTE ECONOMIC GROWTH? EVIDENCE FROM EAST ASIA AND LATIN AMERICA. Contemporary Economic Policy, 19(2), 175–185. <https://doi.org/10.1111/j.1465-7287.2001.tb00059.x>

