FOREIGN DIRECT INVESTMENT, FINANCIAL DEVELOPMENT AND ECONOMIC GROWTH: A STATIC PANEL ANALYSIS

Elya Nabila Abdul Bahri
Faculty of Economics and Management
Universiti Kebangsaan Malaysia
E-mail: elyanabila@siswa.ukm.edu.my

Nor Hakimah Haji Mohd Nor
Faculty of Management and Muamalah
Kolej Universiti Islam Antarabangsa Selangor
E-mail: norhakimah@kuis.edu.my

Abu Hassan Shaari Md Nor
Faculty of Economics and Management
Universiti Kebangsaan Malaysia
E-mail: ahassan@ ukm.edu.my

ABSTRACT

This study investigates the effects of financial development in enabling foreign direct investment to promote economic growth. A sample of 66 developing countries is examined over the period of 2004 to 2013 with static panel estimation: pooled ordinary least square (POLS), fixed effect (FE) and random effect (RE). Financial development is measured using three financial indicators and an index of financial development is constructed based on the following indicators: domestic credit to private sector and private credit by banks. The results demonstrate that financial development index contributes positively and higher than each financial development proxy in influencing the effects of FDI on economic development. It suggests that financial development serves as a form of absorptive capacity that enables the positive growth effects of FDI in the recipient countries.

***Keywords**:* financial development, economic growth, foreign direct investment, developing countries

1. INTRODUCTION

In recent years, policymakers, especially in developing countries, have come to the conclusion that foreign direct investment (henceforth, FDI) is needed to boost the growth in their economy. It is claimed that FDI can create employment, increase technology development, knowledge transfer and improve the economic condition in host country. FDI inflow to developing countries is assumed to produce positive externalities through technology transfer and spill-over effect (Carkovic & Levine, 2002).

The recent empirical literature has highlighted that financial development is a key explanation for the inconclusive and ambiguous findings in the FDI-growth nexus. Financial development is recognized as a form of absorptive capacity as well as a precondition that enables the positive growth effects of FDI to be materialized. According to Levine (2005),

growing evidence shows that financial institutions and financial markets can exert a strong influence on economic development. Alfaro et al. (2009) provide evidence that financial markets act as a channel in facilitating the positive growth effects of FDI to be realized where the study finds that countries with well-developed financial markets gains significantly from FDI through total factor productivity improvements.

In the finance-growth nexus literature, a large body of research has shown that financial development exerts positive impact on economic growth. The importance of financial development is theoretically acknowledged through its functions and services rendered in the process of economic growth (Levine 2005; Hermes & Lensik, 1996). Five major functions of financial system that contribute to promoting economic growth have been highlighted in a study by Levine (2005). Meanwhile from the theoretical perspectives, FDI also would contribute to growth through its spillovers. There are studies that find FDI generates externalities in the form of technology transfer and contributes to economic development (see, for examples Liu 2008; Chakraborty & Nunnenkamp 2008; among others). Thus, both FDI and financial development are shown to be important and complement in their relation to promote economic growth. Further, this study investigates the relationship between financial development and FDI with economic growth using static panel analysis for a sample of 66 countries over a period 2004 to 2013.

The objective of this study is to examine the impact of FDI on economic development via financial development among 66 selected developing countries. This study considered FDI and financial development as variables that may affect economic development because investment and financial assistance among the most important variables in a country to measure its development. An economy can benefit from an increase in FDI inflows to the country through financial development. This paper is organized as follows: Section II provides discussion on past literature of FDI to growth and financial development to growth. Section III presents the econometric data and data source. Section IV provides methodology that includes the analysis. Section V discusses the empirical findings. Finally, Section VI summarizes the conclusions.

2. LITERATURE REVIEW

In the early literature, Markusen (1984) and Markusen and Venables (1995) showed that horizontal FDI is market-seeking or these firms expand overseas to avoid trade costs, leading to a substitutionary relationship with trade. On the other hand, Helpman (1984) showed the possibility of a complementary relationship when vertical FDIs are involved due to the fragmentation of the production process geographically. This results in the location of different stages of production in host economies that offer the best cost advantages for a particular stage of production.

From the theoretical perspective, Aghion and Howitt (1992) who significantly contributes to the new growth theory highlight the fact that the innovations generated from technological knowledge take one step ahead in the form of new goods, new markets or new processes towards sustaining a positive growth rate of output per capita in the long run. Thus, leaning on the features of capital and its spillovers, FDI is seen as another potential source for economic growth where it would generate direct and indirect impacts through the positive spillovers. In another perspective of causality, Gao (2005) in his theoretical study of FDI and economic growth in a two-country endogenous growth model, views that although there are positive correlations often noted between inward FDI and economic growth, the relationship may not be causal. Gao (2005) finds that in the core-periphery or developed country, the economic integration which gives rise to FDI leads to an expansion of research and

development activity, as well as increases the growth rate, while periphery or less developed countries benefit from the increases in the living standards. Liu (2008) proposes that FDI spillovers could decrease the short-term level of productivity but increase the long-term productivity growth rate of local firms. In the long run, technology spillovers serve as a source of knowledge that can make productivity growth rate sustainable, as well as functioning as an ultimate engine of economic growth.

Extensive literature has discovered the absorptive capacity as a key explanation to the ambiguous results in the FDI-growth nexus. Financial development has been introduced as a crucial channel that would enable the growth effects of FDI to be realized. Collectively past studies empirically find that higher level of financial development serves as a precondition to stimulate the positive growth effects of FDI. Study by Hermes and Lensink (2003) discovers that the development of banks and stock markets are important pre-requisite for positive growth effects of FDI to be materialized. Hermes and Lensink (2003) utilize the regressions of growth equation and cross section of the data set of 67 of less developed countries for the period of 1970 to 1995. Following Hermes and Lensink (2003), Alfaro et al. (2004), Azman-Saini et al. (2010) and Choong (2012) also find the similar findings on the important role of financial development in the FDI-growth nexus. Alfaro et al. (2004) employ cross-country data for the period of 1975-95 for OECD countries. Meanwhile Azman-Saini et al. (2010) utilize cross-country observation for 91 countries for the period of 1975-2005. Some other studies for examples, Lee and Chang (2009) and Ang (2009) also consistently establish the same finding of the positive link of FDI-growth with the financial development as a pre-condition.

Recent study from Iamsiraroj and Ulubaşoğlu (2015) concluded that FDI positively effects on economic growth based on utilizing global sample of 140 countries in the period 1970 to 2009. The purpose of their study is to make final conclusion to overcome the ambiguity based on variety findings on the study of FDI on economic growth by exploring 108 published in related studies. They also find that the association holds globally as strongly as in the developing countries compared to developed countries. The appropriate absorptive capacity indicators for positive growth are identified to be trade openness and financial development rather than schooling.

Theoretically, financial development would serves as an effective precondition in the FDI-growth nexus due to its major functions. The role of financial development in the economy has been well acknowledged since decades ago. The evidence becomes even more convincing after studied by Levine (1997) that find the level of financial development as a good predictor for future economic growth, capital accumulation and technological change. According to Levine (1997), major functions of financial system provide different implication in every dimension of the activities in the economy. Levine (1997) highlights five functions of financial system i.e. facilitate risk management, allocate resources, exert corporate control, mobilize savings and ease trading of goods and services which consequently channels capital accumulation as well as technological innovation to growth. The more efficient the functions the more developed financial development will be which impliedly ameliorate market frictions of information and transaction costs. As a result, the economic growth can be promoted through the well-functioning and developed financial development.

Although recent studies discover that financial development serves as a precondition for the positive growth effects of FDI to be realized, the relationship between the variables including FDI and economic growth based on the level of financial development have not been adequately addressed in the existing studies. The issue of concern for better understanding of the channels through which FDI works to impact economic growth positively (Lemi & Asefa, 2003). The influence arises from the absorptive capacity of the

FDI from host country. Although quite a number of extant studies have dealt with some aspects of this issue, our study contributes to the extension of the literature in two points. First, our study focuses on developing countries. There are 66 countries have been selected based on availability of data cover the period from 2004 to 2013. According to Alfaro et al. (2004), developing countries welcoming more FDI started from 1980s and onwards because of the debt crises which they believe that FDI can help to improve. In addition, multinational enterprises are likely to get cheaper labour in the developing countries that reduce the production cost. Thus, the study of FDI in developing countries is more meaningful compared to developed countries. Second, we homogenized our data into four quartiles to get clearer on financial development impact towards FDI on promoting economic growth based on different level of financial development. The level of financial development and the performance of FDI on promoting economic growth may have different effect due to the nonlinearity of financial development in the relationship with economic growth in recent literature. Therefore, this paper attempts to contribute to the existing literature in the different dimensions.

2.1 Theoretical Background

To understand the effect of foreign direct investment and financial development on economic development, the macroeconomic in IS equation will be used:

$$Y=f(C,I,G,X,M) \quad (1)$$

It can be written as:

$$Y = C + I + G + (X-M) \quad (2)$$

where, Y is Gross Domestic Product, C is consumption, I represent investment, and G is government spending. Foreign direct investment contribute in IS equation in term of investment from foreign company, while financial development will contribute to financial assistance that encourage to increase consumption through bank lending. Investment and financial development is expected to have positive sign in the model. In this study, this theory will be applied to find empirical result to prove this theory.

3. DATA AND METHODOLOGY

This study using macro panel data consist of 66 selected developing countries (as listed in Table 1) that covers 10-year period from 2004 until 2013. The countries have been selected for this study is primarily dictated by availability and reliability of data over the sample period. The total observation for the study is 652 by using unbalanced panel. The variable that used in this study is the real GDP per capita to indicate economic development and foreign direct investment inflows (% of GDP) for investment. While domestic credit to private sector (& of GDP) (DCPS), liquid liabilities (% of GDP) (LIAB) and private credit to deposit money (% of GDP) (PC) are the proxies for financial development, following Law & Singh (2014) and Adeniyi & Omisakin (2012). The control variables using government final consumption (GFC), gross fixed capital formation (GFCF) to indicate domestic investment, consumer price index (CPI) indicating inflation, and average years of schooling as a proxy for human capital (HC). All data are in logarithm form except human capital. The data are obtained from World Databank Indicators, UNCTAD Database, Financial Structure Dataset, and Barro and Lee website.

As may be observed from Table 1(a), Malaysia and most Southeast Asia countries belong to quartile 1 and quartile 2. Quartile 1 indicates the highest financial development following quartile 2 and quartile 3 until the lowest financial development at quartile 4. There are few issues to be highlighted in descriptive statistics as shown in Table 1(b). GDP and domestic investment increase as we move from countries in quartile 4 to quartile 1, but the trends are different for FDI, government final consumption, inflation and human capital. Variations in FDI are largest in quartile 2's countries, following quartile 4 and quartile 3. Surprisingly, FDI is lowest in quartile 1's countries. It may have related with nonlinear of financial development hypothesis made by Law & Singh (2014) and Samargandi et al. (2015). The largest government final consumption and human capital are both in quartile 2's countries. In reverse relationship with GDP, quartile 4's countries have the highest inflation. However, quartile 1 is not the lowest inflation but in quartile 2. From descriptive statistic, quartile 2's countries have most stable economic condition compared to quartile 1.

3.1 Calculation of index of financial development (IFD)

The IFD is calculated as a component index from the average of three indicators, following Law & Singh (2014); domestic credit to private sector, liquid liabilities and private sector to deposit money by banks. All indicators of IFD have positive relationship to economic growth as follows:

i) Domestic credit to private sector as percentage of GDP (DCPS)
DCPS indicating financial depth. It refers to financial resources provided to the private sector.

ii) Liquid liabilities (% of GDP) (LIAB)
LIAB indicating financial depth. Liquid liabilities are also known as broad money, or M3. They are the sum of currency and deposits in the central bank (M0), plus transferable deposits and electronic currency (M1), plus time and savings deposits, foreign currency transferable deposits, certificates of deposit, and securities repurchase agreements (M2), plus travelers' checks, foreign currency time deposits, commercial paper, and shares of mutual funds or market funds held by residents.

iii) Private credit by deposit money banks to GDP (%) (PC)
PC indicating financial depth. It refers to the financial resources provided to the private sector by domestic money banks as a share of GDP. Domestic money banks comprise commercial banks and other financial institutions that accept transferable deposits, such as demand deposits.

The definitions of the indicators to economic growth are based on Financial Structure Dataset from World Bank and the expected sign of all indicators are positively on economic growth.

The construction of the IFD in this study involves a three-step process, following Malaysian Well-Being Index (2013). The first step is to obtain the standard score for each indicator' step two to obtain the index score for the indicator; and step three to derive the component indices to gain IFD.

3.1.1 Step 1: Obtain the Standard Score of each Indicator in $Year_t$

The standard score expresses an observation in terms deviation units above or below the mean that is, the transformation of an observation by subtracting the mean and dividing by the standard deviation. The calculations are as given below:

$$z = \frac{x_{jt} - \mu_j}{\sigma} \quad (3)$$

where x_{jt} indicate the indicator j value at time t, μ is the mean value of indicator, σ is the standard deviation of data series, and z is the standard score.

Table 1: Country list and descriptive statistics

(a) Countries and levels of financial development

Quartile 1		**Quartile 2**		**Quartile 3**		**Quartile 4**	
Country	IFD	Country	IFD	Country	IFD	Country	IFD
Korea, Rep.	0.85	Mongolia	0.34	Botswana	0.22	Mozambique	0.13
Malaysia	0.69	Indonesia	0.32	Honduras	0.22	Cambodia	0.12
Brazil	0.65	Kazakhstan	0.31	Bolivia	0.21	Ghana	0.12
Thailand	0.65	Moldova	0.30	Romania	0.21	Burundi	0.12
South Africa	0.62	Costa Rica	0.28	Albania	0.20	Senegal	0.11
Russia	0.59	Egypt	0.28	Pakistan	0.20	Togo	0.11
China	0.57	Sri Lanka	0.27	Serbia	0.19	Tanzania	0.10
Turkey	0.54	Namibia	0.27	Kenya	0.19	Benin	0.10
Colombia	0.45	Ecuador	0.26	Nepal	0.18	Cameroon	0.10
Jordan	0.41	Ukraine	0.26	Paraguay	0.17	Mali	0.10
Peru	0.41	Bangladesh	0.26	Cote d'Ivoire	0.17	Uganda	0.10
Mexico	0.40	El Salvador	0.25	Dominican Rep.	0.16	Malawi	0.09
India	0.39	Guatemala	0.24	Guyana	0.15	Niger	0.09
Morocco	0.39	Tunisia	0.24	Lesotho	0.14	Sudan	0.09
Mauritius	0.39	Vietnam	0.24	Nicaragua	0.13	Congo, Dem. Rep.	0.08
Philippines	0.37	Belize	0.22	Algeria	0.13	Sierra Leone	0.06
Panama	0.34	Armenia	0.22				

(b) Descriptive Statistics

Variable	All	Quartile 1	Quartile 2	Quartile 3	Quartile 4
GDP					
Mean	2,700.19	5,423.55	2,468.49	2,280.47	472.54
Std. Dev.	3,112.24	4,507.03	1,418.37	1,791.24	222.65
FDI					
Mean	4.41	3.65	5.20	3.89	4.88
Std. Dev.	4.67	3.22	5.46	3.16	5.98
FinDev					
Mean	0.27	0.51	0.27	0.18	0.10
Std. Dev.	0.17	0.15	0.03	0.03	0.02
GFC					
Mean	14.01	14.54	13.19	14.43	13.89
Std. Dev.	6.02	3.51	4.92	7.15	7.68
CF					
Mean	23.15	24.78	23.95	22.32	21.37
Std. Dev.	6.36	6.21	632	6.28	6.12

INF					
Mean	92.68	93.94	90.69	92.07	94.07
Std. Dev.	19.41	14.02	19.58	18.77	24.25
HC					
Mean	2.36	2.983	3.15	2.26	0.95
Std. Dev.	1.41	0.93	1.68	0.86	0.70

3.1.2 Step 2: Obtain the Sub-Index for Each Indicator in (I_{tj})

The index of each indicator for each year (I_{tj}) is then obtained by multiplying the standard score by 10, and adding 100 for positive indicator such as bank credit to bank deposit, or subtracting by 100 for negative indicator such as net interest margin. The trend for negative indicators was corrected in order to have a consistent reading,

Sub-index of a positive indicator:

$$I_{tj}^{+} = 100 + (z * 10) \quad (4)$$

Sub-index of a negative indicator:

$$I_{tj}^{-} = 100 - (z * 10) \quad (5)$$

where *t* is referred to year and *j* is the indicator.

Once this step is completed, the sub-index must be started from base year. In our case, our data is started from year 2004. The value for year 2004 will always be 100 for each country. Therefore, the sub-index value can be compared to the initial year or the base value, where the standard score (*z*) is divided by the base value. For example, to gain the sub-index for year 2013, the calculation of index with base-value 2004 as follows:

$$I_{2013j} = \left(I_{tj}^{+/-} / I_{2004j}\right) * 100 \quad (6)$$

3.1.3 Step 3: Obtain the Index for Quality Banking Development (IQBD) in $Year_t$

The index of quality banking development component is then obtained by averaging the value of indicator indices or sub-index with base value 2004 for the respective component as follows:

$$IQBD = \frac{1}{N}\sum_{j=1} I_{tj} \quad (7)$$

where I_c is the component index, *N* is the number of indicators, and I_{tj} is the index indicator j with base-value 2004 for $year_t$.

3.2 Panel Data Analysis

Panel data analysis employed static and dynamic panel estimation. Panel data models examine group (individual-specific) effects, time effects, or both in order to deal with heterogeneity or individual effect that may or may not be observed. These effects are either fixed or random effect. A fixed effect (FE) model examines if intercepts vary across group or time period, whereas a random effect (RE) model explores differences in error variance components across individual or time period.

3.2.1 Static Panel Model and Estimation

3.2.1.1 Pooled OLS (POLS)

The Pooled OLS is a pooled linear regression without fixed and random effect. It assumes a constant intercept and slopes regardless of group and time period. Since our empirical analysis involves a panel of countries, the baseline model equation can be written in a panel data form as:

$$y_{it} = \beta_0 + \beta_1 FDI_{it} + \beta_2 FinDev_{it} + \beta_3 X_{it} + \varepsilon_{it} ; \quad (8)$$

where,

y = natural logarithm of real gross domestic product
FDI = natural logarithm of foreign direct investment
$FinDev$ = natural logarithm of financial development
X = vector of other conditional variables that effect gross domestic product
ε = error term, $\varepsilon_{it} = 0$
i = country effect, $i = 1, 2, \ldots, N$
t = time effect, $t = 1, 2, \ldots, T$

The impact of $\beta_1$and β_2 are expected to be positive sign on economic. The group of financial development including four proxies: domestic credit to private sector (DCPS), liquid liabilities (LIAB) and private credit by deposit money by banks to GDP (PC). All proxies are tested by separated model and also comprised by constructing financial development index (IFD) to avoid multicollinearity in estimation. The group of control variables is comprised of variables frequently used in the FDI-growth literature including government final consumption (GFC), gross fixed capital formation (GFCF), inflation (INF), and human capital (HC).

The extension of model specification is to interact between FDI and financial development to investigate the role of financial development in FDI-growth. The model can be specified as follows:

$$y_{it} = \beta_0 + \beta_1 FDI_{it} + \beta_2 FinDev_{it} + \beta_3 (FDI\ X\ FinDev)_{it} + \beta_4 X_{it} + \varepsilon_{it} ; \quad (9)$$

where β_3 is the coefficient for interaction between FDI and financial development including DCPS, LL and PC by separated model.

3.2.1.2 Fixed Effect (FE) Model

The FE method introduces the country specific effect by estimating different intercepts for each pool member country. The functional form of FE is as follows:

$$y_{it} = \beta_0 + \beta_1 FDI_{it} + \beta_2 FinDev_{it} + \beta_3 X_{it} + \eta_i + \varepsilon_{it} ; \quad (10)$$

where η_i is unobserved country-specific term. Fixed effect which has individual specific effect indicates the different of intercept by using LSDV with the same slope that parallel with each country. Its major benefit is that it always provides consistent estimated regardless of correlation between the specific effects and the explanatory variables.

3.2.1.3 Random Effect (RE) Model

Random effect model incorporates a composite error term, $\omega_{it} = u_i + v_{it}$. The u_i are assumed independent of traditional error term v_{it} and regressor X_{it}, which are also independent of each other for all i and t. The equation can be written as follows;

$$y_{it} = \beta_0 + \beta_1 FDI_{it} + \beta_2 FinDev_{it} + \beta_3 X_{it} + \omega_{it} ; \quad (11)$$

where, $\omega_i \sim IID(0, \sigma_u^2)$, and $v_{it} \sim IID(0, \sigma_v^2)$. The random effect model is based on Generalized Least Squares (GLS) estimator that takes time series as well as the cross-sectional dimension of the data into account and it treats intercepts as random variables across the pooled member countries. Random effect model provides efficient estimates especially when there is little time-series variation. However, biased and inconsistent estimates are likely to occur if the specific effect is correlated to some of the explanatory variables.

3.2.1.4 F-test for Fixed Effects

In a regression of fixed effect, $y_{it} = \alpha + \mu_i + \beta X_{it} + \varepsilon_{it}$ the null hypothesis is that all dummy parameters except for one for the dropped are all zero ($H_0: \mu_1 = \cdots = \mu_{n-1} = 0$). The alternative hypothesis is that at least one dummy parameter is not zero. This hypothesis is tested by F-test, which is based on loss of goodness-of-fit.

$$F(n-1, nT-n-k) = \frac{(R^2_{LSDV} - R^2_{pooled})/(n-1)}{(1-R^2_{LSDV})/(nT-n-k)} \quad (12)$$

The hypotheses are, H_0: Pooled OLS and H_1: FE. If the null hypothesis is rejected (at least one group/time specific intercept u_i is not zero), we may conclude that there is a significant fixed effect or significant increase in goodness-of-fit in the fixed effect model. Therefore, the fixed effect model is better than pooled OLS.

3.2.1.5 Breusch-Pagan LM Test for Random Effects

Breusch and Pagan's (1980) Lagrange multiplier (LM) test examines if individual (or time) specific variance components are zero, $H_0: \sigma_u^2 = 0$. The LM statistic follows the chi-squared distribution with one degree of freedom.

$$LM_u = \frac{nT}{2(T-1)} \left[\frac{T^2 \tilde{e}' \tilde{e}}{e'e} - 1 \right] \sim \chi^2(1) \quad (13)$$

The hypotheses are, H_0: Pooled OLS and H_1: RE. If the null hypothesis is rejected, we can conclude that there is a significant random effect in the panel data, and that the random effect model is able to deal with heterogeneity better than the pooled OLS.

3.2.1.6 Hausman Test

The Hausman specification test compares fixed and random effect models under the null hypothesis that individual effects are uncorrelated with any regressor in the model (Hausman, 1978). The hypotheses are; H_0: RE and H_1: FE. If the null hypothesis is rejected, we may conclude that individual effects u_i are significantly correlated with at least one regressor in the model and thus the random effect model is biased. Thus, we need to go for fixed effect model rather than the random effect counterpart.

4. EMPIRICAL FINDINGS

4.1 Results of static panel estimations

The estimated results for model without interaction are reported in Table 2. The first column in the table show the coefficient estimated by POLS, followed by FE and RE models. The results show that FDI is not significant in all model, while financial development are positively significant on economic growth in all models of estimation and also model of specification. Then, we employ FE (within) regression method to estimate the FE model. The result shows that FE model fits the data better than does the POLS since there is an improvement in goodness of fit measures. F-test is used to diagnose if all the country specific effects are equal across countries. However, the calculated F-statistics rejects the null hypothesis of jointly equal country specific effects and suggests that the pooled regression is inappropriate. This confirms that between POLS and FE model, the best model is FE. The parameter in RE model estimates financial development positively significant which consistent with the theory for all specification. To test whether there exists any random effect, the Breusch-Pagan Lagrange multiplier (LM) test is conducted. LM test results, the p-value is lower than 0.01 indicate it significant at 1% level indicates that the null hypothesis is favor of the random group effect model. The probability of calculated Hausman test statistics is significant and to reject the null hypothesis of no correlation between the individual effects and the regressors. The result indicates that FE model is more efficient than the RE model.

The interaction model is used to investigate the role of financial development in FDI-growth relationship and is reported in Table 3. In interaction specification, the relationship between FDI on economic growth is consistently negative and significant for all model of estimation and all specification. However, financial development is positive and significant for all proxies. Interestingly, the financial development has the highest contribution on promoting economic growth by using index of financial development (IFD). Interaction between IFD with FDI results higher coefficient at 2.114 in FE model compared to its component. Thus, the IFD that we constructed has been successfully tested and influence FDI to accelerate growth faster. FE is the best model to estimate the specification for all financial development proxies based on Hausman test which rejecting the null hypothesis at 1% significance level.

The comparison between without and with interaction model for FDI and IFD is shown at Table 4. We homogenized our data by disaggregate into four quartile based on the level of financial development, where Quartile 1 is the highest level of financial development while Quartile 4 is the lowest level of financial development. To investigate the performance of FDI based on the difference of financial development level, we employed Least Square Dummy Variable 2 (LSDV2) to avoid multicollinearity. Surprisingly, FDI achieve the highest performance at Quartile 2 at 0.018 as compared to Quartile 1 at 0.011. The sequence from the highest to the lowest is starting from Quartile 2, following by Quartile 3, Quartile 1, and lastly Quartile 4. FDI performance based on the difference of financial development level is illustrated at Figure 1. However, from Figure 1, there is no much difference between Quartile 1-3. This situation indicated the higher level of financial development or too much finance may harm growth due to the nonlinear or Kuznets relationship between financial development and economic growth as studied from Law & Singh (2014) and Samargandi et. al (2015).

Country specific effect is shown at Table 5. From Table 5, the highest intercept is for South Korea at 2.443 indicating this country gain FDI performance more efficient compared to other country. While Burundi experienced the lowest FDI performance due to the lowest intercept in the sample.

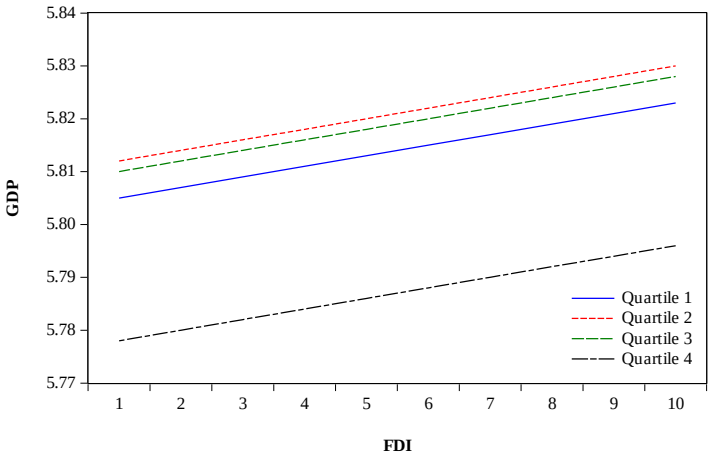

Figure 1: FDI-growth based on the level of financial development

Table 2: The Role of Financial Development in FDI-Growth Nexus: Static Panel (without interaction) (Dependent Variable: GDP)

	Model 1 (DCPS)			Model 2 (LL)			Model 3 (PC)			Model 4 (IFD)		
	POLS	FE	RE	POLS	FE	RE	POLS	FE	RE	POLS	FE	RE
GFC	0.001	0.001	0.001	0.010	0.010	0.010	0.003	0.004	0.003	0.004	0.002	0.004
INF	0.305***	0.316***	0.305***	0.308***	0.317***	0.308***	0.301***	0.313***	0.301***	0.304***	0.310***	0.304***
CF	0.074***	0.075***	0.074***	0.078***	0.078***	0.078***	0.080***	0.080***	0.080***	0.084***	0.083***	0.084***
HC	0.055***	0.041***	0.055***	0.062***	0.050***	0.062***	0.059***	0.313***	0.059***	0.038***	0.025*	0.038***
FDI	0.002	0.002	0.002	0.003	0.003	0.003	0.002	0.002	0.002	0.001	0.001	0.001
DCPS	0.078***	0.072***	0.078***	-	-	-	-	-	-	-	-	-
LIAB	-	-	-	0.091***	0.085***	0.091***	-	-	-	-	-	-
PC	-	-	-	-	-	-	0.067***	0.062***	0.067***	-	-	-
IFD	-	-	-	-	-	-	-	-	-	0.991***	1.018***	0.991***
Constant	5.368***	5.373***	5.368***	5.233***	5.247***	5.233***	5.393***	5.396***	5.393***	1.053*	0.948*	1.053*
R^2	0.687	0.688	0.687	0.679	0.679	0.679	0.683	0.684	0.683	0.701	0.701	0.701
F-test		1533.57 (0.000)			1796.69 (0.000)			1563.66 (0.000)			2075.96 (0.000)	
LM test			2643.35 (0.000)			2752.64 (0.000)			2654.85 (0.000)			2768.62 (0.000)
Hausman test			31.81 (0.000)			42.72 (0.000)			33.06 (0.000)			34.75 (0.000)

Note: ***, ** and * denotes significant level at 1%, 5% and 10%, respectively. p-value in parentheses.

Table 3: The Role of Financial Development in FDI-Growth Nexus: Static Panel (with interaction) (Dependent Variable: GDP)

	Model 1 (DCPS)			Model 2 (LL)			Model 3 (PC)			Model 4 (IFD)		
	POLS	FE	RE	POLS	FE	RE	POLS	FE	RE	POLS	FE	RE
GFC	0.000	0.001	0.000	0.011	0.011	0.011	0.003	0.003	0.003	0.003	0.001	0.003
INF	0.306***	0.317***	0.306***	0.310***	0.320***	0.310***	0.302***	0.314***	0.302***	0.304***	0.310***	0.304***
CF	0.076***	0.077***	0.077***	0.080***	0.081***	0.080***	0.081***	0.081***	0.081***	0.083***	0.082***	0.083***
HC	0.053***	0.039***	0.053***	0.059***	0.047***	0.059***	0.058***	0.044***	0.058***	0.037***	0.025*	0.037***
FDI	-0.036**	-0.037***	-0.036**	-0.045**	-0.047**	-0.045**	-0.029*	-0.030**	-0.029*	-0.963**	-0.994**	-0.963**
DCPS	0.065***	0.059***	0.065***	-	-	-	-	-	-	-	-	-
LIAB	-	-	-	0.074***	0.068***	0.074***	-	-	-	-	-	-
PC	-	-	-	-	-	-	0.056***	0.050***	0.056***	-	-	-
IFD	-	-	-	-	-	-	-	-	-	0.747***	0.766***	0.747***
FDI X DCPS	0.011***	0.0118***	0.011***	-	-	-	-	-	-	-	-	-
FDI X LIAB	-	-	-	0.013**	0.014**	0.013**	-	-	-	-	-	-
FDI X PC	-	-	-	-	-	-	0.010**	0.010**	0.010**	-	-	-
FDI X IFD	-	-	-	-	-	-	-	-	-	0.209**	0.215**	0.209**
Constant	5.402***	5.408***	5.402***	5.279***	5.295***	5.279***	5.425***	5.429***	5.425***	2.185***	2.114***	2.185***
R^2	0.692	0.693	0.692	0.682	0.682	0.682	0.686	0.687	0.686	0.703	0.704	0.703
F-test		1542.24 (0.000)			1800.10 (0.000)			1560.77 (0.000)			2001.57 (0.000)	
LM test			2610.27 (0.000)			2731.38 (0.000)			2614.21 (0.000)			2630.51 (0.000)
Hausman test			31.08 (0.000)			42.70 (0.000)			32.48 (0.000)			32.12 (0.000)

Note: ***, ** and * denotes significant level at 1%, 5% and 10%, respectively. p-value in parentheses.

Table 4: The Role of Financial Development in FDI-Growth Nexus: Static Panel (without split sample) (Dependent Variable: GDP)

	Without Interaction			**With Interaction**			**Linear specification with dummy**		
	POLS	FE	RE	POLS	FE	RE	POLS	FE	RE
GFC	0.004	0.002	0.004	0.003	0.001	0.003	0.024	0.023	0.024
INF	0.304***	0.310***	0.304***	0.304***	0.310***	0.304***	0.350***	0.357***	0.350***
FCAPITAL	0.084***	0.083***	0.084***	0.083***	0.082***	0.083***	0.093***	0.092***	0.093***
HC	0.038***	0.025*	0.038***	0.037***	0.025*	0.037***	0.060***	0.047***	0.060***
FDI	0.001	0.001	0.001	-0.963**	-0.994**	-0.963**	-	-	-
FinDev	0.747***	1.018***	0.991***	0.747***	0.766***	0.747***	-	-	-
FDI X FinDev	-	-	-	0.209**	0.215**	0.209**	-	-	-
FDI – Quartile 1	-	-	-	-	-	-	0.012	0.011	0.012
FDI – Quartile 2	-	-	-	-	-	-	0.019*	0.018*	0.019*
FDI – Quartile 3	-	-	-	-	-	-	0.017**	0.016**	0.017**
FDI – Quartile 4	-	-	-	-	-	-	-0.017**	-0.016**	-0.017**
Constant	1.053*	0.948*	1.053*	2.185***	2.114***	2.185***	5.285***	5.296***	5.285***
R^2	0.700	0.701	0.701	0.703	0.704	0.703	0.677	0.678	0.677
F-test		2075.96 (0.000)			2001.57 (0.000)			1674.41 (0.000)	
LM test			2768.62 (0.000)			2630.51 (0.000)			2552.82 (0.000)
Hausman test			34.75 (0.000)			32.12 (0.000)			40.37 (0.000)

Note: ***, ** and * denotes significant level at 1%, 5% and 10%, respectively. p-value in parentheses.

Table 5: Country specific effect (intercept differential)

Rank	Country	Effect	Rank	Country	Effect	Rank	Country	Effect
1	Korea, Rep.	2.443	23	Peru	0.681	45	Sudan	-0.628
2	Mexico	1.605	24	Albania	0.629	46	Lesotho	-0.643
3	Turkey	1.575	25	Thailand	0.625	47	Pakistan	-0.645
4	Malaysia	1.287	26	Jordan	0.447	48	Senegal	-0.656
5	South Africa	1.286	27	Guatemala	0.415	49	Moldova	-0.673
6	Botswana	1.276	28	China	0.384	50	Vietnam	-0.733
7	Russia	1.265	29	Morocco	0.272	51	Kenya	-0.937
8	Mauritius	1.258	30	Ukraine	0.129	52	Ghana	-0.960
9	Panama	1.252	31	Paraguay	0.080	53	Cambodia	-0.974
10	Costa Rica	1.215	32	Armenia	0.054	54	Bangladesh	-1.016
11	Brazil	1.177	33	Honduras	-0.048	55	Benin	-1.036
12	Romania	1.150	34	Indonesia	-0.051	56	Tanzania	-1.107
13	Dominican Rep.	1.005	35	Egypt	-0.068	57	Mali	-1.197
14	Namibia	0.962	36	Sri Lanka	-0.071	58	Sierra Leone	-1.362
15	Belize	0.891	37	Philippines	-0.148	59	Togo	-1.372
16	Colombia	0.850	38	Nicaragua	-0.195	60	Uganda	-1.387
17	Kazakhstan	0.845	39	Bolivia	-0.255	61	Mozambique	-1.399
18	Serbia	0.829	40	Guyana	-0.274	62	Nepal	-1.446
19	Tunisia	0.819	41	Mongolia	-0.388	63	Niger	-1.749
20	Ecuador	0.721	42	Cote d'Ivoire	-0.430	64	Malawi	-1.802
21	El Salvador	0.720	43	Cameroon	-0.490	65	Congo, Dem. Rep.	-1.815
22	Algeria	0.691	44	India	-0.592	66	Burundi	-2.288

4. CONCLUSION

This study examines the impact of foreign direct investment on economic growth via financial development among 66 selected developing countries. The study uses panel data by pooling the time series and cross-sectional data. The use of panel data is appropriate in this study since we can increase the data points and the degree of freedom, thereby providing a most robust estimation. Hausman test result indicates fixed effect model is said to be the appropriate model compared to random effect model. The fixed effect model result demonstrated that foreign direct investment inflow has negative but insignificant relationship on economic growth in the estimation of the model without interaction. However, foreign direct investment becomes positively significant relationship with economic growth if interacted with financial development. FDI accelerate economic growth depend on the level of financial development as shown at Table 4. The higher level of financial development the higher FDI can promote economic growth. The performance illustrated at Figure 1. The results from Table 5 show the country specific effect to indicate the most efficient country which foreign direct investment and financial development promote economic growth. We can conclude that foreign direct investment can accelerate economic growth depends on the level of financial development. Thus, all countries need higher financial development to contribute to foreign direct investment to increase economic growth.

REFERENCES

Adeniyi O. and Omisakin (2012) Foreign Direct Investment, Economic Growth and Financial Sector Development in Small Open Developing Economies. Economic Analysis & Policy, Vol. 42 (1), 105–127.

Aghion, P. & Howitt, P. (1992). A model of growth through a creative destruction. *Econometrica.* 60(2): 323-351.

Alfaro, L., Chanda, A., Kalemli-Ozcan, S. & Sayek, S. (2004). FDI and economic growth: the role of local financial markets. *Journal of International Economics* 64: 89-112.

Alfaro, L., Kalemli-Ozcan, S. & Sayek, S. (2009). FDI, productivity and financial development. *The World Economy* 32(1): 111-135.

Azman-Saini, W. N. W., Law, S. H. & Abdul Halim, A. (2010). FDI and economic growth: new evidence of the role of financial markets. *Economics Letters* 210: 211-213.

Ang, J. B. (2009). Foreign direct investment and its impact on the Thai economy: the role of financial development. *Journal of Economics and Finance* 33: 316-323.

Carkovic, M. and Levine, R. (2002) Does Foreign Direct Investment Accelerate Economic Growth? *University of Minnesota Department of Finance Working Paper*.

Chakraborty, C. & Nunnenkamp, P. 2008. Economic reforms, FDI and economic growth in India: a sector level analysis. *World Development* 36(7): 1192-1212.

Choong, C. K. (2012). Does the domestic financial development enhance the linkages between foreign direct investment and economic growth? *Empirical Economics* 42: 819-834.

Gao, T. (2005). Foreign direct investment and growth under economic integration. *Journal of International Economics* 67: 157-174.

Goh, Soo Khoon, et. al (2013). Trade linkages of inward and outward FDI: Evidence from Malaysia. Economic Modelling 35, page 224–230.

Helpman, E. (1984). A simple theory of trade with multinational corporations. Journal of Political Economy 92, 451–471

Hermes, N. & Lensik, R. (1996). *Financial Development and Economic Growth: Theory and Experiences from Developing Countries*. Oxon, UK: Routledge.

Hermes, N. & Lensink, R. (2003). Foreign direct investment, financial development and economic growth. *The Journal of Development Studies* 40(1): 142-163.

Iamsiraroj, S. & Ulubaşoğlu, M.A. (2015) Foreign direct investment and economic growth: A real relationship or wishful thinking? Economic Modelling 51: 200-2013.

Law, S.H. and Singh, N. (2014). Does too much finance harm economic growth? *Journal of Banking & Finance 41*: 36-44.

Lee, Chien-Chiang & Chang, Chun-Ping (2009). FDI, financial development and economic growth: international evidence. *Journal of Applied Economics* 12(2): 249-271.

Levine, R. (1997). Financial development and economic growth: views and agenda. *Journal of Economic Literature* 35: 688-726.

Levine, R. (2005). *Finance and growth: theory & evidence*, in Aghion, P. & Durlaff, S. (eds), Handbook of economic Growth. Elsevier Science. The Netherlands.

Liu, Z. (2008.) Foreign direct investment and technology spillovers: theory and evidence. *Journal of Development Economics* 85: 176-193.

Markusen, J.R., 1984. Multinationals, multi-plant economics, and the gains from trade. Journal of International Economics 16, 205–226.

Markusen, J.R., Venables, A.J. (1995). Multinational Firms and the New Trade Theory NBER Working Paper, No. 5036. NBER, Cambridge.

Samargandi, N. et. al (2014) Is the Relationship Between Financial Development and Economic Gowth Monotonic? Evidence from a Sample of Middle-Income Countries, *World Development*. 68: 66-81.