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Relationship between Financial Development and Foreign Direct Investment

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Abstract

This study examines the relationship between foreign direct investment (FDI) and financial development (FD) based on a sample of 93 countries including high-income, upper middle-income and low-income countries. The estimation results for the entire sample indicate that FDI is beneficial instrument to enhance the speed of FD. The empirical results for the high-income countries indicate that FDI stimulates only the loan sector and does not have a significant effect on domestic credit for the private sector. The empirical results for upper middle-income countries show that FDI can speed up the FD of upper middle-income countries. Finally, the results for low-income countries indicate that the effects of both FDI on both the domestic credit sector and domestic credit for private financial sector of FD are unclear and inconsistent.

Keywords: Financial Development, Foreign Direct Investment, Domestic Investment, Arellano Bond (1991), Dynamic Panel GMM Estimation

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1 Introduction

It is widely accepted that a developed financial system can efficiently collect and mobilize financial resources from households to the business and investment sectors. Many scholars share the perspective that a developed and well-functioning financial sector is an important mechanism for long-term economic growth (Levine, 2003; Demetriades and Andrianova, 2004) because a financial system can provide important services to an economy. Since different countries have different levels of financial development (FD), economists have attempted to analyze the determinants of financial sector development. Certain studies have attempted to determine why certain countries are more financially developed than others, while other studies investigate which legal and regulatory environments facilitate FD. For example, Beck (2003) and Do and Levchenko (2004) provide insights regarding the different levels of FD across economies by showing that openness encourages FD in rich nations while restricting FD in poor nations. In addition, Rajan and Zingales (2003) suggest that the simultaneous opening of both the trade and financial sectors is a key to successful FD.

Most developing countries have a low level of FD since they do not have sufficient investment resources. Thus, developing economies attempt to attract foreign capital to their economies. Conversely, developed have high level FD since they open their economic and financial sector and can attract foreign capital due to their good investment environment. There are two types of foreign capital, namely, foreign direct investment (FDI) and foreign portfolio investment (FPI). Of these two types, FDI fosters long-term economic development and developed economic performances shape the respective financial systems to be active in order to meet the demands on financial sources. In addition, certain studies state that FDI can have important positive effects on a host country's FD because it can enhance technological change through the spillover effects of knowledge and new capital goods. For example, Levin (1997) argues that FDI inflows contribute

to the FD of host countries because those inflows supply direct capital financing to the financial system. Conversely, certain studies state that FDI has no effect on FD and that occasionally; FDI is a threat to the FD of the host country (e.g., Desbordes & Wei, 2014). Ann et al. (2002) find that incoming foreign investment in developing countries can worsen domestic credit constraints. Hence, empirical results regarding the impact of FDI on the development of financial systems are mixed; it is still interesting to examine the relationship between FDI and FD.

Certain studies examine the interactions between the impacts of FDI and FD in the context of economic growth (e.g., Alfaro et al., 2004); however, little attention has been paid to the impact of FDI on FD. Therefore, this study tries to make cross county analysis based on the different income levels. Figures 1.1 and 1.2 shows the financial sector development and investment conditions of the 93 selected economies.

The objective of this study is to investigate the relationship between FDI and financial sector development. We focus on the following research questions: Does FDI matter for financial sector development not only all countries but also by the income group? , and What is the role of capital formation in the financial development?

This study uses two important indicators of FD, the ratio of domestic loans to GDP and the ratio of private sector credit to GDP. We include the ratio of total FDI to GDP to account for the role of external factors in determining the FD of an economy. FDI includes direct investments made by foreign countries and direct investments made by business and individuals in other countries. This study uses the total value of FDI inflow and FDI outflow in order to catch up the FDI openness of each country. The ratio of capital formation to GDP is also considered in our analysis. Capital formation represents gross capital investment in fixed assets and changes in the level of inventories in an economy. This study analyzes 93 developed and developing countries

from 1996 to 2015. Our empirical approach involves regressing two FD indicators by applying the dynamic generalized method of moments (GMM) developed by Arellano and Bond (1991).

This paper is organized into five sections: section two reviews previous studies, section three describes the data and methodology, and section four presents and discusses the empirical results. Finally, section five provides a summary and concludes the study.

Figure1.1 Financial Sector Development (For Entire Sample)

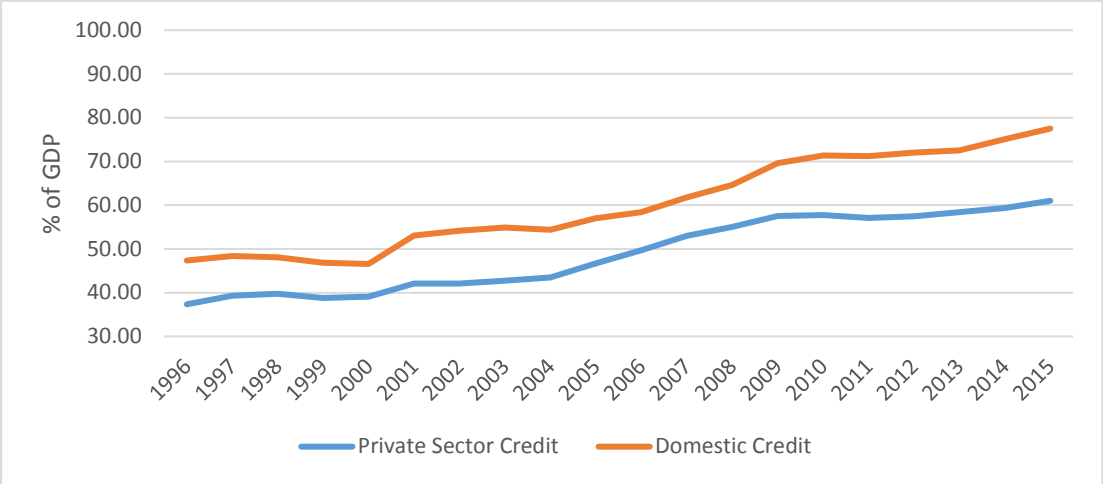
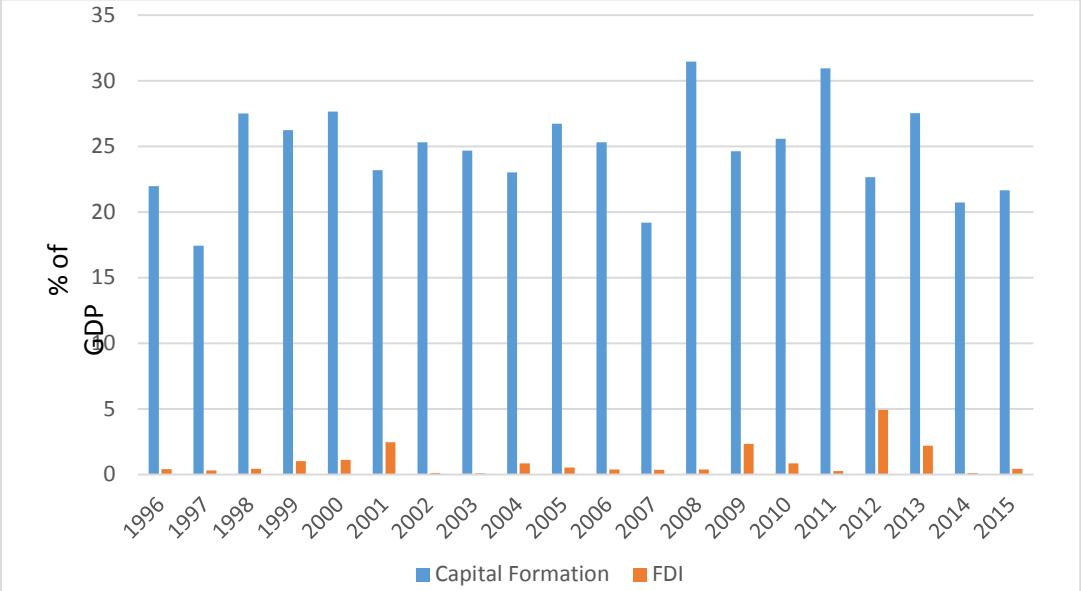


Figure 1.2 FDI and Capital Formation (For Entire Samples)



2 Literature review

This section summarizes the theoretical background of FDI and FD and a review of selected studies regarding the measurement of both FD and FDI and the relationship between FD and FDI.

2.1 Theoretical Background

Alfaroa et al., (2004) state that FDI is associated with faster growth in host countries. FDI is generally categorized as being foreign enterprises which do the business in a foreign country by taking the role of full ownership and joint venture by cooperating with a domestic business which is already operation in the host country's economy. FDI commonly comes in these ways and make businesses. And domestic business enhances their efficiencies in doing business in order to compare with foreign companies. Consequently, the economic sector becomes more active due to the FDI. Therefore, Carkovic et al., (2002) say that FDI accelerate the economy.

Entrepreneurs in an active economy stimulates the financial system by finding financial sources form the banks. Joan Robinson (1952) declares that economic development creates demands for particular types of financial arrangements, and the financial system responds to these demands. According to the above suggestions, we can assume that FDI makes the domestic market more active and market performances force the financial market to surge the efficiency of financial sector to meet the market demands.

2.2 Measurement of FD

Analyzing FD from the perspective of foreign investment requires measuring FD. Several measures of FD have been applied in prior studies, such as the ratio of liquid liabilities of the financial system to GDP (Levine et al.,2000), the ratio of deposits to GDP (Rajan and Zingales, 2003), the ratio of credit to GDP (Arcand et al., 2012), the ratio of private credit to GDP (Levine

et al., 2000; Baltagi et al., 2009), and the ratio of stock market capitalization to GDP (Rajan and Zingales, 2003; Baltagi et al., 2009). By definition, total credit to GDP represents the extent of FD, and private credit to GDP represents the efficiency of FD.

Cihak et al. (2012) measure FD by considering size, access, efficiency and stability. Svirydzenka (2016) further extends the work of Cihak et al. (2012) by constructing nine indices of FD, namely, the aggregate FD index, the financial institution development index, the financial market development index, financial institution depth, financial institution access, financial institution efficiency, financial market depth, financial market access, and financial market efficiency for 183 countries from 1993 to 2003.

2.3 Measurement of FDI

Like the FD, FDI have also been applied in prior studies. Jonathan Munemo (2016) apply Net FDI Inflow with the aim to identify the net effect of FDI inflow and outflow. Bornschier et al., (1978) employ Flow FDI based on inflows or outflows of foreign capital in a country and Stock FDI which measures the total cumulated valued of foreign capital in a country in order to approach FDI form both stock perspective and flow perspective. Konstantin (2013) uses total amount of FDI inflows and outflow to know the FDI openness of an economy.

2.4 FD and FDI

Single country and cross-country studies have been conducted to investigate the role of FDI on financial sector development. Abzari et al. (2011) find that FDI improves the FD of D-8 countries. Nasser and Gomez (2009) show that there is a positive relationship between FDI and FD. In addition, Seghir (2009) state that domestic and foreign investments improve the development of financial markets in Tunisia. Moreover, Jonathan Munemo (2016) show that FDI stimulates business entrepreneurship and FD. Kose et al. (2006) state that financial opening and the resulting inflows of FDI could lead to an increase in total factors of production via knowledge spillovers, technology transfers and the fostering of linkages with domestic firms, depending on

the local conditions. Joan Robinson (1952) declares that economic development creates demands for particular types of financial arrangements, and the financial system automatically responds to these demands.

Sghaier and Abida (2013) argue that FDI granger causes FD. Dutta and Roy (2011) show that FDI stimulates FD up to a specific level of FDI flows, but they also reveal that after this threshold, FDI hinders FD. Ann et al. (2002) find that incoming foreign investment in developing countries can worsen domestic credit constraints. Desbordes and Wei (2014) state that FDI promotes FD only in financially vulnerable sectors. Although these studies report mixed results, the majority of studies note that FDI encourages the development of financial systems.

3 Data and Methodology

3.1 Data

We collect annual data on developed and developing countries from 1996 to 2015. The list of countries is provided in Appendix 1. To determine financial sector development, we apply the ratio of private sector credit to GDP and the ratio of domestic credit to GDP and consider the efficiency and size of the banking sector. We employ FDI and capital formation variables. These variables evaluate both foreign and domestic investment. We also use the ratio of total trade to GDP to measure trade openness. Furthermore, we control for other macroeconomic variables that are likely to affect FD. Data on domestic credit provided by the financial sector, domestic credit to the private sector, the ratio of total trade to GDP, the ratio of gross fixed capital formation and real GDP are obtained from World Development Indicators (WDI). For the real interest rate, we use data from the International Monetary Fund (IMF) International Financial Statistics (IFS), and for FDI and property rights, we use data from the Global Economy database. Tables 3.1, 3.2 and 3.3 present brief descriptions of the definitions, sources and descriptive statistics of variables used in our empirical analysis.

3.2 Empirical Model

We estimate the following dynamic panel model for FD:

$$FD_{i,t} = \beta_0 + \beta_1 FD_{i,t-1} + \beta_2 FDI_{i,t} + \beta_3 DI_{i,t} + \beta_4 TO_{i,t} + \beta_5 RGDP_{i,t} + \beta_6 INT_{i,t} + \beta_7 PRIG_{i,t} + \alpha_i + \varepsilon_{i,t}$$

where $FD_{i,t}$ is the FD for country i at time t, $FDI_{i,t}$ represents FDI , $FDI_{i,t-1}$ is the value of FD in the previous period, $DI_{i,t}$ is domestic investment, $TO_{i,t}$ represents trade openness, $RGDP_{i,t}$ is the real gross domestic product, $INT_{i,t}$ represents the real interest rate, $PRIG_{i,t}$ represents property rights as a proxy of the legal system, α_i is a time-invariant unobservable variable and $\varepsilon_{i,t}$ is a time-varying unobservable variable.

For the estimation methodology, we apply the GMM proposed by Arellano and Bond (AB, 1991), which represents one type of dynamic panel data estimations that examines the effects of investment on FD. We use a one-step GMM for the estimation to decrease bias and improve efficiency. Since the lag of the dependent variable is considered an independent variable in the model, there is a correlation between that lag variable and the time-invariant error term. When the unobservable and observable variables are correlated, there is an endogeneity problem, which indicates that the parameter estimation is inconsistent. To solve this problem, we first calculate the differences of the equation as follows.

$$\Delta FD_{i,t} = \beta_1 \Delta FD_{i,t-1} + \sum_k \beta_k \Delta X_{k,i,t} + \Delta \varepsilon_{i,t}$$

The first equation can remove the time-invariant unobservable variable that is correlated with repressors; then, we obtain a new endogeneity problem.

$$E(\Delta FD_{i,t-1} \quad \Delta \varepsilon_{it}) \neq 0$$

To solve this problem, Arellano-Bond suggests including the second lags of the dependent variables and all feasible lags thereafter. This generates the set of moment conditions defined by

$$E\left(\Delta FD_{i,t-2} \quad \Delta\varepsilon_{it}\right) = 0$$

$$E\left(\Delta FD_{i,t-3} \quad \Delta\varepsilon_{it}\right) = 0$$

$$E\left(\Delta FD_{i,t-j} \quad \Delta\varepsilon_{it}\right) = 0$$

The set of instruments in the Arellano-Bond test is as follows:

$$E\left(\Delta FD_{i,t-j} \quad \Delta\varepsilon_{it}\right) = 0 \quad j \geq 2$$

The unobservable error is the serially correlated of order 1, but not the serially correlated of order 2 or beyond. Along with the regression results, we report the first- and second-order autocorrelation tests (AR1 and AR2).

Table 3.1 Summary of the variables and data sources

Variable	Description	Source
Loan	Domestic credit provided by financial sector (% of GDP)	World Bank's WDI
Private Sector Credit	Domestic credit to private sector (% of GDP)	World Bank's WDI
FDI	Sum of Foreign Liabilities (Direct Investment) and Foreign Assets (Direct Investment) – (% of GDP)	IMF' International Financial Statistics
Capital Formation	Gross fixed capital formation (formerly gross domestic fixed investment) includes land improvements (fences, ditches, drains, and so on); plant, machinery, and equipment purchases; and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings.	World Bank's WDI
Trade Openness	Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product	World Bank's WDI
Property Rights	An index which represents a country's laws protects private property rights and the degree to which its government enforces those laws.	TheGlobalEconomy.com, The Heritage Foundation
Real GDP per Capita	GDP at market prices (constant 2000 US$)	World Bank's WDI
Real Interest Rate	Real interest rate (%)	IMF's International Financial Statistics

Table 3.2 Descriptive statistics and correlation of the variables (All samples)

Variable	Obs	Mean	Std. Dev.	Min	Max
Domestic Credit (% of GDP)	2,773	60.256	56.586	-79.092	357.319
Private Sector Credit (% of GDP)	2,773	48.976	44.485	0.001	312.118
FDI (% of GDP)	1,684	1.437	10.657	-0.037	230.269
Capital Fromation(% of GDP)	2,654	24.119	10.961	-2.424	219.069
TO (% of GDP)	2,752	87.312	53.078	0.167	531.737
Log of Real GDP	2,793	24.213	2.362	19.396	30.440
Property Rights	2,475	49.560	23.642	5.000	95.000
Real Interest Rate	2,387	7.050	11.023	-94.220	93.937

Table 3.2 Correlations

	Domestic Credit (% of GDP)	Private Sector Credit (% of GDP)	FDI (% of GDP)	Capital Format-ion (% of GDP)	TO (% of GDP)	Log of Real GDP	Property Rights	Real Interest Rate
Domestic Credit (% of GDP)	1.000							
Private Sector Credit (% of GDP)	0.940	1.000						
FDI (% of GDP)	0.053	0.063	1.000					
Capital Formation (% of GDP)	-0.050	0.008	0.044	1.000				
TO (% of GDP)	0.112	0.220	0.138	0.079	1.000			
Log of Real GDP	0.539	0.474	-0.131	-0.021	-0.205	1.000		
Property Rights	0.590	0.624	0.014	-0.104	0.235	0.418	1.000	
Real Interest Rate	-0.100	-0.109	-0.011	-0.119	-0.121	-0.098	-0.034	1.000

4 Empirical Results and Discussion

4.1 Results

To investigate the relationship between FD and FDI, we use the GMM proposed by Arellano and Bond (AB, 1991), which can be used to conduct dynamic panel data estimations. The results are presented in Tables 4.1 to 4.8. We try to estimate the relationship between FDI and FD based two different conditions. For the condition (1), we treat all independent variables except the value of FD in the previous period as the exogenous (Lagged) variables. For the second condition,

we treat property right as the exogenous variable and the rest of the independent variables are treated as the endogenous variables.

The estimation results for the entire sample of countries are presented in Tables 4.1 and 4.5; generally, the results indicate that FDI promotes FD. Capital formation is a beneficial instrument to accelerate the process of FD since the coefficients of domestic investment are positively significant. Tables 4.2 and 4.6 explain the empirical results for the high-income countries, which indicate that FDI stimulates only the loan sector and does not show any significant effect on domestic credit to the private sector. The empirical results regarding upper middle-income countries are presented in Tables 4.3 and 4.7; the results show that FDI has a significant effect on the FD of upper middle-income economies. Finally, Tables 4.4 and 4.8 show the results for low-income countries. Both the effects of FDI and capital formation on the loan sector of FD are unclear and inconsistent, while FDI and capital formation generally encourage domestic credit to the private sector of FD.

4.2 Interpretation and Discussion on the Results

According to the results showed in Tables 4.1 to 4.8, we can interpret for the entire sample that FDI inflows and outflows stimulate FD. After classifying countries based on income levels, the results show that there is positive relationship between FDI and FD in high-income countries, upper-middle income countries. High-income countries are developed countries and most of the upper middle-income countries are emerging economies. Therefore, we can interpret that the developed countries make their financial sector more active and developed by attracting the FDI inflows to their economies. And if we consider form the FDI outflow side, when those developed countries try to make investments in the foreign countries, we can say they just depend on their own domestic financial sector to finance the required capital to make foreign investments.

Most of the lower middle and low-income countries are developing countries. Analyzing for lower middle and low-income countries, there is no clear result about the relation between the FDI and FD for the loan sector. For the domestic credit for private sector, FDI has negative impact on FD. Therefore, we can interpret that most developing countries do not have sufficient investment resources to attract the foreign direct investment. Foreign Investors are not interest to move their capital to the developing due to weak and unstable economic environment.

We want to discuss on the case of lower middle and low-income countries. In order to invite FDI, developing countries should try to have good financial infrastructure such as strong legal system to protect the property rights of investors. Moreover, developing countries should prepare domestic business to be able to compete with foreign enterprises and allow domestic firms to finance easily form the banks. In order to protect the risks of financial and economic instabilities due to the dramatic amount of capital inflows and outflows, developing countries should also set up some prudential regulations related to FDI.

Table 4.1 (All countries) The Result of Arellano Bond Dynamic Panel GMM Estimation
Dependent Variable: Financial Development (Loan: Domestic Credit)

	(1)	**(2)**
	All Countries	All Countries

	LOAN	LOAN
L.LOAN	0.868***	0.859***
	(0.026)	(0.025)
FDI	0.655**	0.924**
	(0.326)	(0.468)
L. FDI	-0.568	-0.606
	(0.489)	(0.487)
L2. FDI	-0.087	-0.121
	(0.408)	(0.389)
Capital Formation	0.474**	0.196
	(0.240)	(0.190)
L. Capital Formation	0.190*	0.181
	(0.109)	(0.111)
L2. Capital Formation	0.184**	0.054
	(0.094)	(0.084)
PR (Property Right)	0.112	-0.089
	(0.084)	(0.070)
TO (Trade Openness)	-0.105	-0.027
	(0.076)	(0.056)
RGDP (Real GDP)	15.079***	7.857**
	(4.449)	(3.126)
RINT (Real Interest Rate)	0.404***	0.370***
	(0.071)	(0.070)
Constant	-381.621***	-194.075**
	(112.061)	(78.757)
Treatment of Variables	Lagged	Enodgenous
Number of observation	1074	1074
Number of time periods(T)	20	20
Number of countries(N)	93	93
First order serial correlation test (p-value)	0.000	0.000
Second order serial correlation test (p-value)	0.358	0.428
Robust standard errors are in parentheses		
***p<0.01, **p<0.05, *p<0.1		

Table 4.2 (High Income) The Result of Arellano Bond Dynamic Panel GMM Estimation
Dependent Variable: Financial Development (Loan: Domestic Credit)

	(1)	**(2)**

	High Income	High Income
	LOAN	LOAN
L.LOAN	0.873***	0.881***
	(0.041)	(0.028)
FDI	0.862**	0.680
	(0.378)	(0.421)
L. FDI	-0.524	-0.590
	(0.506)	(0.531)
L2. FDI	0.108	-0.016
	(0.533)	(0.454)
Capital Formation	0.949	0.661
	(0.578)	(0.554)
L. Capital Formation	0.342	0.327
	(0.234)	(0.221)
L2. Capital Formation	0.392**	0.147
	(0.187)	(0.229)
PR (Property Right)	0.285	-0.294*
	(0.198)	(0.157)
TO (Trade Openness)	-0.034	0.022
	(0.094)	(0.057)
RGDP (Real GDP)	21.305***	11.671**
	(8.034)	(5.722)
RINT (Real Interest Rate)	0.528***	0.579***
	(0.110)	(0.073)
Constant	-587.559***	-319.459**
	(210.833)	(144.887)
Treatment of Variables	Lagged	Enodgenous
Number of observation	501	501
Number of time periods(T)	20	20
Number of countries(N)	37	37
First order serial correlation test (p-value)	0.002	0.002
Second order serial correlation test (p-value)	0.267	0.299

Robust standard errors are in parentheses
*****p<0.01, **p<0.05, *p<0.1**

Table 4.3 (Upper Middle Income) The Result of Arellano Bond Dynamic Panel GMM Estimation
Dependent Variable: Financial Development (Loan: Domestic Credit)

	(1)	(2)
	Upper Middle	**Upper Middle**
	LOAN	LOAN
L.LOAN	0.734***	0.782***
	(0.048)	(0.035)
FDI	12.438**	10.925**
	(5.475)	(4.833)
L. FDI	8.682*	8.911*
	(5.083)	(5.154)
L2. FDI	2.838	1.348
	(3.966)	(3.393)
Capital Formation	0.059	0.041
	(0.121)	(0.100)
L. Capital Formation	0.140	0.193
	(0.139)	(0.127)
L2. Capital Formation	0.093	0.011
	(0.058)	(0.074)
PR (Property Right)	0.019	0.041
	(0.081)	(0.079)
TO (Trade Openness)	-0.050	-0.041
	(0.046)	(0.040)
RGDP (Real GDP)	7.830*	8.508***
	(4.703)	(3.180)
RINT (Real Interest Rate)	0.290***	0.224***
	(0.059)	(0.077)
Constant	-189.675	-203.637***
	(117.406)	(78.304)
Treatment of Variables	Lagged	Enodgenous
Number of observation	322	322
Number of time periods(T)	20	20
Number of countries(N)	27	27
First order serial correlation test (p-value)	0.021	0.024
Second order serial correlation test (p-value)	0.761	0.664

Robust standard errors are in parentheses
*****p<0.01, **p<0.05, *p<0.1**

Table 4.4 (Lower Middle and Low Income) The result of Arellano Bond Dynamic Panel GMM Estimation

Dependent Variable: Financial Development (Loan: Domestic Credit)

	(1)	**(2)**
	Low Income	Low Income
	LOAN	LOAN
L.LOAN	0.709***	0.804***
	(0.052)	(0.038)
FDI	-4.989	-0.884
	(3.901)	(3.247)
L. FDI	8.254***	7.897**
	(2.985)	(3.652)
L2. FDI	-6.145**	-6.878***
	(2.747)	(2.511)
Capital Formation	-0.166**	-0.107
	(0.077)	(0.066)
L. Capital Formation	0.161	0.174
	(0.153)	(0.162)
L2. Capital Formation	0.149	0.093
	(0.125)	(0.121)
PR (Property Right)	-0.016	0.010
	(0.045)	(0.064)
TO (Trade Openness)	-0.015	-0.041
	(0.033)	(0.033)
RGDP (Real GDP)	8.938***	5.616**
	(2.565)	(2.235)
RINT (Real Interest Rate)	0.144**	0.089
	(0.072)	(0.069)
Constant	-200.238***	-124.370**
	(60.146)	(52.497)
Treatment of Variables	Lagged	Enodgenous
Number of observation	251	251
Number of time periods(T)	20	20
Number of countries(N)	28	28
First order serial correlation test (p-value)	0.004	0.005
Second order serial correlation test (p-value)	0.860	0.738
Robust standard errors are in parentheses		
*****p<0.01, **p<0.05, *p<0.1**		

Table 4.5 (All countries) The Result of Arellano Bond Dynamic Panel GMM Estimation
Dependent Variable: Financial Development (Private Sector Credit)

	(1)	**(2)**
	All Countries	All Countries
	PSC	PSC
L.PSC	0.758***	0.834***
	(0.044)	(0.026)
FDI	0.827**	0.619
	(0.378)	(0.378)
L. FDI	-0.106	-0.246
	(0.222)	(0.256)
L2. FDI	-0.650***	-0.446**
	(0.249)	(0.188)
Domestic Investment	0.659**	0.397*
	(0.281)	(0.224)
L. Domestic Investment	0.064	-0.004
	(0.117)	(0.148)
L2. Domestic Investment	0.013	-0.036
	(0.067)	(0.075)
PR (Property Right)	0.051	0.042
	(0.067)	(0.057)
TO (Trade Openness)	-0.055	-0.005
	(0.067)	(0.050)
RGDP (Real GDP)	11.935***	7.900***
	(3.860)	(2.404)
RINT (Real Interest Rate)	0.270***	0.228***
	(0.058)	(0.060)
Constant	-299.448***	-196.898***
	(98.596)	(61.582)
Treatment of Variables	Lagged	Enodgenous
Number of observation	1074	1074
Number of time periods(T)	20	20
Number of countries(N)	92	92
First order serial correlation test (p-value)	0.013	0.0089
Second order serial correlation test (p-value)	0.265	0.2732
Robust standard errors are in parentheses		
*****p<0.01, **p<0.05, *p<0.1**		

Table 4.6 (High countries) The Result of Arellano Bond Dynamic Panel GMM Estimation
Dependent Variable: Financial Development (Private Sector Credit)

	(1)	**(2)**
	High Income	High Income
	PSC	PSC
L.PSC	0.789***	0.859***
	(0.059)	(0.029)
FDI	0.649	0.485
	(0.470)	(0.354)
L. FDI	-0.052	-0.165
	(0.235)	(0.246)
L2. FDI	-0.406	-0.429**
	(0.284)	(0.218)
Domestic Investment	1.316*	1.001
	(0.700)	(0.659)
L. Domestic Investment	0.177	0.060
	(0.359)	(0.389)
L2. Domestic Investment	0.109	-0.198
	(0.181)	(0.222)
PR (Property Right)	0.101	0.121
	(0.156)	(0.126)
TO (Trade Openness)	0.040	0.040
	(0.084)	(0.058)
RGDP (Real GDP)	14.863***	7.266*
	(4.813)	(4.085)
RINT (Real Interest Rate)	0.396***	0.369***
	(0.068)	(0.062)
Constant	-419.575***	-198.025*
	(130.168)	(106.050)
Treatment of Variables	Lagged	Enodgenous
Number of observation	501	501
Number of time periods(T)	20	20
Number of countries(N)	37	37
First order serial correlation test (p-value)	0.035	0.0279
Second order serial correlation test (p-value)	0.276	0.2776
Robust standard errors are in parentheses		
*****p<0.01, **p<0.05, *p<0.1**		

Table 4.7 (Upper Middle countries) Result of Arellano Bond Dynamic Panel GMM Estimation
Dependent Variable: Financial Development (Private Sector Credit)

	(1)	**(2)**
	Upper Middle	Upper Middle
	PSC	PSC
L.PSC	0.768***	0.780***
	(0.055)	(0.039)
FDI	7.339	9.214**
	(5.349)	(4.062)
L. FDI	-3.126	-3.571
	(3.007)	(3.162)
L2. FDI	-1.419	-1.476
	(3.113)	(3.387)
Domestic Investment	0.264***	0.097
	(0.095)	(0.087)
L. Domestic Investment	0.056	0.076*
	(0.040)	(0.045)
L2. Domestic Investment	-0.003	-0.041
	(0.065)	(0.073)
PR (Property Right)	-0.009	-0.017
	(0.106)	(0.104)
TO (Trade Openness)	-0.083**	-0.029
	(0.040)	(0.027)
RGDP (Real GDP)	5.049	8.180***
	(4.273)	(3.071)
RINT (Real Interest Rate)	0.130**	0.097**
	(0.053)	(0.045)
Constant	-113.631	-196.381***
	(106.811)	(74.734)
Treatment of Variables	Lagged	Enodgenous
Number of observation	371	322
Number of time periods(T)	20	20
Number of countries(N)	27	27
First order serial correlation test (p-value)	0.0125	0.0233
Second order serial correlation test (p-value)	27	0.7907
Robust standard errors are in parentheses		
*****p<0.01, **p<0.05, *p<0.1**		

Table 4.8 (Lower Middle + Low countries) The Result of Arellano Bond Dynamic Panel GMM Estimation
Dependent Variable: Financial Development (Private Sector Credit)

	(1)	**(2)**
	Low Income	Low Income
	PSC	PSC
L.LOAN	0.750***	0.829***
	(0.045)	(0.032)
FDI	-2.809	-1.150
	(4.522)	(3.507)
L. FDI	2.227	1.449
	(3.254)	(2.981)
L2. FDI	-3.838	-3.694
	(2.544)	(2.372)
Domestic Investment	0.104	0.090
	(0.083)	(0.076)
L. Domestic Investment	0.127	0.127
	(0.107)	(0.105)
L2. Domestic Investment	0.025	-0.017
	(0.069)	(0.069)
PR (Property Right)	0.016	-0.035
	(0.045)	(0.032)
TO (Trade Openness)	-0.039	-0.021
	(0.043)	(0.029)
RGDP (Real GDP)	8.429***	4.543*
	(2.575)	(2.358)
RINT (Real Interest Rate)	0.094	0.083
	(0.067)	(0.065)
Constant	-193.368***	-100.074*
	(59.872)	(55.344)
Treatment of Variables	Lagged	Enodgenous
Number of observation	251	251
Number of time periods(T)	20	20
Number of countries(N)	28	28
First order serial correlation test (p-value)	0.006	0.005
Second order serial correlation test (p-value)	0.953	0.936
Robust standard errors are in parentheses		
*****p<0.01, **p<0.05, *p<0.1**		

5 Conclusions

This section summarizes the results of the empirical analysis. The following research questions were investigated to develop policies to enhance economic sustainability through improved financial management:

1. Does FDI matter for financial sector development not only all countries but also by the income group?
2. What is the role of capital formation in the financial development?

The results of the analysis indicate that capital formation plays an important role in determining financial sector development for the entire sample analysis; however, FDI has strong effect on financial sector development for full size, high-income countries and upper middle-income countries. However, the results regarding the relationship between FDI and FD in lower- and low-income countries are unclear.

Therefore, we can conclude that high-income and upper middle-income countries can manage FDI flows very well and take the advantages by opening up FDI inflows and outflows due to their good economic conditions and financial infrastructures. However, lower middle and low-income countries don't generally have good investment environment and financial infrastructure and so cannot attract to the FDI and the existing FDI may go out at any time due to weak political and socioeconomics conditions. Therefore, developing countries can suffer from the capital outflow at any time and it can impose negative effect on the financial development. Due to the above reasons, we can conclude that there is negative relationship between FDI and FD for lower middle and low-income countries.

5.1 Limitations of the Study

This study analyzes the relationship between FD and economic growth in 93 countries by using annual panel data for 1996 to 2015. However, this study includes certain limitations.

1. This study only considers the short period from 1996 to 2015. The analysis may be improved if we consider a longer period.
2. This study analyzes financial sector development in the banking sector by using variables for the size and efficiency of the banking sector. The analysis might benefit if we add certain variables to represent capital market development.

5.2 Suggestions for Future Studies

This study examines the relationship between FD and FDI by considering six variables. As mentioned in the section on limitations, certain suggestions can be made for future studies. Future studies could analyze the FD of both the banking sector and stock and capital markets for a longer period.

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Appendix

Countries List (93)

No.	country	iso3	Classification	No.	country	iso3	Classification
1	Angola	AGO	Upper Middle Income	48	Jordan	JOR	Upper Middle Income
2	Albania	ALB	Upper Middle Income	49	Japan	JPN	High Income
3	Argentina	ARG	Upper Middle Income	50	Kyrgyz Republic	KGZ	Lower Middle
4	Armenia	ARM	Lower Middle	51	Korea, Rep.	KOR	High Income
5	Australia	AUS	High Income	52	Kuwait	KWT	High Income
6	Austria	AUT	High Income	53	Sri Lanka	LKA	Lower Middle
7	Azerbaijan	AZE	Upper Middle Income	54	Latvia	LVA	High Income
8	Burundi	BDI	Low Income	55	Morocco	MAR	Lower Middle
9	Belgium	BEL	High Income	56	Mexico	MEX	Upper Middle Income
10	Benin	BEN	Low Income	57	Mali	MLI	Low Income
11	Burkina Faso	BFA	Low Income	58	Malta	MLT	High Income
12	Bangladesh	BGD	Lower Middle	59	Mongolia	MNG	Lower Middle
13	Bulgaria	BGR	Upper Middle Income	60	Mozambique	MOZ	Low Income
14	Bahrain	BHR	High Income	61	Malawi	MWI	Low Income
15	Belarus	BLR	Upper Middle Income	62	Malaysia	MYS	Upper Middle Income
16	Bolivia	BOL	Lower Middle	63	Namibia	NAM	Upper Middle Income
17	Brazil	BRA	Upper Middle Income	64	Niger	NER	Low Income
18	Botswana	BWA	Upper Middle Income	65	Nicaragua	NIC	Low Income
19	Switzerland	CHE	High Income	66	Netherlands	NLD	High Income
20	Chile	CHL	High Income	67	New Zealand	NZL	High Income
21	China	CHN	Upper Middle Income	68	Panama	PAN	Upper Middle Income
22	Colombia	COL	Upper Middle Income	69	Peru	PER	Upper Middle Income
23	Cyprus	CYP	High Income	70	Philippines	PHL	Lower Middle
24	Czech Republic	CZE	High Income	71	Poland	POL	High Income
25	Germany	DEU	High Income	72	Portugal	PRT	High Income
26	Denmark	DNK	High Income	73	Paraguay	PRY	Upper Middle Income
27	Dominican Republic	DOM	Upper Middle Income	74	Romania	ROU	Upper Middle Income
28	Egypt, Arab Rep.	EGY	Lower Middle	75	Russian Federation	RUS	Upper Middle Income
29	Finland	FIN	High Income	76	Senegal	SEN	Low Income
30	Fiji	FJI	Upper Middle Income	77	Singapore	SGP	High Income
31	France	FRA	High Income	78	Serbia	SRB	Upper Middle Income
32	United Kingdom	GBR	High Income	79	Suriname	SUR	Upper Middle Income
33	Georgia	GEO	Upper Middle Income	80	Slovenia	SVN	High Income
34	Guinea-Bissau	GNB	Low Income	81	Sweden	SWE	High Income
35	Greece	GRC	High Income	82	Swaziland	SWZ	Lower Middle
36	Guatemala	GTM	Lower Middle	83	Togo	TGO	Low Income
37	Hong Kong SAR, China	HKG	High Income	84	Thailand	THA	Upper Middle Income
38	Honduras	HND	Lower Middle	85	Tonga	TON	Lower Middle
39	Croatia	HRV	High Income	86	Trinidad and Tobago	TTO	High Income
40	Hungary	HUN	Lower Middle	87	Uganda	UGA	Low Income
41	Indonesia	IDN	Lower Middle	88	Ukraine	UKR	Lower Middle
42	India	IND	Lower Middle	89	Uruguay	URY	High Income
43	Ireland	IRL	High Income	90	United States	USA	High Income
44	Iceland	ISL	High Income	91	Venezuela, RB	VEN	Upper Middle Income
45	Israel	ISR	High Income	92	Vanuatu	VUT	Lower Middle
46	Italy	ITA	High Income	93	South Africa	ZAF	Upper Middle Income
47	Jamaica	JAM	Upper Middle Income				