

THE LONG-RUN EFFECT OF INWARD AND OUTWARD FOREIGN DIRECT INVESTMENT ON ECONOMIC GROWTH: EVIDENCE FROM DEVELOPING ECONOMIES

Waqar Ameer, Helian Xu

- (1) School of Economics and Trade, Hunan University, Yuelushan, Changsha, Hunan Province, People's Republic of China
- (2) School of Economics and Trade, Hunan University, Yuelushan, Changsha, Hunan Province, People's Republic of China
-

Waqar Ameer

School of Economics and Trade, Hunan University
Yuelushan, Changsha, Hunan Province, People's Republic of China
waqar.ameer@yahoo.com

Article info

Paper category: Original Scientific Paper

Received: 18.5.2017.

Accepted: 19.7.2017.

JEL classification: C23, F21, F23

ABSTRACT

In this paper, we investigate impact of inward and outward foreign direct investment on economic growth in developing economies over time period 2005-2014 annually. From 2005-2014, had inward and outward foreign direct investment had significant long-term effects on economic growth in developing countries. In this paper, we have used a different approach to examine the impact of FDI outflows and inflows on economic growth using Ordinary Least Squares (OLS) and Generalized Method of Moments (GMM) on the basis of macroeconomics panel data in developing economies over time span 2005-2014 annually. Our findings are as follows: (1) there is positive and significant impact of foreign direct investment outflows and inflows on economic growth in the long run among developing economies and (2) The positive and significant effects of FDI inflows and outflows on economic growth are highly robust by applying different econometric techniques (3) From our econometric results, we infer that control variables play significant role in defining exact relationship between inward FDI, outward FDI and economic growth. The control variables should be relevant and related with the econometric model to derive accurate relationship between inward FDI, outward FDI and economic growth.

Keywords:

Outward FDI; Inward FDI; GMM; Endogeneity; Panel data

1. INTRODUCTION

Foreign Direct investment (FDI) outflows from developing countries have grown faster in last thirty years than those from developed countries. According to United Nations Conference on Trade and Development (UNCTAD) data, the share of developing countries in total world FDI outflows increased more than thirty-fold from 0.5% in the early 1970s to about 16% in 2008. FDI outflows from developing countries reached approximately 300 billion US dollars in 2008, which is more than three times the value of world FDI outflows in 1970.¹ Developing countries' outward foreign direct investment flows have reached \$426 billion, a record 31 per cent of the world total outflows (UNCTAD, 2013).

The relationship between foreign direct investment and economic growth has been subject of large academic literature over last decades. Borensztein et al. (1998) analyze effect of FDI on economic growth based on following periods 1970-1979 and 1980-1989. They concluded that FDI effect economic growth positively and FDI and domestic investment are complementary. Bengoa and Sanchez-Robles (2003) conclude that FDI influenced economic growth positively only when these countries have sufficient human capital, liberalized markets and economic stability using panel data of 18 countries in Latin America. Soltani and Ochi (2012) found causal relationship between economic growth and FDI in Tunisia using data for time span 1975-2009 in Tunisia. They concluded that FDI causes economic growth significantly. De Mello (1997) concluded that effects of FDI on economic growth of the host country depends on the degree of efficiency of local firms. The long run growth effects depend on rate of time preference and on productivity of domestic capital and foreign capital as well as degree of complementary behavior between domestic and foreign capital.

Recent studies by Herzer (2008) for industrialized countries suggest significant and positive effect of FDI outflows on domestic output in the long-run. The effects of inward and outward FDI may differ between developed and developing countries. Firstly, Financial markets are under developed in many developing countries and many firms do not have access to foreign capital markets in developing countries, developing country multinational companies are generally more likely to face financial constraints than developed country multinationals. Secondly, FDI outflows can reduce domestic capital, and thus reduce domestic output, when outward investors have scarce domestic resources. Thirdly, Ability to absorb knowledge from abroad depends on absorptive capacity of investing firm, firms with low levels of technological capacity are likely to be unable to effectively access knowledge through FDI outflows (UNCTAD, 2006).

Anwar and Sun (2011) found that FDI and domestic capital have positive and significant effects on economic growth. Adams (2009) analyzed effects of FDI on

¹ The figures are based on data from the UNCTAD FDI database (<http://stats.unctad.org/FDI/ReportFolders/reportFolders.aspx>)

economic growth in Sub-Saharan Africa and found that FDI is positively and significantly correlated with economic growth. Azman-Saini et al. (2010) explored relationship between FDI and economic growth and concluded that FDI has no direct effects on output growth. Tang et al. (2008) found that there is uni-directional causality running from FDI to economic growth in China, while causal relationship between domestic capital and economic growth is bilateral. Here in this research study, we will analyze impact of inward and outward FDI on economic growth in developing economies. Best to our knowledge, no previous studies have tried to find the impact of FDI outflows and inflows on economic growth in developing economies. Thus, we have tried to bridge the gap in the previous research studies by exploring impact of FDI outflows and inflows on economic growth in developing countries. Therefore, we have found it interesting to find impact of FDI outflows and inflows on economic growth in developing economies by introducing interesting and new research findings in the existing research literature.

In this paper, we examine the impact of FDI outflows and inflows on economic growth using Ordinary Least Squares (OLS) and Generalized Method of Moments (GMM) on the basis of macroeconomics panel data in developing economies over time span 2005-2014 annually. Our findings are as follows: (1) there is positive and significant impact of foreign direct investment outflows and inflows on economic growth in the long run among developing economies and (2) The positive and significant effects of FDI inflows and outflows on economic growth are highly robust by applying different econometric techniques (3) Governance indicators show significant and negative effects on economic growth by applying different techniques as well as control variables show significant effects on economic growth in developing economies. (4) From our econometric results, we infer that control variables play significant role in defining exact relationship between inward FDI, outward FDI and economic growth. The control variables should be relevant and related with the econometric model to derive accurate relationship between inward FDI, outward FDI and economic growth.

The paper is organized as follows: Section 2. describes Data and Sample Selection; Section 3. explains Econometric model; Section 4. Estimation Method; Section 5. Empirical Results and Section 6. Conclusion

2. DATA AND SAMPLE SELECTION

In this study, we have used net OFDI (% GDP), IFDI (% GDP), Gross capital formation (% GDP), Gross domestic savings (% of GDP), trade (% GDP), Inflation; GDP deflator (annual %), GDPC (annual %), Labor force; total, Governance and GDP deflator (base year varies by country). IFDI, OFDI and GDP are measured in current US dollars. GDP Growth (GDP) is used proxy for economic growth. Inflation, GDP Deflator (annual %) is used proxy for inflation to measure macroeconomic in-

stability. DI is the domestic investment of country i in year t ; $IFDI$ is foreign direct investment inflows of the country i in year t ; $OFDI$ is outward foreign direct investment of the country i in year t ; and ϵ_{it} is the error term. The starting period of this data set is determined by the earliest available data. We have used net $OFDI$ rather than the gross $OFDI$ because the gross inward and outward FDI figures reflect the sum of the absolute outflow and inflow values in the balance of payment financial accounts and thus do not take into account disinvestment. Because the net inflows and outflows have negative values in some years, it is not possible to use logarithms. Thus, it is common practice in research to use net FDI as a percentage of the GDP to derive economically interpretable results. Data on the net FDI outflows as a percentage of the GDP is taken from the UNCTAD FDI database. GDP , trade (% GDP), $GDPG$ (% annual), gross capital formation (% GDP), Labor force; total, Inflation, GDP deflator (annual %), Governance and the GDP deflator are taken from World Bank, World Development Indicators and World Governance Indicators Database.

Table 1.: Summary Statistics (2005-2014)

Variables	No. of observations	Mean	Standard Deviation	Minimum	Maximum
GDP	800	5.018	4.162	-14.8	34.5
Lag of GDP	720	5.151	4.282	-14.8	34.5
$IFDI$	800	5.058	5.419	-5.977	45.273
$OFDI$	800	.8809	2.543	-4.655	33.667
GOV	800	0	1	-2.385	2.844
$INFLATION$	800	7.241	8.625	-27.632	103.82
$TRADE$	800	84.324	32.416	22.105	203.85
Domestic Investment	800	24.537	8.202	3.553	65.72

Source: authors' results

Note: The variables are Lagged GDP (Previous year GDP Growth), $IFDI$ (Inward FDI), $OFDI$ (Outward FDI), Trade, Inflation, GOV (Governance), Trade Openness (Trade), GDP (GDP Growth), and Domestic Investment

This study uses a governance dataset compiled by Worldwide Governance Indicators (WGI) over time span 2005-2014 annually for six dimensions of governance, i.e., Control of corruption, Government Effectiveness index, Political Stability and Absence of Violence, Regulatory Quality index, Rule of Law, and Voice and Accountability (Kaufmann, Kraay, and Mastruzzi, 2007). The Control of Corruption index captures perceptions of corruption including both petty and grand forms of corruption. The Government Effectiveness index captures the quality of bureaucracy, the competency of civil servants and government's commitment to policies. Political stability and absence of violence measures perceptions of likelihood of social unrest, terrorism, violent demonstrations, and security risk rating, etc. The Regulatory

Quality index measures price controls, inadequate bank supervision and perceptions of burdens imposed by excessive regulations such as foreign trade, business development etc. The rule of law index captures enforceability of contracts and the effectiveness of judiciary. Voice and Accountability captures different aspects of political process, civil liberties and independence of the media.

Table 2.: Correlation matrix: Governance indicators

	Control of Corruption	Government Effectiveness	Political Stability	Regulatory Quality	Rule of Law	Voice and Accountability
Control of Corruption	1.0000					
Government Effectiveness	0.8532	1.0000				
Political Stability	0.6293	0.5339	1.0000			
Regulatory Quality	0.7973	0.8921	0.5182	1.0000		
Rule of Law	0.9058	0.8900	0.6402	0.8319	1.0000	
Voice and Accountability	0.7227	0.6283	0.4924	0.6851	0.6679	1.0000

Source: Authors' results

The correlation matrix for governance indicators are displayed in Table 2. Globerman and Shapiro (2002) have illustrated that these indices are highly correlated with each other; therefore, it is very difficult to use all in single regression model. From an econometric point of view, the high correlation between the variables can cause multicollinearity and might reduce the extent to which the relevance of each individual governance indicator can be measured. Daude & Stein (2007) note that the standard solution is to group the variables into one aggregate component that measures similar dimensions. As a result, we follow Globerman and Shapiro (2002) by extracting the first principal component of six governance indicators by employing factor analysis. As displayed in Table 1, the governance indicator is used in our econometric model ranges from -2.38547 to 2.84429. The observed mean value of 0 and standard deviation is 1.0 is very similar with Globerman and Shapiro (2002) estimates. All independent variables are drawn from the World Development Indicators (WDI) and World Governance Indicators (WGI) database. The countries included are Afghanistan, Albania, Angola, Armenia, Azerbaijan, Bahamas, The, Bangladesh, Belarus, Belize, Benin, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Chile, China, Colombia, Congo, Rep., Costa Rica, Cote d'Ivoire, Dominican Republic, Egypt, Arab Rep., El Salvador, Ga-

bon, Georgia, Ghana, Guatemala, Guinea, Guinea-Bissau, Honduras, India, Indonesia, Iraq, Jamaica, Jordan, Kazakhstan, Kenya, Kyrgyz Republic, Lao PDR, Lebanon, Macao SAR, China, Macedonia, FYR, Malawi, Malaysia, Mali, Mauritius, Mexico, Moldova, Mongolia, Morocco, Mozambique, Namibia, Nicaragua, Niger, Nigeria, Pakistan, Panama, Paraguay, Peru, Philippines, Romania, Russian Federation, Senegal, South Africa, Sri Lanka, St. Lucia, Thailand, Timor-Leste, Togo, Trinidad and Tobago, Tunisia, Uganda, Ukraine, Uruguay, Vietnam. Some of the developing countries that are not included because of missing and non-availability of data.

3. ECONOMETRIC MODEL

In this section, we construct the econometric model and explain it in detail. Following previous studies and economic intuition, we formulate an econometric model where we assume that level of economic growth depends upon the level of economic growth in the previous years, on outward FDI, inward FDI and a list of control variables that captures economic conditions in developing economies. i_t is a vector of control variables. We have added this list of control variables, namely, Governance (GOV), Domestic investment (DI), Inflation and Trade. We consider Governance (GOV) very important control variable, given that pivotal and significant role of governance at the macroeconomic level. Thus, we consider Governance as very important factor of economic growth.

$$\mathbf{GDP}_{it} = \alpha_0 + \alpha_1 \text{Lagged GDP}_{it-1} + \alpha_2 \text{IFDI}_{it} + \alpha_3 \text{OFDI}_{it} + \alpha_4 \text{GOV}_{it} + \alpha_5 X'_{it} \beta + \varepsilon_{1it} \quad (1)$$

$$\varepsilon_{it} = \eta_i + v_{it} \dots \quad (2)$$

where $i = 1, 2, 3, \dots, N$; $t = 1, 2, 3, \dots, T$, i is the home country, t is the time, α and β are unknown parameters to be estimated, η is the unobserved country-specific effects, and ε is the random disturbance term. The primary interest of our analysis is the sign and magnitude of the estimated coefficient of FDI inflows (IFDI) and outward FDI (OFDI). The control variables are selected based on existing research literature. The past values of economic growth are expected to have positive effects on current economic growth because it may be a sign of good and healthy investment environment. Each country's economic stability plays significant role in economic development. Macroeconomic instability is measured by inflation rate and is generally considered to have a negative association (Greene and Vilanueva, 1991; Serven and Solimano, 1993; Oshikoya, 1994; Ndikumana, 2000).

The relationship between economic growth and outward foreign domestic investment as well as economic growth and foreign direct investment inflows, has been subject of large academic research over the past few decades. Nguyen and Nguyen (2010) have identified bi-directional relationship between FDI and economic growth in which FDI promotes economic growth and, in turn, economic growth is regarded as tool to attract

FDI. Tsai (1994) applied a simultaneous equation system to examine bi-directional relationship between FDI and economic growth for 62 countries between 1975-1978 and 51 countries for period 1983-1986. His work supports that two-way relationship exists between FDI and economic growth. Anwar and Nguyen (2010) study bi-directional relationship between economic growth and FDI in 61 provinces of Vietnam over time span 1996-2005. They support view that two-way relationship between FDI and economic growth exists in Vietnam and explored relationship between FDI and economic growth across seven regions of Vietnam. The empirical results suggest that bi-directional relationship exist between FDI and economic growth only in four regions.

Anwar and Sun (2011) have also shown that foreign direct investment and domestic capital have positive significant impact on economic growth. Adams (2009) analyzed that impact of FDI on economic growth in Sub-Saharan Africa and found that FDI and economic growth are positively and significantly correlated with each other. Azman-Saini et al. (2010) found linkage between FDI and economic growth and proved that FDI by itself has no positive direct effect on output growth. On the contrary, Tang et al. (2008) found that there is one-way causality from FDI to economic growth in China, while relationship between domestic investment and economic growth is bilateral.

4. ESTIMATION METHOD

We use the System-Generalized Method of Moments (GMM) one-step and two-step estimator developed by Arellano and Bover (1995) and Blundell and Bond (1988) for our estimates. The Arellano-Bover/Blundell-Bond estimator is referred to as A-B-B estimator. GMM is generally used to study dynamics of adjustment using samples with relatively large cross-sections and short time periods. In order to measure the effects of FDI inflows and FDI outflows on economic growth in the home country, this research study uses the system-GMM estimator developed by Arellano and Bover (1995) and Blundell and Bond (1998), which yield consistent and efficient estimates by addressing two key econometric issues.

Considering equation (1): this includes one of the explanatory variables of the lagged level of economic growth. Firstly, the presence of a lagged dependent variable would yield biased estimates because ordinary least square estimates (OLS) leads to auto-correlation because of the correlation between error terms and lagged dependent variable (i.e., explanatory variable). Using ordinary least squares (OLS) would make estimations inconsistent and bias the coefficient of lagged terms upwards, while using the fixed-effects would cause a downward bias in estimated results. The system-GMM estimator controls for unobserved country-specific factors and the estimated coefficients would not be biased from an omitted variable. Secondly, FDI inflows and FDI outflows are endogenous and jointly determined with economic growth. Thus, there is a two-way causality running between economic growth and FDI inflows as well as economic growth and outward FDI. It is very difficult to find appropriate instrument for inward FDI and

outward FDI and thus system GMM estimator resolves the endogeneity issue by using instruments based on lagged values of dependent and independent variables.

To resolve these issues, Arellano and Bond (A-B) (1991) recommend a first difference A-B GMM estimator. One advantage of this is that endogenous regressors and the lagged dependent variable can be instrumented using its lagged levels. The other advantage is that it also removes fixed country-specific effects by taking first differences of Equation (1), thus removing individual specific effects, as reported below in Equation (3).
$$GDP_{i,t} - GDP_{i,t-1} = \alpha_1(GDP_{i,t-1} - GDP_{i,t-2}) + \alpha_2(IFDI_{i,t} - IFDI_{i,t-1}) + \alpha_3(OFDI_{i,t} - OFDI_{i,t-1}) + \alpha_4(GOV_{i,t} - GOV_{i,t-1}) + \beta^2(X_{i,t} - X_{i,t-1})(v_{i,t} - v_{i,t-1}) + \varepsilon_{i,t} \dots \quad (3)$$

Blundell and Bond (1998) point out that the first-differenced GMM estimator developed by Arellano and Bond (1991) has poor finite sample bias and poor precision when lagged levels of series are weak instruments for the first differences, specifically for variables that are close to a random walk. The system-GMM model overcomes this problem by combining in one system the regression in differences with the regression in levels under the assumption. In Equation (3), given assumption of no autocorrelation between error terms and regressors or regressors and error terms, the minimum lag level of dependent variables must be two or greater.

A key limitation of the first difference GMM estimator is that it does not necessarily remove first order serial correlation in the residuals because instruments used to control endogeneity are weakly exogenous in the regression. Thus, in our study, we use one step and two-step system-GMM to control for weak instrument problems by using a level equation to obtain a system of two equations. The first equation includes instruments in first differences, while the second equation includes instruments in levels. By inclusion of the second equation, the variables in the first differences are instruments for variables in levels, which make estimates more efficient and consistent. The use of two-step GMM makes standard covariance matrix robust to panel-specific autocorrelation and heteroscedasticity. For testing the validity of the one step and two-step system-GMM model, the system-GMM estimator checks for validity of instruments using the Sargan/Hansen test for over-identifying restrictions. The second-order serial correlation of the differenced error term is also tested for the null hypothesis that there is no serial correlation.

5. EMPIRICAL RESULTS

5.1. OLS Results

Some studies employ cross-sectional regressions to test the relationship between FDI inflows, FDI outflows and economic growth. This study starts with cross-sectional analysis in order to test relationship between FDI inflows, FDI outflows and economic growth over time span 2005 to 2014 annually. The OLS cross-sectional results are reported in Table 3.

Table 3.: OLS results

Dependent Variable : Domestic Investment/GDP: 2005-2014 (OLS)							
Independent variables	1	2	3	4	5	6	7
Lag of GDP	.3555***	.3584***	.3597***	.3664***	.3574***	.3606***	.3597***
	7.17	7.33	7.28	7.48	7.17	7.36	7.34
IFDI	.0643**	.0634**	.0565*	.0638**	.0646**	.0604*	.0663**
	1.95	1.94	1.70	1.94	1.96	1.84	2.00
OFDI	.1984*	.1919*	.2061*	.1795	.2047*	.1990*	.1758
	1.69	1.66	1.69	1.60	1.70	1.69	1.54
GOV	-.4794***						
	-2.65						
Control of corruption		-.6856***					
		-2.82					
Government effectiveness			-.6922**				
			-2.20				
Political stability				-.4431**			
				-2.12			
Regulatory quality					-.7973***		
					-2.48		
Rule of law						-.6665***	
						-2.36	
Voice and accountability							-.4886***
							-2.47
INFLATION	.0342***	.0363***	.0351***	.03818***	.0330**	.0364***	.0369***
	2.34	2.54	2.40	2.61	2.25	2.49	2.51
TRADE	-.0033	-.0038	-.0032	-.0018	-.0040	-.0039	-.0052
	-0.75	-0.85	-0.72	-0.38	-0.89	-0.86	-1.13
Domestic Investment	.0747***	.0720***	.0745***	.0727***	.0723***	.0762***	.0666***
	3.51	3.50	3.40	3.56	3.40	3.53	3.27
Constant	.7811	.5426	.5465	.4427	.7251	.4555	.9687***
	1.52	1.04	0.97	0.81	1.38	0.81	1.90
No of Observations	720	720	720	720	720	720	720
R-squared	0.78	0.77	0.7750	0.7767	0.78	0.77	0.7750
VIF	2.40	2.39	2.41	2.31	2.41	2.42	2.26

Source: Authors' results

Note: System-GMM is applied for estimation. The t-statistics are in brackets. ** and *** indicate 10%, 5%, and 1% level of significance respectively. ar1 and ar2 are tests for first and second order serial correlation, respectively. The variables are Lagged GDP (Previous year GDP Growth), IFDI (Inward FDI), OFDI (Outward FDI), Trade, Inflation, GOV(Governance), Trade Openness (Trade), GDP (GDP Growth), and Domestic Investment.

Table 3. OLS cross-sectional results show that estimated coefficient of outward FDI is positive and significant at 10 % level of significance across columns (1) - (7). OLS results show that estimated coefficient of FDI inflows have also positive and significant at 5 % and 10 % level of significance. The positive and significant effects of FDI inflows and outflows on economic growth remain unchanged using aggregate governance and individual governance indicators along with other control variables, as reported in Table 3 in models 1-7. The results show that lagged value of GDP (Previous year of economic growth) has strongly positive and significant effects on current GDP (current year of economic growth). Across models 1-7 in Table 3, our general findings show that economic growth in previous years have consistently highly positive and significant effects on current economic growth, particularly at the 1 %, 5 % and 10 % level of significance, and a 1% increase in economic growth in previous years increases current economic growth in range of 35.55% - 36.64%. As results reported in Table 3, a one percent increase in the lagged dependent variable (economic growth in previous years) leads to an increase in current economic growth by 35.55% in model 1, 35.84% in model 2, 35.97% in model 3, 36.64% in model 4, 35.74% in model 5, 36.06% in model 6, and 35.97% in model 7. The other control variables, i.e. (domestic investment and inflation) have positive and highly significant effects on economic growth but trade have insignificant effects on economic growth. It implies from statistical results that increase in domestic investment stimulates economic growth as well as inflation motives economic growth positively. Indeed, the cross-sectional regression results show that there is a strong positive relationship between FDI inflows and its economic growth as well as outward FDI and economic growth are strongly positively associated. Yet, cross-sectional analysis ignores time-series fluctuations and only tests the relationship between outward FDI, inward FDI and economic growth in the long run. Such econometric methodology cannot capture or control for unobserved country-specific effects that can vary across countries and may be correlated with inward FDI and outward FDI.

5.2. GMM-One Step

Table 4. contains the principal empirical result findings and reports results for one step System GMM in columns (1) - (7). Across columns (1) - (7) in Table 4, our general result findings are that, in all cases, FDI inflows has consistently positive and significant effects on economic growth particularly at 5 % and 10 % level of significance, a 1% increase in FDI inflows increases economic growth in range of 18.54 % - 22.36% in models (1) - (7). Our general result findings are that, in all cases, FDI outflows have consistently positive and significant effects on economic growth particularly at 5% and 10 % level of significance, a 1% increase in FDI outflows increases economic growth in range of 73.25% - 76.70% across

columns (1) - (7) in Table 4. Our result findings show across models (1) - (7) in Table 4, in all cases, Governance have significant and negative effects on economic growth. Our result findings show that Governance is negatively associated with economic growth. Perhaps this negative relationship between Governance and economic growth may be due to weak and poor governance indicators, i.e. weak control of corruption; government ineffectiveness; poor law and order; Political instability etc. Governance indicators should be strong enough to offset negative effects on economic growth in the long run and have positive and significant effects on economic growth as a result stimulate economic growth. Strong Governance indicators can result in increased FDI inflows and outflows and stimulate economic growth.

Table 4.: GMM-One Step

Dependent Variable : Domestic Investment/GDP: 2005-2014 (one step System- GMM)							
Independent variables	1	2	3	4	5	6	7
Lag of GDP	.1495** 2.30	.1455** 2.26	.1711*** 2.64	.1404** 2.25	.1500** 2.29	.1526** 2.37	.1431*** 2.31
IFDI	.2164** 2.10	.2170** 2.15	.1854* 1.75	.2236** 2.11	.1937** 1.91	.2017** 1.97	.2140** 2.16
OFDI	.7388*** 5.09	.7503*** 5.04	.7325*** 4.90	.7670*** 4.95	.7573*** 4.95	.7567*** 4.99	.7446*** 5.25
GOV	-.8027*** -2.51						
Control of corruption		-1.148*** -2.44					
Government effectiveness			-1.0879** -1.91				
Political stability				-.7024** -2.11			
Regulatory quality					-1.307*** -2.48		
Rule of law						-1.232*** -2.52	
Voice and accountability							-.7576** -1.92
INFLATION	.0454*** 2.99	.0465*** 3.14	.0487*** 3.12	.0482*** 3.05	.0469*** 2.97	.0471*** 3.07	.0483*** 3.15
TRADE	-.0138** -2.24	-.0150** -2.36	-.0130** -2.17	-.0127* -1.73	-.0140** -2.32	-.0143** -2.30	-.0173*** -2.59
Domestic Investment	.0984** 2.30	.0959** 2.35	.1004** 2.21	.0979** 2.37	.1013** 2.38	.1048*** 2.39	.0911** 2.35
Constant	.7953 0.88	.4155 0.43	.3422 0.33	.3748 0.35	.5648 0.63	.1394 0.13	1.0792 1.20
No of Observations	720	720	720	720	720	720	720

Dependent Variable : Domestic Investment/GDP: 2005-2014 (one step System- GMM)							
ar1(p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ar2(p-value)	0.209	0.210	0.237	0.198	0.199	0.207	0.204
Sargan tests(p-value)	0.145	0.136	0.145	0.154	0.103	0.143	0.174
Difference in Hansen(p-value)	0.913	0.896	0.938	0.925	0.858	0.921	0.949

Source: Authors' results

Note: System-GMM is applied for estimation. The t-statistics are in brackets*, ** and *** indicate 10%, 5%, and 1% level of significance respectively. ar1 and ar2 are tests for first and second order serial correlation, respectively. The variables are Lagged GDP (Previous year GDP Growth), IFDI (Inward FDI), OFDI (Outward FDI), Trade, Inflation, GOV(Governance), Trade Openness (Trade), GDP (GDP Growth), and Domestic Investment.

As results reported in Table 4., the estimated results for FDI inflows is statistically significant and positive at the 1% level of significance, which complies with prior research studies. The estimated coefficients are stable and robust with different model specifications. From our findings, in all cases, FDI inflows have consistently significant and positive impacts on economic growth at the 1% level of significance. Regarding IFDI in Table 4, a one percent increase in FDI inflows lead to increase in economic growth by 21.64% in model 1, 21.70% in model 2, 18.54% in model 3, 22.36% in model 4, 19.37% in model 5, 20.17% in model 6, and 21.40% in model 7. From our findings, in all cases, FDI outflows have consistently significant and positive impacts on economic growth at the 1% level of significance. Regarding OFDI in Table 4, a one percent increase in FDI inflows lead to increase in economic growth by 73.88% in model 1, 75.03% in model 2, 73.25% in model 3, 76.70% in model 4, 75.73% in model 5, 75.67% in model 6, and 74.46% in model 7. The positive and significant effects of outward and inward FDI on economic growth still remain unchanged using the aggregate governance variable and individual governance indicators along with other control variables, as displayed in Table 4. in models 1-7.

5.3. GMM-Two Step

As results reported in Table 5., the estimated results for outward FDI is statistically significant and positive at 5% and 10% level of significance. The estimated coefficients are stable and robust with different model specifications. From our findings, in all models, outward FDI has significant and positive effects on economic growth at the 10% level of significance. Regarding OFDI in Table 5, a one percent increase in outward FDI increases economic growth by 75.14% in model 1, 75.94% in model 2, 74.75% in model 3, 77.30% in model 4, 76.89% in model 5, 77.06% in model 6 and 74.87% in model 7. The significance of positive relationship between outward FDI and economic growth remains unchanged, even after using aggregate and individual governance indicators along with independent and control variables in Table 5. in models 1-7.

Regarding IFDI in Table 5., a one percent increase in FDI inflows increases economic growth by 20.48 % in model 1, 20.48% in model 2, 16.62% in model 3, 21.92% in model 4, 17.82% in model 5, 18.62% in model 6 and 21.33% in model 7. The positive and significant effects of FDI inflows and outflows on economic growth still remain unchanged using the aggregate governance variable and individual governance indicators along with other control variables, as displayed in Table 5 in models (1) -(7).

Now, we discuss other two very important variables in our model: economic growth and governance. Economic growth in previous years (lagged dependent variable) have positive and significant effects on current economic growth in all models. The result findings displayed in Table 5. show that previous year economic growth robustly enhances the current economic growth rate. Across models 1-7 in Table 5, our general findings show that economic growth in previous years have consistently highly positive and significant effects on current economic growth, particularly at the 1% level of significance, and a 1% increase in economic growth in previous years increases current economic growth in range of 13.27% - 15.96%. As results reported in Table 5, a one percent increase in the lagged dependent variable (economic growth in previous years) leads to an increase in current economic growth by 13.91% in model 1, 13.27% in model 2, 15.96% in model 3, 13.43% in model 4, 14.18% in model 5, 14.16% in model 6, and 14.02% in model 7 in Table 5, we report results of seven econometric models, referred to as models 1-7, respectively. Based on equation (3), our core model specification comprises of the previous year's economic growth, IFDI, OFDI, and Governance. In order to control for endogeneity between economic growth, IFDI and OFDI, we include control variables in our econometric model. We include set of control variables, namely, Governance, inflation, trade and domestic investment, given their strong influence found in previous research studies. Domestic investment has positive and significant effects on current economic growth across all models (1) -(7) at 1 % level of significance. Inflation and Trade have also positive and significant effects on current economic growth across all models (1) -(7) at 5% and 10% level of significance. Our statistical results show that increase in domestic investment stimulates economic growth as well as Inflation and Trade have positive effects on economic growth.

Table 5.: GMM-Two Step

Dependent Variable : Domestic Investment/GDP: 2005-2014 (two step System- GMM)							
Independent variables	1	2	3	4	5	6	7
Lag of GDP	.1391** (2.06)	.1327** 1.95	.1596** 2.37	.1343** 2.06	.14181** 2.07	.1416** 2.10	.14021** 2.19
IFDI	.2048* 1.82	.2048* 1.81	.1662 0.161	.2192** 1.93	.1782 1.47	.1862* 1.75	.2133** 1.97
OFDI	.7514*** 5.33	.7594*** 5.21	.7475*** 5.13	.7730*** 5.14	.7689*** 5.14	.7706*** 5.25	.7487*** 5.47
GOV	-.7960*** -2.80						
Control of corruption		-1.2466*** -2.70					
Government effectiveness			-1.1133** -2.14				
Political stability				-4.974 0.159			
Regulatory quality					-1.3664*** -2.69		
Rule of law						-1.1260*** -2.59	
Voice and accountability							-7.453** -2.10
INFLATION	.0437*** 2.45	.0459534*** 2.60	.0477*** 2.49	.0444*** 2.45	.0442** 2.28	.0451656*** 2.56	.0454*** 2.58
TRADE	-.0110391 -1.62	-.0123091* -1.71	-.0092 -1.25	-.01230 -1.46	-.0112 -1.51	-.0115* -1.68	-.0153** -2.08
Domestic Investment	.09496** 2.25	.0914** 2.29	.0972** 2.36	.0879** 2.21	.0996** 2.35	.1011** 2.34	.0854** 2.35
Constant	.9024839 0.91	.5392 0.50	.3988 0.37	.9041 0.82	.5743 0.54	.3285 0.30	1.2359 1.42
No of Observations	720	720	720	720	720	720	720
ar1(p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000
ar2(p-value)	0.280	0.268	0.305	0.269	0.278	0.277	0.285
Sargan tests(p-value)	0.145	0.136	0.145	0.154	0.103	0.143	0.174
Difference in Hansen(p-value)	0.913	0.896	0.938	0.925	0.858	0.921	0.949

Source: authors' results

Note: System-GMM is applied for estimation. The t-statistics are in brackets, **, * and *** indicate 10%, 5%, and 1% level of significance respectively. ar1 and ar2 are tests for first and second order serial correlation, respectively. The variables are Lagged GDP (Previous year GDP Growth), IFDI (Inward FDI), OFDI (Outward FDI), Trade, Inflation, GOV(Governance), Trade Openness (Trade), GDP (GDP Growth), and Domestic Investment.

The Sargan test and serial correlation test results are displayed in Table 5. Across all seven models, the Sargan tests suggest that the null hypothesis of validity of instruments cannot be rejected. The serial correlation test results suggest that there are first-order serial correlations, which are usually expected, but there is no evidence of second-order serial correlation in the differenced error terms. We also report differences in Hansen tests to confirm validity of each subset of instruments in Table 5. Again, the Hansen tests do not reject the null hypothesis of the joint validity of all the instruments.

6. CONCLUSION

This paper has analyzed long run effects of inward and outward FDI on economic growth in developing economies over time span 2005-2014 annually. In this paper, we have used a different approach to examine the impact of FDI outflows and inflows on economic growth using Ordinary Least Squares (OLS) and Generalized Method of Moments (GMM) on the basis of macroeconomics panel data in developing economies over time span 2005-2014 annually. The result findings are robust by using different econometric techniques. Our findings are as follows: (1) there is positive and significant impact of inward and outward FDI on economic growth in the long run among developing economies and (2) The positive and significant effects of FDI inflows and outflows on economic growth are highly robust by applying different econometric techniques (3) Governance indicators show significant and negative effects on economic growth by applying different techniques as well as control variables show significant effects on economic growth in developing economies.(4) From our econometric results, we infer that control variables play significant role in defining exact relationship between inward FDI, outward FDI and economic growth. The control variables should be relevant and related with the econometric model to derive accurate relationship between inward FDI, outward FDI and economic growth.

Perhaps this negative relationship between Governance and economic growth may be due to weak and poor governance indicators, i.e. weak control of corruption; government ineffectiveness; poor law and order; Political instability etc. Governance indicators should be strong enough to offset negative effects on economic growth in the long run and have positive and significant effects on economic growth as a result stimulate economic growth. Strong Governance indicators can result in increased FDI inflows and outflows and stimulate economic growth. In sum, our result findings support that inward and outward FDI have positive and significant impact on economic growth in developing economies in long run. In developing economies where inward outward FDI are very high in last two decades, it is expected that FDI inward and outward FDI have significant and positive effects on economic growth in the long run. Outward and inward FDI

have increased rapidly in developing countries in last decade which strongly support our result findings. Our results strongly agree with Herzer (2011) result findings that FDI outflows have positive and significant impact on domestic output in developing economies in the long run.

REFERENCES

- Adams, S., Foreign direct investment, domestic investment, and economic growth in Sub-Saharan Africa. *J. Policy Model.* 31, (2009): 939-949
- Anwar, S., Nguyen, L.P., Foreign direct investment and economic growth in Vietnam. *Asia Pac. Bus. Rev.* 16, (2010): 83-202
- Anwar, S., Sun, S., Financial development, foreign investment and economic growth in Malaysia. *J. Asian Econ.* 22, (2011): 335-342
- Azman-Saini, W.N., Zubaidi Baharumshah, A., Law, S.H., Foreign direct investment, economic freedom and economic growth: international evidence. *Econ. Model.* 27, (2010): 1079-1089
- Baltagi, B.H., *Econometric analysis of panel data.* 3rd ed., John Wiley & Sons Ltd, England.
- Bengoa, M., Sanchez-Robles, B., 2003. FDI, economic freedom, and growth: new evidence from Latin America. *Eur. J. Polit. Econ.* 19, (2005): 529-545
- Blackburne, E. F., & Frank, M. W., Estimation of nonstationary heterogeneous panels. *Stata Journal*, 7(2), (2007): 197
- Borensztein, J., De Gregorio, J., Lee, J.W., How does foreign direct investment affect economic growth? *J. Int. Econ.* 45, (1998): 115-135
- Navaretti, G. B., & Castellani, D. 2004. Does investing abroad affect performance at home? Comparing Italian multinational and national enterprises. In CEPR Working Paper.
- Chakraborty, C., & Basu, P., Foreign direct investment and growth in India: A cointegration approach. *Applied economics*, 34(9), (2002): 1061-1073
- De Mello, L.R., Foreign direct investment in developing countries and growth: a selective survey. *J. Dev. Stud.* 34, (1997): 1-34
- Desai, M. C., Foley, C. F., & Hines Jr, J. R. 2005. Foreign direct investment and the domestic capital stock (No. w11075). National Bureau of Economic Research.
- Feldstein, M. S. (1995). The effects of outbound foreign direct investment on the domestic capital stock. In *The effects of taxation on multinational corporations* (pp. 43-66). University of Chicago Press.
- Herzer, D., The long-run relationship between outward FDI and domestic output: evidence from panel data. *Economics Letters*, 100(1), (2008): 146-149
- Herzer, D., & Schrooten, M., Outward FDI and domestic investment in two industrialized countries. *Economics letters*, 99(1), (2008): 139-143
- Herzer, D., The long-run effect of outward FDI on domestic output in developing countries. *Applied Economics Letters*, 18(14), (2011): 1355-1358
- Hansen, H., & Rand, J., On the causal links between FDI and growth in developing countries. *The World Economy*, 29(1), (2006): 21-41
- Im, K. S., Pesaran, M. H., & Shin, Y., Testing for unit roots in heterogeneous panels. *Journal of econometrics*, 115(1), (2003): 53-74
- Lee, C. G., Outward foreign direct investment and economic growth: Evidence from Japan. *Global Economic Review*, 39(3), (2010): 317-326

- Levin, A., Lin, C. F., & Chu, C. S. J., Unit root tests in panel data: asymptotic and finite-sample properties. *Journal of econometrics*, 108(1), (2002): 1-24
- Lim, M. E. G. 2001. Determinants of, and the relation between, foreign direct investment and growth: a summary of the recent literature (No. 1-175). International Monetary Fund.
- Liu, X., Burridge, P., & Sinclair, P. J., Relationships between economic growth, foreign direct investment and trade: evidence from China. *Applied economics*, 34(11), (2002):1433-1440
- Narayan, P. K., The relationship between saving and investment for Japan. *Japan and the World Economy*, 17(3), (2005): 293-309
- Nguyen, A.N., Nguyen, T., 2007. Foreign direct investment in Vietnam: an overview and analysis of the determination of spatial distribution. Working Paper, Development and Policies Research Center, Hanoi, Vietnam.
- Pesaran, M. H., The role of economic theory in modelling the long run. *The Economic Journal*, (1997): 178-191
- Pesaran, M. H., & Shin, Y., An autoregressive distributed-lag modelling approach to cointegration analysis. *Econometric Society Monographs*, 31, (1998): 371-413
- Pesaran, M. H., Shin, Y., & Smith, R. J., Bounds testing approaches to the analysis of level relationships. *Journal of applied econometrics*, 16(3), (2001): 289-326
- Ram, R., Additional evidence on causality between government revenue and government expenditure. *Southern Economic Journal*, (1988): 763-769
- Silverstovs, B., & Herzer, D., Export-led growth hypothesis: evidence for Chile. *Applied Economics Letters*, 13(5), (2006): 319-324
- Soltani, H., Ochi, A., Foreign direct investment (FDI) and economic growth: an approach in terms of cointegration for the case of Tunisia. *J. Appl. Finance Bank*, 2, (2012): 193-207
- Stevens, G. V., & Lipsey, R. E., Interactions between domestic and foreign investment. *Journal of international money and finance*, 11(1), (1992): 40-62
- Tang, S., Selvanathan, E., Selvanathan, S., Foreign direct investment, domestic investment and economic growth in China: a time series analysis. *World Econ*, 31, (2008): 1292-1309
- Tsai, P.L., Determinants of foreign direct investment and its impact on economic growth. *J. Econ. Dev.* 19, (1994): 137-163
- Zhang, K. H., Does foreign direct investment promote economic growth? Evidence from East Asia and Latin America. *Contemporary economic policy*, 19(2), (2001): 175-185
- UNCTAD. 2006. *World Investment Report 2006. FDI from developing and transition economies: Implications for development*. United Nations, New York.
- UNCTAD. 2008. *World Investment Report 2008. Transnational corporations and the infrastructure challenge*. United Nations, New York.
- UNCTAD. 2013. *World Investment Report 2013 - Global value chains: investment and trade for development*. United Nations, New York.

