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Inward FDI, Outward FDI and Domestic Investment: Evidence from Asian Economies Using Panel Data Analysis

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Abstract:
This study measures effects of FDI inflows and outflows on domestic investment in Asian economies using panel data analysis. Our estimates using system-Generalized Method of Moments (GMM) suggest that FDI inflows (IFDI) have positive and significant effects on domestic investment but outward FDI (OFDI) is negatively associated with domestic investment. From 2004-2014, OFDI and IFDI had significant long-term effects on domestic investment among the Asian economies. Our system Generalized Method of Moments (GMM) model results show that one dollar increase in FDI inflows leads to increase domestic investment by 0.3081 dollars. Our system Generalized Method of Moments (GMM) model results show that one dollar increase in FDI outflows leads to decrease domestic investment by 0.2704 dollars. Our result findings are robust with different econometric techniques measuring effects of inward FDI and outward FDI on domestic investment among Asian economies.
Keywords: FDI inflows; FDI outflows; Domestic investment; Endogeneity; Panel Data
JEL Classification numbers: C23; F21; F22; F23

1. Introduction

The impact of FDI outflows on domestic investment is a controversial issue that is still inconclusive. Some fraction of research studies conclude that outward FDI reduces domestic investment, while some of studies find that FDI outflows are positively associated with domestic investment, and yet still others find neutral effect. There is ongoing discussion on whether or not outward foreign direct investment reduces domestic investment. The macroeconomic relationship between OFDI and domestic investment is hardly researched. Feldstein (1994) and Desai et al (2005), using aggregate cross country data, conclude that outward FDI reduces domestic investment. The serious issue that arises with cross-country studies is that they assume analogous economic conditions and structures across countries. However, economic policies, technology and institutions vary across countries. Therefore, these studies may suffer from endogeneity problems.

The trend of causality between OFDI and domestic investment can be mixed or may differ from one country to another if countries are studied individually using time series data analysis because economics structure differ in each country. Therefore, the nature of the relationship between variables can be country-specific, which may depend on economic structure and macroeconomic environment. This is very clear from previous research studies when we look at the empirical literature related to economic growth and domestic investment. Evidence from Japan, Lee (2010) finds long-run positive unidirectional causality from OFDI to GDP per capita using time series data. There is no Granger causality relationship between outward FDI and GDP per capita in short run. Using time series dataset, Herzer and Schrooten (2008) find that OFDI has positive long-run effects on domestic investment in the case of US, but in Germany, this complementary relationship only exists in the short run, where OFDI have inverse relationship with domestic investment in Germany in the long run.

Steven and Lipsey (1992), using firm-level data of seven U.S. multinationals for time period 16 to 20 years, conclude that OFDI and domestic investment are positively interlinked or associated.Desai *et al.* (2005) claim that OFDI allows firms to import raw material from foreign associates at cheap rates and boost exports of intermediate goods used by foreign partners. Industry combines home production with foreign firms to decrease cost of production, and reap economies of scale as a result boost domestic output and domestic investment. Thus, these research studies have investigated impact of large multinational firms, they do not show the broad effect of OFDI on domestic investment when all (i.e., small, medium, and large) firms increase their FDI outflows. The overall effect of OFDI on domestic investment is inconclusive and has become an empirical issue. Hejazi and Pauly (2003), using industrial database for Canada for the time period 1984 to 1995, find that the effects of outward FDI differ according to investment entity. Recent research studies by Hejazi and Pauly (2003), Arndt et al. (2007), and Al-Sadig (2013) conclude that combination of home and foreign production may have different effects by outward FDI on domestic investment, depending on overseas investment motives. Referring to different outward FDI motives (i.e., resource seeking, marketing seeking, efficiency-seeking, and strategic asset seeking) identified by Dunning (1993), they mention that outward FDI may impact domestic investment positively, negatively or neutrally.The main contribution of this study is that it is a first attempt at focusing on Asian economies to determine the impact of FDI inflows and FDI outflows on domestic investment using a panel data analysis and no previous research has been made on Asian economies related to this topic or area best to our

knowledge. We want to bridge this shortcoming in the existing literature by exploring how OFDI affects domestic investment in Asian countries by introducing new and interesting findings. We have used system-GMM to cope with possible endogeneity of FDI inflows and FDI outflows over the time span of 2004-2014 annually. Our findings are as follows: (1) there is a positive long-term relationship between FDI inflows and domestic investment; and system-GMM model results show that one dollar increase in FDI inflows leads to increase domestic investment by 0.3081 dollars (2) there is a negative long-term relationship between outward FDI and domestic investment; and system-GMM results show that one dollar increase in FDI outflows leads to decrease domestic investment by 0.2704 dollars. The paper is organized as follows: **Section 2** describes Data and Sample Selection **Section 3** defines Model. **Section 4** Estimation Methods. **Section 5** Empirical results and **Section 6** Concludes the results.

2. Data and sample selection

In this study, we have used net OFDI (% GDP), domestic investment (% GDP), trade (% GDP), Inflation (annual %), GDPG (annual %), Broad money supply (% GDP) and GDP deflator (base year varies by country).IFDI, OFDI and GDP are measured in current US dollars. Gross capital formation is used proxy for domestic investment. Inflation, GDP Deflator (annual %) is used proxy for inflation to measure macroeconomic instability. 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 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 outflows have negative values in some years, it is not possible to use logarithms. Thus, it is common practice in research to use the 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), and the GDP deflator are taken from World Bank (World Development Indicators Database). The sample consists of the 37 Asian economies over the time period of 2004-2014 annually. Countries included are the following: Armenia, Azerbaijan, Bahrain, Bangladesh, Brunei Darussalam, Cambodia, China, Georgia, China, Hong Kong SAR, China, Macao SAR, India, Indonesia, Iraq, Israel, Japan, Jordan, Kazakhstan, Korea, Rep. , Kuwait, Kyrgyz Republic, Lebanon, Lesotho, Malaysia, Mongolia, Oman, Pakistan, Philippines, Qatar, Russian Federation, Saudi Arabia, Singapore, Sri Lanka, Thailand, Timor-Leste, Turkey, United Arab Emirates and Vietnam. We were not able to include some countries in out sample due to missing data and the unavailability of data for some of the variables used in our study.

TABLE 1. Summary statistics (2004-2014)

Variables	No. of observations	Mean	Standard Deviation	Minimum	Maximum
DI	407	26.09	8.35	9.34	65.72
Lag of DI	370	26.14	8.53	9.34	65.72
IFDI	407	5.38	6.78	-14.36	45.28
OFDI	407	2.36	5.53	-7.81	49.05
GOV	407	0.00	1.00	-2.55	2.30
GDPG	407	5.99	5.49	-14.14	54.15
INFLATION	407	6.57	7.86	-25.12	39.17
TRADE	407	120.42	91.27	24.46	455.27
FD	407	67.84	67.55	-52.59	373.78
SAVINGS	407	27.76	26.63	-86.76	74.61
M2	407	83.35	65.53	14.13	362.04

Note; The variables are previous domestic investment (Lag of DI), Inward FDI (IFDI) Outward FDI (OFDI), Governance (GOV), Trade Openness (Trade), GDP Growth (GDPG), Broad Money Supply (M2), Domestic Savings (Savings), Financial Development (FD), and Inflation.

This study uses a governance dataset compiled by Worldwide Governance Indicators (WGI) over time span 2004-2014 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	0.9207	1.0000				
Political Stability	0.6842	0.6169	1.0000			
Regulatory Quality	0.8896	0.9420	0.6291	1.0000		
Rule of law	0.9480	0.9350	0.6715	0.9083	1.0000	
Voice and Accountability	0.4217	0.4451	0.1641	0.4031	0.4476	1.0000

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 used in our econometric model ranges from -2.55 to 2.30. 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) database.

3. 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, FDI inflows and a list of control variables that captures economic conditions in Asian economies. We have added this list of control variables, namely, Governance (GOV), GDP Growth (GDPG), broad money supply (M2), financial development (FD), gross domestic savings (Savings), 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 domestic investment.

$$DI_{i,t} = \alpha_0 + \alpha_1 DI_{i,t-1} + \alpha_2 IFDI_{i,t} + \alpha_3 OFDI_{i,t} + \alpha_4 GOV_{i,t} + \alpha_5 X'_{i,t}\beta + \varepsilon_{1it} \quad (1)$$

$$\varepsilon_{i,t} = \eta_i + \upsilon_{i,t}$$

where i = 1,2,3,...,N; t = 1,2,3,…T, i is the home country, t is the time, α_s and β are unknown parameters to be estimated, η is the unobserved country-specific effects, and ε is the random disturbance term. The dependent variable DI is the domestic investment measured by domestic investment as a share of GDP. 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 domestic investment is expected to have positive effects on current domestic investment because it may be a sign of good and healthy investment environment (Al-Sadiq, 2013). Each country's economic stability plays significant role in economic development. Macroeconomic instability causes uncertainty, and it is considered to have negative effects on domestic investment. Macroeconomic instability is measured by inflation rate and is generally considered to have a negative association (Greene and Villanueva, 1991; Serven and Solimano, 1993; Oshikoya, 1994; Ndikumana, 2000). Previous research studies have also highlighted the impact of trade openness on domestic investment. Trade openness may positively affect domestic investment through technology and knowledge spillovers (Ndikumana, 2000).Furthermore, a country's ability to attract and benefit from FDI is interrelated with institutional characteristics (Bevan, Estrin & Meyer, 2004) and as a result stimulate domestic investment. Roe & Siegel (2011) suggests that institutions that do not control corruption, do not secure property rights, and do not support government interventions decrease investment. Several previous research studies show that countries with poor governance reduce domestic investment (Acemoglu, Johnson & Robinson, 2005). Domestic savings play pivotal role in financing domestic investment in developing economies (Agènor, 2004).Feldstein and Horioka (1980) concluded that savings and investment are positively correlated. Ndikumana (2000) argue that developed financial markets increase availability of credit for investors and boost domestic investment. From previous studies, GDPG and Broad money supply (M2) is expected to have positive effects on

domestic investment; thus, it is generally assumed that GDPG and Broad money supply (M2) is positively associated with domestic investment.

4. Estimation method

We use the system-Generalized Method of Moments (GMM) 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 domestic investment 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 domestic investment. 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 domestic investment. Thus, there is a two-way causality running between domestic investment and FDI inflows as well as domestic investment 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 (2).

$$DI_{i,t} - DI_{i,t-1} = \alpha_1(DI_{i,t-1} - DI_{i,t-1}) + \alpha_2\,(IFDI_{i,t} - IFDI_{i,t-1}) + \alpha_3(OFDI_{i,t} - OFDI_{i,t-1}) + \alpha_4\,(GOV_{i,t} - GOV_{i,t-1}) + \beta'(X_{i,t} - X_{i,t-1})(\boldsymbol{v_{i,t} - v_{i,t-1}}) + \boldsymbol{\varepsilon_{i,t}} \ldots \textbf{(2)}$$

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 (2), 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 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 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.

4. Empirical results

Some studies employ cross-sectional regressions to test the relationship between FDI inflows, FDI outflows and domestic investment. This study starts with cross-sectional analysis in order to test relationship between FDI inflows, FDI outflows and domestic investment over time span 2004 to 2014 annually. The OLS cross-sectional results are reported in Table 3. Table 3 OLS cross-sectional results show that estimated coefficient of outward FDI is negative and significant at 5 % and 10 % level of significance. The negative and significant relationship between outward FDI and domestic investment remains unchanged using aggregate Governance and individual governance indicators along with explanatory variables as displayed in Table 3 in models 1-7. OLS results show that estimated coefficient of inward FDI is positive and significant at 1 % level of significance. The positive and significant effects of FDI inflows on domestic investment remain unchanged using aggregate governance and individual governance indicators along with other control variables, as reported in Table 3 in models 1-7. Indeed,

the cross-sectional regression results show that there is a strong positive relationship between FDI inflows and its domestic investment. Yet, cross-sectional analysis ignores time-series fluctuations and only tests the relationship between outward FDI, FDI inflows and domestic investment 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.

Table 3 Ordinary Least Squares (OLS)

Dependent Variable : Domestic Investment/GDP: 2002-2014 (OLS)

Independent variables	1	2	3	4	5	6	7
Lag of DI	.79183***	.7913***	.79144***	.78488***	.7852***	.79198***	.7914***
	20.62	20.60	20.69	20.53	20.22	20.74	20.68
IFDI	.17273***	.17375***	.17346***	.15646**	.18826***	.17241***	.17327***
	2.43	2.47	2.47	2.14	2.62	2.47	2.49
OFDI	-.18896***	-.18728***	-.1881***	-.19323***	-.18046***	-.1898***	-.1875***
	-2.71	-2.70	-2.73	-2.85	-2.69	-2.72	-2.70
GOV	.01025						
	0.03						
Control of corruption		-.04565					
		-0.14					
Government effectiveness			-.03022				
			-0.08				
Political stability				.4195			
				1.44			
Regulatory quality					-.4876		
					-1.15		
Rule of law						.04835	
						0.13	
Voice and accountability							-.06852
							-0.18
GDPG	.15193**	.15159**	.15156**	.1587**	.1462**	.15226**	.15236**
	1.97	1.97	1.97	2.07	1.91	1.97	1.98
INFLATION	.01478	.01381	.01405	.01831	.00720	.0153	.01401
	0.49	0.46	0.46	0.62	0.24	0.51	0.47
TRADE	.00022	.00038	.00030	-.00073	.00070	.00015	.00026
	0.07	0.12	0.10	-0.23	0.23	0.05	0.09
FD	.00386	.00421	.00409	.00210	.00554	.00366	.00417
	0.46	0.51	0.49	0.26	0.71	0.45	0.52
SAVINGS	-.00783	-.00730	-.00736	-.01331	-.00210	-.00826	-.0082
	-0.53	-0.51	-0.50	-0.89	-0.14	-0.56	-0.60
M2	.00370	.00351	.00364	.00576	.00339	.00378	.00364
	0.40	0.38	0.40	0.61	0.39	0.41	0.41
Constant	3.7175***	3.6829***	3.7010***	4.2903***	3.6292	.00378***	3.6801***
	4.07	4.03	4.11	4.39	4.09***	0.41	4.18
No of Observations	370	370	370	370	370	370	370
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

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 previous domestic investment (Lag of DI), Inward FDI (IFDI) Outward FDI (OFDI), Governance (GOV), Trade Openness (Trade), GDP Growth (GDPG), Broad Money Supply (M2), Domestic Savings (Savings), Financial Development (FD), and Inflation.

Table 4 contains the principal empirical result findings and reports results for System GMM in columns (1)-(7). Across columns (1)-(7) in Table 4, our general result findings is that, in all cases, FDI inflows has consistently positive and significant effects on domestic investment particularly at 1% level of significance, a 1% increase in FDI inflows increases domestic investment in range of 30.81% - 37.04 %.Our result findings show across models (1)-(7) in Table 4, in all cases, Governance has insignificant effects on domestic investment. We can infer from our result findings that Governance effects are not significant on domestic investment, may be governance indicators are not strong enough to significantly increase outward FDI and boost domestic investment. Now, we explain results in detail.

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 robust with different model specifications. From our findings, in all cases, FDI inflows have consistently significant and positive impacts on domestic investment at the 1% level of significance. Regarding OFDI in Table 4, a one

percent increase in FDI in00flows lead to increase in domestic investment by 30.81% in model 1, 32.66 % in model 2, 35.68% in model 3, 37.04% in model 4, 34.62% in model 5, 32.99% in model 6, and 31.63 % in model 7. FDI outflows have the largest impact on domestic investment in model 5.The significance of the positive relationship between FDI outflows and domestic investment remains unchanged, even after using individual governance indicators along with explanatory variables in Table 4 in models 1-7. The positive and significant effects of FDI outflows on domestic investment 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.

As results reported in Table 4, the estimated results for outward FDI is statistically significant and negative at 5 % and 10 % level of significance. The estimated coefficients are robust with different model specifications. From our findings, in all models, outward FDI has significant and negative effects on domestic investment at the 10% level of significance. Regarding OFDI in Table 4, a one percent increase in outward FDI decreases domestic investment by 27.04% in model 1, 25.835 % in model 3, 31.03 % in model 4, 36.42 % in model 6, and 26.675 % in model 7.The significance of negative relationship between outward FDI and domestic investment remains unchanged, even after using individual governance indicators along with independent and control variables in Table 4 in models 1-7. The negative and significant effects of FDI outflows on domestic investment 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.

Now, We discuss other two very important variables in our model: domestic investment and governance. Domestic investment in previous years (lagged dependent variable) have positive and significant effects on current domestic investment in all models. The result findings displayed in Table 4 show that past domestic investment robustly enhances the current domestic investment rate. Across models 1-7 in Table 4, our general findings show that domestic investment in previous years have consistently highly positive and significant effects on current domestic investment, particularly at the 1% level of significance, and a 1% increase in Domestic investment in previous years increases current domestic investment in range of 66.16 % - 68.21%.As results reported in Table 4, a one percent increase in the lagged dependent variable (domestic investment in previous years) leads to an increase in domestic investment by 68.21% in model 1, 67.80 % in model 2, 66.16 % in model 3, 66.69 % in model 4, 66.39 % in model 5, 66.53 % in model 6, and 67.814 % in model 7. As result findings displayed in Table 4 show that governance has insignificant impact on domestic investment. More importantly, it confirms that the level of governance support is not strong enough to significantly increase outward FDI and boost investment. Thus, governance should be significantly strong enough to gain economies of scale and increase inward and outward FDI as a result boost domestic investment.

In Table 4, 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 domestic investment, IFDI, OFDI, and Governance. In order to control for endogeneity between domestic investment, IFDI and OFDI, we include control variables in our econometric model. We include set of control variables, namely, GOV, GDPG, INFLATION, TRADE, FD, SAVINGS and M2, given their strong influence found in previous research studies and recent studies by Al-Sadiq (2013).Domestic investment in previous years has the largest impact on current domestic investment in models 6 and 7. Results show that other control variables such GOV, INFLATION, TRADE, Financial Development (FD), SAVINGS and M2 (Broad money supply) which implies that domestic investment is unresponsive to GOV, INFLATION, TRADE, FD, SAVINGS and M2.

Table 4 System-Generalized Method of Moments (GMM)

Dependent Variable : Domestic Investment/GDP: 2002-2014 (System- GMM)

Independent variables	1	2	3	4	5	6	7
Lag of DI	.6821***	.6780***	.6616***	.6669***	.6639***	.6653***	.67814***
	12.73	9.62	10.72	10.99	8.91	10.90	9.64
IFDI	.3081***	.3266***	. 3568***	.3704***	.3462***	.3299***	.3163***
	3.17	2.90	3.53	2.93	3.50	3.71	2.95
OFDI	-.2704*	-.2661	-.25835*	-.3103**	-.2018	-.3642***	-.26675*
	-1.88	-1.29	-1.76	-2.06	-1.21	-2.93	-1.80
GOV	.0158						
	0.03						
Control of corruption		-.6313					
		-0.98					
Government effectiveness			-.5461				
			-0.87				
Political stability				.3585			
				0.94			
Regulatory quality					-.4596		
					-0.30		
Rule of law						.2257	
						0.31	
Voice and accountability							-.75472
							-1.30
GDPG	.2211***	.2109**	.2014**	.2070***	.1882**	.2150**	.2560***
	2.84	2.03	2.16	2.40	1.89	2.30	2.67
INFLATION	.0036	-.0176	-.0126	.02870	-.0447	.00956	-.02443
	0.08	-0.39	-0.31	0.69	-1.04	0.24	-0.61
TRADE	.00361	-.0013	-.00131	-.00026	-.0111	-.00256	-.00736
	0.65	-0.19	-0.18	-0.04	-0.79	-0.39	-0.95
FD	.0158	.0132	.0112	.01727	.00441	.01171	.00638
	1.56	1.12	0.90	1.17	0.31	1.06	0.58
SAVINGS	-.0062	.00406	.00393	-.00428	.00848	.00260	.00458
	-0.34	0.19	0.19	-0.22	0.34	0.13	0.23
M2	-.0095	-.00303	.00082	-.00900	.00462	.00287	.01054
	-0.68	-0.21	0.05	-0.54	0.35	0.19	0.72
Constant	5.5250***	5.5378***	5.5903***	5.9722***	7.4809**	5.8253***	5.3872***
	3.67	3.10	3.47	3.45	2.14	3.42	3.47
No of Observations	370	370	370	370	370	370	370
ar1(p-value)	0.001	0.001	0.001	0.001	0.001	0.001	0.002
ar2(p-value)	0.277	0.320	0.323	0.255	0.411	0.258	0.390
Sargan tests(p-value)	0.99	0.993	0.992	0.999	0.962	1.000	1.000
Difference in Hansen(p-value)	0.67	0.701	0.656	0.689	0.614	0.672	0.684

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 previous domestic investment (Lag of DI), Inward FDI (IFDI) Outward FDI (OFDI), Governance (GOV), Trade Openness (Trade), GDP Growth (GDPG), Broad Money Supply(M2), Domestic Savings(Savings), Financial Development(FD), and Inflation.

The Sargan test and serial correlation test results are displayed in Table 4. 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 4. Again, the Hansen tests do not reject the null hypothesis of the joint validity of all the instruments.

5. Conclusion

The primary motive of this study was to empirically test the relationship between outward FDI and domestic investment using panel data from Asian economies over the time period 2004-2014. Our estimates using system-GMM suggest that FDI inflows have positive effects on domestic investment and FDI outflows have negative effects on domestic investment. System-GMM estimator to tackle possible endogeneity issues of independent variables, especially inward FDI and outward FDI. Our system GMM results show that one dollar increase in outward FDI leads to decrease domestic investment by 0.2704 dollars in Asian economies because in most of the Asian are developing countries and financial markets are under developed as well as availability of capital is very scarce and savings are not abundant. Thus, Outward FDI is expected to have negative effects on domestic

investment if capital is scarce, savings are not abundant and financial markets are under developed. However, in countries where savings is abundant, the negative impact of outward FDI on domestic investment may be offset in the long run. Our system GMM results show that one dollar increase in FDI inflows leads to increase domestic investment by 0.3081 dollars because in Asian countries foreign direct inflows are very high in last two decades and it is expected that FDI inflows have positive effects on domestic investment in Asian economies. The economies where foreign direct investment inflows are high, the FDI inflows are expected to have positive effects on domestic investment. Our result findings comply with previous research studies such as Al-Sadiq (2013), Feldstein (1994), Hatzius (2000) and Steven and Lipsey (1992) .Our result findings also show that governance has a positive but insignificant effects on domestic investment which implies governance infrastructure is not strong in Asian economies to boost domestic investment. These results may be driven by presence of weak governance characteristics in Asian countries such as poor control of corruption, weak law and order, lack of political stability, government ineffectiveness, and lack of voice and accountability. Different types of policy will be needed to strengthen governance and institutions to significantly increase FDI inflows and FDI outflows and, as a result, increase domestic investment.

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