

Role of Foreign Direct Investment in Estimating Capital Mobility: A Reappraisal of Feldstein-Horioka Puzzle

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Abstract

Since investment by non-residents is not subject to inter-temporal budget constraint of the recipient country, it may not belong to Feldstein-Horioka equation. This paper finds that capital mobility is remarkably high in both developed as well as developing countries when foreign direct investment is excluded from domestic investment. Thus, such an estimated coefficient of savings rate reflects more precisely the extent to which domestic savings is used to finance domestic investment. Moreover, economic openness and financial liberalizations are also found to have increased the degree of capital mobility. This implies that a country can experience large current account deficits due to greater access to external borrowings, which can make up for shortfall in its domestic savings for investment. These findings are robust to improved and alternative econometric techniques.

JEL classification: F30; F02

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1. Introduction

Feldstein and Horioka (1980), hereafter FH, interpret their findings of high correlation between domestic savings and domestic investment as an evidence of low international capital

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mobility. This led to the controversial conclusion of the existence of strong home bias the way domestic savings are allocated. Obviously, this went against the conventional wisdom that industrialized economies had fewer restrictions on the across border movement of capital. Thus, in the face of international financial markets integration, FH finding of capital immobility for OECD countries has been called a “puzzle” (see Obstfeld and Rogoff, 2000).¹

One policy implication of FH conclusion is that if domestic investment is closely associated with domestic savings, then policies designed to augment domestic savings would increase domestic investment. But, if they are not closely linked, then such policies will not be effective (Schmidt, 2003). However, one problem with the conventional way of gauging capital mobility based on the correlation between domestic savings and domestic investment lies with the inclusion of foreign direct investment (FDI) in the latter. In this case, the estimated savings retention coefficient will not reflect the extent to which domestic savings of a country is used to finance domestic investment by its residents.² Following Rossini and Zanghieri (2003), this study also argues that since investment by non-residents is not subject to inter-temporal budget constraint of the recipient country, it may not belong to FH equation. In other words, since FDI is not financed by the savings of the residents of recipient countries, it should not be included while estimating the savings-investment correlation.

High savings-investment correlation can also arise from excessive capital control, which inhibits the across border movement of portfolio and direct investment. On the other hand,

¹ Subsequent research also finds high savings-investment correlation in large as well as small economies, although, this correlation is found to be relatively weaker for the latter (Dooley, Frankel and Mathieson, 1987; Wong, 1990; Mamingi, 1997; Vamvakidis and Wacziarg, 1998; Coakley, Kulasi and Smith, 1999; Kasuga, 2004; Sinha and Sinha, 2004). A few recent studies employing panel data model in augmented FH specification conclude that financial openness has increased capital mobility in the world (Isaksson, 2001; Georgopoulos and Hejazi, 2005; Younas, 2007; Younas and Chakraborty, 2009).

² The coefficient on savings rate is also called saving retention coefficient as it shows the extent to which an increase in domestic savings is used to finance domestic investment or in other words the fraction of a dollar savings that is invested domestically (Georgopoulos and Hejazi, 2005).

financial market liberalizations reduces the cost of investing abroad and, thus, domestic savings is financed wherever it can earn highest marginal returns in the world. So, this process of economic openness can weaken savings-investment correlation. However, it is also reasonable to assume that some home bias in the allocation of domestic savings is inevitable due to information constraints and perceived risks associated with investment abroad (Younas and Chakraborty, 2009).

This paper reexamines the savings-investment correlation for developed OECD as well as developing countries, separately, for the period 1970-2005 by incorporating the followings in the augmented FH equation: (i) Independent variable in his study is derived by subtracting inward FDI from domestic investment. (ii) We use economic globalization index to explicitly examine the impact of economic openness and financial liberalization on capital mobility. (iii) In addition, we also control for the amount of foreign aid a country receives as it increases the overall availability of funds for investment. (iv) To address a host of econometric issues, we use both feasible generalized least squares (FGLS) and dynamic panel generalized method of moments (GMM) estimation technique to derive results.³

Our findings suggest that capital is remarkably more mobile in both developed as well as developing countries when FDI is excluded from domestic investment of the recipient country. Moreover, economic openness and financial liberalization are also found to have increased the degree of capital mobility. This implies that a country can experience large current account deficits due to greater access to external borrowings, which can make up for shortfall in its domestic savings for investment.

³ Dynamic panel generalized method of moments (GMM) estimation technique proposed by Arellano and Bond (1991) has only recently been used to study capital mobility in the FH literature (for example, Younas and Chakraborty, 2009).

The remainder of the paper proceeds as follows. The next section describes the empirical methodology and data. Section 3 presents the estimation results, while section 4 concludes.

2. The Empirical Methodology and Description of Data

Using long-run data averages for sixteen OECD countries, FH estimated savings-investment equation as given in (1), where I/Y and S/Y are domestic investment and domestic savings as a ratio to the GDP, respectively, for each country i .

$$\left(\frac{I}{Y}\right)_i = \alpha + \beta\left(\frac{S}{Y}\right)_i + \mu_i \quad (1)$$

FH interpret their findings of the value of β close to 1 as an evidence of low degree of capital mobility, or in other words, strong home in the allocation of domestic savings. The coefficient of savings rate suggests that changes in domestic savings ultimately change domestic investment by the same amount. On the other hand, the value of β close to zero indicates high degree of capital mobility implying a weak link between domestic investment and domestic savings where former is financed by the pool of worldwide savings.

Some researchers have found problems with the FH's empirical treatment for estimating savings-investment correlation. For example, Krol (1996) demonstrates that controlling for fixed effects in panel data models results in higher capital mobility. Inclusion of Luxembourg in the studies of OECD countries has also been attributed as a reason for the lower estimated value of savings retention coefficient (Hussein, 1997; Coiteux and Oliver, 2000). On the contrary, Ho (2002) argues that inclusion or exclusion of Luxembourg does not affect the estimated results, but what matters is the technique to estimate the model. Corbin (2001) using panel data model concludes that the high value of savings retention coefficient is not an evidence of lack of capital

mobility, but is attributable to the existence of country specific effects. While, Keun-Yeob et al. (1999) using panel data model still find significant home bias in the allocation of domestic savings. Younas and Debasish (2009) using dynamic panel data estimation technique find that economic and financial openness have increased capital mobility over time in the world.

This study reexamines the dynamic of savings-investment correlation by incorporating two major improvements in the existing literature. On the conceptual side, we argue that since FDI is not financed by the savings of the residents of the recipient country, it should be excluded from the domestic investment variable. In other words, investment by non-residents is not subject to the budget constraint of the recipient country, it may not belong to FH equation (Rossini and Zanghieri, 2003). The savings retention coefficient derived by excluding FDI from domestic investment would more precisely reflect the extent to which domestic savings is used to finance domestic investment.

On the technical side, we use improved and alternative econometric techniques to derive estimation results. First, we use feasible generalized least squares (FGLS) allowing for both time-specific effects and country-specific heteroskedasticity.⁴ Following Younas and Chakraborty (2009), we take one year lagged values of all independent variables in our model. The lagging of independent variable allows for the fact that it takes time for a dollar of savings to be transformed into fixed capital formation which measures investment. Besides significantly reducing any potential endogeneity of savings in the model, this technique also overcomes any problem of contemporaneous correlation.⁵ Consequently, investment data is over the period 1971

⁴ Inclusion of time-specific dummy variables is aimed to capture factors affecting capital mobility such as business cycle effects and changes in policy regimes, while country-specific dummy variables control for a country's size effect. Moreover, one time-specific and one country-specific dummy variable must be dropped to avoid perfect collinearity in the econometric model.

⁵ One may plausibly argue that savings is endogenous as it not only affects but may also be affected by investment. One alternative option to overcome this potential problem is to employ two-stage least square (2SLS) method. The

to 2005, while the data for all independent variables ranges from 1970 to 2004. We also follow standard practice of taking 5-year data averages to overcome any cyclical effects in the data.⁶ Therefore, our separate empirical models for twenty four OECD and seventy five developing countries take the following form:

a. OECD countries:

$$\left(\frac{I-FDI}{Y}\right)_{it} = \alpha_0 + \alpha_1 \left(\frac{S}{Y}\right)_{i,t-1} + \alpha_2 (EG)_{i,t-1} + \alpha_3 \left[EG \times \left(\frac{S}{Y}\right)\right]_{i,t-1} + \alpha_i + \lambda_{t-1} + \mu_{it} \quad (2)$$

b. Developing countries:

$$\left(\frac{I-FDI}{Y}\right)_{it} = \beta_0 + \beta_1 \left(\frac{S}{Y}\right)_{i,t-1} + \beta_2 (EG)_{i,t-1} + \beta_3 \left[EG \times \left(\frac{S}{Y}\right)\right]_{i,t-1} + \beta_4 \left(\frac{A}{Y}\right)_{i,t-1} + \beta_i + \eta_{t-1} + v_{it} \quad (3)$$

Where subscripts i and t indicate country and time period, respectively. I is gross fixed capital formation used to measure investment, FDI measures inward foreign direct investment in a country, S is gross domestic savings, Y stands for gross domestic product, while A measures foreign aid to a developing country.⁷ Since foreign aid adds to the available funds for investment in the recipient country, it is important to include it in the model. As past studies argue, if foreign aid is important but omitted, the coefficient of savings rate would exaggerate the degree of capital mobility (Montiel, 1994; Isakson, 2001; Younas and Debasish, 2009). The data source for

problem with 2SLS is non-availability of valid instruments and their data especially for the developing countries. Isaksson (2001) used government consumption expenditures and dependency ratio (sum of the population ages between 0-14 and 65 and above divided by labor force of a country) as instruments for the savings rate. As also discussed by Younas and Chakraborty (2009), these are not valid instruments in this study as they have only a weak correlation with the savings rate.

⁶ See, for example, Bayoumi, 1990, Vamvakidis and Wacziarg, 1998; Isaksson, 2001; Kasuga, 2004; Younas, 2007; Younas and Debasish, 2009. Data for all variables is broken into separate 5-year data averages. Therefore, there are a total of 7 time periods.

⁷ Gross sSavings is calculated as gross domestic product minus private and government consumption expenditure, while gross fixed capital formation consists of outlays on additions to the fixed assets of the economy, net changes in the level of inventories, and net acquisitions of valuables, as defined in WDI (2007).

I , S , Y and A is World Bank Development Indicators (WDI, 2007), while data for FDI is taken from United Nations Conference on Trade and Development (UNCTAD, 2007).

EG is the KOF economic globalization index compiled by Dreher (2006). It is a weighted index of actual economic flows (both trade and capital flows), and the index of restrictions on trade and capital flows. Its higher value corresponds to more economic and financial openness in a country. The interactive variable, $EG \times \left(\frac{S}{Y}\right)$, examines the impact of increased financial liberalization on the degree of capital mobility. Since, financial market integration indicate reductions in the restrictions on across border movement of capital, we expect a negative sign with this interaction term, i.e., $\alpha_3(\beta_3) < 0$.

Following Younas and Debasish (2009), we also employ dynamic panel data generalized method of moments (GMM) estimation technique proposed by Arellano and Bond (1991) to further check robustness of our results. According to this technique, the model is transformed into two-step GMM estimator to eliminate the fixed effects, while lagged values of endogenous variables are used as suitable instruments to overcome any potential endogeneity.^{8,9} Thus, the transformed models in first differences take the following form:

a. *OECD countries:*

$$\left(\frac{I-FDI}{Y}\right)_{it} = \alpha_0 + \alpha_1 \left(\frac{I-FDI}{Y}\right)_{i,t-1} + \alpha_2 \left(\frac{S}{Y}\right)_{i,t-1} + \alpha_3 (EG)_{i,t-1} + \alpha_4 \left[EG \times \left(\frac{S}{Y}\right)\right]_{i,t-1} + \lambda_{t-1} + \mu_{it} \quad (4)$$

b. *Developing countries:*

⁸ In the presence of fixed effects, the lagged endogenous determinants will correlate with the error term, resulting in biased and inconsistent estimates for a panel with large cross-sections and short time periods.

⁹ We also checked the conditions of both validity of instruments and the absence of serial correlation in residuals for every regression.

$$\left(\frac{I-FDI}{Y}\right)_{it} = \beta_0 + \beta_1 \left(\frac{I-FDI}{Y}\right)_{i,t-1} + \beta_2 \left(\frac{S}{Y}\right)_{i,t-1} + \beta_3 (EG)_{i,t-1} + \beta_4 \left[EG \times \left(\frac{S}{Y}\right)\right]_{i,t-1} + \beta_5 \left(\frac{A}{Y}\right)_{i,t-1} + \gamma_{t-1} + v_{it} \quad (5)$$

Table 1 provides some descriptive statistics for both OECD as well as developing countries over the sample period. OECD countries have an average domestic investment rates of 22.6 percent with a maximum of 37.2 (South Korea) and a minimum of 14.2 (Turkey), while their average domestic investment rates net of FDI is 20.9 percent with a maximum of 36.9 (South Korea) and a minimum of 1 (Belgium). Their average savings rate is 23.3 percent with a maximum of 39.6 (Ireland) and a minimum of 11.8 (Greece). The average economic globalization index for them is 64.34 with a maximum of 95 (Ireland) and a minimum of 28.3 (South Korea). The higher values of this index suggest that there are least restrictions on the across border movements of capital in OECD countries.

On the other hand, average domestic investment rates for developing countries is 20.3 percent with a maximum of 45.8 (Singapore) and a minimum of 4.6 (Chad), while their average domestic investment rates net of FDI is 18.6 percent with a maximum of 45.2 (Botswana) and a minimum of 0.6 (Democratic Republic of Congo). It can be noted from table 1 that minimum savings rate for developing countries is -13.9 (Jordan). The negative savings implies that those economies are net borrowers in the international capital market which can be because of deficits in their current account and/or government budget. Moreover, their lower values of economic globalization index reflect higher restrictions on the movement of capital.

3. Estimation Results

3.1. *Feasible Generalized Least Squares (FGLS) with Fixed Effects*

First, we derive estimation results using feasible generalized least squares (FGLS) allowing for both time-specific effects and country-specific heteroskedasticity, as in equations (2) and (3). Table 2 presents the estimation results for OECD countries. To compare the degree of capital mobility, we also derive estimation results using both domestic investment rates and domestic investment rates net of FDI as independent variables, separately. The results for basic FH equation show that coefficient of savings rate is positive and significant at 1 percent level in both the regressions (columns 1 and 2). However, size of their magnitude suggests that the degree of capital mobility is higher when FDI is excluded from domestic investment. This suggests that actual correlation between domestic savings and domestic investment weakens when the latter is financed by the former alone.

Next we include economic globalization and its interaction term with the savings rate in our models (columns 3 and 4). These results show a positive effect of economic globalization on investment rates in OECD countries. More important, the negative and significant coefficients of its interaction term with the savings rate indicate that economic openness and financial market liberalizations have led to increase in capital mobility. We evaluate marginal effect of savings rate (MES) on investment at twenty five percent and fifty percent above the mean value of economic globalization index to calculate the actual value of savings retention coefficients. Their estimated actual size in table 3 shows that capital is remarkably more mobile when FDI is excluded from domestic investment. Lower values of likelihood ratio tests suggest that econometric models in columns 3 and 4 are preferred specifications than those estimated in columns 1 and 2.

The regression results for developing countries are presented in table 3. Their results for basic FH equation also show that the savings retention coefficient is lower in value when FDI is excluded from domestic investment. Comparison of results in table 2 and 3 reveals that capital is more mobile in developing countries than OECD countries.

As expected, the coefficient of the interaction term of economic globalization and savings rate is negative and statistically significant at 1 percent level (columns 3 and 4). We further evaluate the actual size of the savings retention coefficient by calculating the MES on investment both at twenty five and fifty percent above the mean value of economic globalization index. A substantial decline in the savings retention coefficients suggests that economic openness has increased capital mobility in developing countries. Like OECD countries, this impact on capital mobility is substantially higher when FDI is excluded from domestic investment.

Now we include foreign aid in the regressions for the reason discussed in section 2 above. The positively significant coefficient of foreign aid suggests that investment in a developing country is also supported by the amount of foreign assistance it receives. Moreover, with the inclusion of foreign aid, the magnitude of the coefficient of savings rate also increases which implies relatively low capital mobility. This suggests that if foreign aid is important but omitted, the coefficient on savings rate would exaggerate the degree of capital mobility (Montiel, 1994; Isakson, 2001; Younas and Debasish, 2009). However, the actual savings retention coefficients calculated using MES on investment further confirms that capital is more mobile when FDI is excluded from domestic investment.

The above findings for both OECD as well as developing countries suggests that home bias in the allocation of domestic savings significantly declines when domestic investment is financed by domestic savings alone. Thus, such estimated coefficient of savings rate reflects

more precisely the extent to which domestic savings is used to finance domestic investment. Its lower value implies that most of the domestic capital leaves domestic boundaries to earn higher marginal returns in the world. Moreover, the degree of capital mobility further increases when a country liberalizes its financial markets and reduces on the movement of capital across border. This also implies that a country can experience larger current account deficit due to better access to external borrowings. The access to external capital can make up for shortfall in the domestic savings for investment in developing countries and help them grow faster during their phase of development (Prasad, Rajan and Subramanian 2006).

3.1. Arellano-Bond Generalized Method of Moments (GMM) Estimations

As discussed in section 2, we also derive estimation results using dynamic panel GMM estimators proposed by Arellano and Bond (1991). The main purpose of this exercise is to check whether our findings change by employing improved and alternative econometric technique. The concern about the potential endogeneity of savings rate which may still be the issue even after taking its lagged values is the primary reason for utilizing dynamic panel model. This technique also addresses host of other econometric issues, as discussed in section 2.

The results in tables 4 and 5 for OECD as well as developing countries, respectively, further confirm the above results with FGLS estimation that capital is remarkably more mobile when FDI is excluded from domestic investment. Moreover, the size of the savings retention coefficient for developing countries is considerably smaller when model is estimated using dynamic panel model (table 5). This further confirms capital mobility is substantially higher in developing countries than OECD countries. The interpretations of all other findings are the same

as mentioned above because the sign and significance of the estimated coefficients remain about the same.

4. Conclusion

FH's interpret their finding of high correlation between domestic savings and domestic investment as an evidence of low degree of capital mobility in OECD countries. Subsequent studies also find home bias the way domestic savings is allocated. However, this bias appears to have decreased due to economic openness and financial liberalizations in the world. This study argues that since investment by non-residents is not subject to inter-temporal budget constraint of the recipient country, it may not belong to FH equation. In an open economy, domestic investment is financed by the pool of worldwide savings. Therefore, a conclusion about the degree of capital mobility based on its correlation with domestic savings would be inappropriate.

Using improved and alternative estimation techniques, this paper finds that capital is remarkably more mobile when FDI is excluded from domestic investment of the recipient country. Thus, such an estimated coefficient of savings rate reflects more precisely the extent to which domestic savings is used to finance domestic investment. Moreover, economic openness and financial liberalization are also found to have increased the degree of capital mobility. This implies that a country can experience large current account deficits due to greater access to external borrowings, which can make up for shortfall in its domestic savings for investment. ■

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Table 1: Descriptive statistics

Variables	Obs.	Mean	S.D.	Minimum	Maximum	Index range
<i>OECD countries</i>						
Investment rates	168	22.55	4.11	14.24	37.17	—
Investment rates net of <i>FDI</i>	168	20.85	5.27	1.00	36.90	—
Savings rate	168	23.27	5.26	11.80	39.60	—
Economic globalization	168	64.34	16.20	28.30	95.00	0–100
<i>Developing countries</i>						
Investment rates	525	20.34	6.82	4.59	45.83	—
Investment rates net of <i>FDI</i>	525	18.62	6.55	0.63	45.22	—
Savings rate	525	17.89	13.10	–13.90	79.20	—
Economic globalization	462	41.85	17.29	7.90	94.90	0–100
Foreign aid	490	5.36	6.44	0	34.60	—

Note: A higher value of the globalization index corresponds to more economic and financial openness. Investments rates, savings rate and foreign aid are taken as a ratio to the GDP of a country. FDI stands for inward foreign direct investment.

Table 2: Estimation technique—Feasible generalized least squares (FGLS) with fixed effects
OECD countries

Dependent variable →	(1)	(2)	(3)	(4)
Independent variables ↓	(<i>I/Y</i>)	[(<i>I-FDI</i>)/ <i>Y</i>]	(<i>I/Y</i>)	[(<i>I-FDI</i>)/ <i>Y</i>]
$(S/Y)_{i,t-1}$	0.358 (9.20) ^{***}	0.299 (5.51) ^{***}	0.896 (7.75) ^{***}	1.001 (6.65) ^{***}
$(EG)_{i,t-1}$			0.158 (3.35) ^{***}	0.216 (3.32) ^{***}
$[EG \times (S/Y)]_{i,t-1}$			-0.008 (4.84) ^{***}	-0.011 (4.93) ^{***}
Country fixed effects	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Estimated coefficients	31	31	33	33
Wald chi-square	1049.20	846.22	1070.12	836.37
Log likelihood	-285.56	-327.27	-280.01	-322.08
Observations	168	168	168	168
^A $MES = \alpha_1 + \alpha_3 EG$			0.253	0.116
^B $MES = \alpha_1 + \alpha_3 EG$			0.124	-0.061

Note: All models were estimated using feasible generalized least squares allowing for country-specific heteroskedasticity and autocorrelation. Absolute t-values are shown in parentheses. Superscripts *** indicates significance at 1% level.

A: Marginal effect of savings on investment evaluated at twenty five percent above the mean value of economic globalization index.

B: Marginal effect of savings on investment evaluated at fifty percent above the mean value of economic globalization index.

Table 3: Estimation technique–Feasible generalized least squares (FGLS) with fixed effects
Developing countries

Dependent variable →	(1)	(2)	(3)	(4)	(5)	(6)
Independent variables ↓	(<i>I/Y</i>)	[(<i>I-FDI</i>)/ <i>Y</i>]	(<i>I/Y</i>)	[(<i>I-FDI</i>)/ <i>Y</i>]	(<i>I/Y</i>)	[(<i>I-FDI</i>)/ <i>Y</i>]
$(S/Y)_{i,t-1}$	0.226 (8.92) ^{***}	0.206 (8.42) ^{***}	0.578 (9.43) ^{***}	0.622 (10.16) ^{***}	0.665 (11.48) ^{***}	0.693 (11.73) ^{***}
$(EG)_{i,t-1}$			0.267 (7.21) ^{***}	0.174 (4.82) ^{***}	0.255 (7.18) ^{***}	0.173 (4.87) ^{***}
$[EG \times (S/Y)]_{i,t-1}$			-0.007 (5.86) ^{***}	-0.008 (6.54) ^{***}	-0.008 (6.59) ^{***}	-0.009 (7.21) ^{***}
$(A/Y)_{i,t-1}$					0.321 (7.08) ^{***}	0.223 (4.93) ^{***}
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Estimated coefficients	82	82	75	75	73	73
Wald chi-square	1050.20	1188.23	1090.23	1020.85	1256.99	1037.47
Log likelihood	-1340.81	-1322.25	-1155.93	-1136.98	-1089.53	-1080.06
Observations	525	525	462	462	441	441
^A $MES = \beta_1 + \beta_3 EG$			0.211	0.203	0.246	0.222
^B $MES = \beta_1 + \beta_3 EG$			0.139	0.120	0.163	0.128

Note: All models were estimated using feasible generalized least squares allowing for country-specific heteroskedasticity and autocorrelation. Absolute t-values are shown in parentheses. Superscripts *** indicates significance at 1% level.

A: Marginal effect of savings on investment evaluated at twenty five percent above the mean value of economic globalization index.

B: Marginal effect of savings on investment evaluated at fifty percent above the mean value of economic globalization index.

Table 4: Estimation technique–Arellano-Bond generalized method of moments (GMM) OECD countries

Dependent variable → Independent variables ↓	(1) (<i>I/Y</i>)	(2) [(<i>I-FDI</i>)/ <i>Y</i>]	(5) (<i>I/Y</i>)	(6) [(<i>I-FDI</i>)/ <i>Y</i>]
$(I/Y)_{i,t-1}$	0.346 (9.76) ^{***}		0.282 (6.15) ^{***}	
$[(I-FDI)/Y]_{i,t-1}$		0.223 (4.37) ^{**}		0.176 (1.98) ^{**}
$(S/Y)_{i,t-1}$	0.422 (11.61) ^{***}	0.399 (8.55) ^{***}	0.886 (10.77) ^{***}	0.919 (24.52) ^{***}
$(EG)_{i,t-1}$			0.201 (9.73) ^{***}	0.180 (8.33) ^{***}
$[EG \times (S/Y)]_{i,t-1}$			-0.007 (6.15) ^{***}	-0.010 (14.77) ^{***}
Sargan test (p-value) ¹	0.409	0.295	0.519	0.360
Wald chi-square	884.61	553.01	1269.70	2088.10
Serial correlation test (p-value) ²	0.968	0.333	0.895	0.198
Observations	120	120	120	120
^A $MES = \alpha_2 + \alpha_4 EG$			0.323	0.115
^B $MES = \alpha_2 + \alpha_4 EG$			0.210	-0.046

Note: Absolute t-values are shown in parentheses. Superscripts *** and ** indicate significance at 1% and 5% levels, respectively.

1. The null hypothesis is that the instruments are not correlated with the residuals.

2. The null hypothesis is that the error term in the first difference regression exhibits no second order serial correlation.

A: Marginal effect of savings on investment evaluated at twenty five percent above the mean value of economic globalization index.

B: Marginal effect of savings on investment evaluated at fifty percent above the mean value of economic globalization index.

Table 5: Estimation technique–Arellano-Bond generalized method of moments (GMM) Developing countries

Dependent variable →	(1)	(2)	(3)	(4)	(5)	(6)
Independent variables ↓	(<i>I/Y</i>)	$[(I-FDI)/Y]$	(<i>I/Y</i>)	$[(I-FDI)/Y]$	(<i>I/Y</i>)	$[(I-FDI)/Y]$
$(I/Y)_{i,t-1}$	0.643 (10.84) ^{***}		0.580 (7.95) ^{***}		0.509 (5.86) ^{***}	
$[(I-FDI)/Y]_{i,t-1}$		0.580 (9.12) ^{***}		0.528 (7.81) ^{***}		0.511 (6.46) ^{***}
$(S/Y)_{i,t-1}$	0.126 (2.94) ^{***}	0.073 (1.56)	0.283 (2.60) ^{***}	0.356 (3.60) ^{**}	0.355 (3.01) ^{***}	0.387 (3.34) ^{***}
$(EG)_{i,t-1}$			0.132 (2.38) ^{**}	0.109 (2.43) ^{**}	0.114 (2.10) ^{**}	0.094 (2.09) ^{**}
$[EG \times (S/Y)]_{i,t-1}$			-0.004 (2.05) ^{**}	-0.007 (3.84) ^{***}	-0.005 (2.50) ^{***}	-0.007 (3.68) ^{***}
$(A/Y)_{i,t-1}$					0.188 (2.20) ^{**}	0.094 (1.46)
Sargan test (p-value) ¹	0.288	0.308	0.415	0.504	0.450	0.551
Wald chi-square	180.72	127.79	192.58	190.08	231.43	181.94
Serial correlation test (p-value) ²	0.129	0.143	0.273	0.479	0.438	0.448
Observations	375	375	330	330	315	315
^A $MES = \beta_2 + \beta_4 EG$			0.074	-0.010	0.094	0.019
^B $MES = \beta_2 + \beta_4 EG$			0.032	-0.083	0.041	-0.052

Note: Absolute t-values are shown in parentheses. Superscripts *** and ** indicate significance at 1% and 5% levels, respectively.

1. The null hypothesis is that the instruments are not correlated with the residuals.

2. The null hypothesis is that the error term in the first difference regression exhibits no second order serial correlation.

A: Marginal effect of savings on investment evaluated at twenty five percent above the mean value of economic globalization index.

B: Marginal effect of savings on investment evaluated at fifty percent above the mean value of economic globalization index.