

Does FDI Crowd in or out Domestic Investment? New Evidence from Emerging Economies

Ahmed Kamaly

Associate Professor, Department of Economics, The American University in Cairo, Cairo, Egypt
Email: kamaly@aucegypt.edu

Received 18 February 2014; revised 16 March 2014; accepted 30 March 2014

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Abstract

Foreign direct investment (FDI) has been for a while now an acronym associated with improvement in competitiveness and economic growth. To assess the expediency of FDI, it is imperative to answer the following question: what is the dynamic effect of FDI on total investment? In other words, what is the effect of FDI on domestic investment (DI); does it crowd in or out domestic investment? Research addressing this question is relatively recent and its empirical findings are ambiguous. This paper attempts to dodge the pitfalls in the theoretical and especially the empirical literature in assessing the link between FDI and domestic investment. The paper develops a simple theoretical model which is commonly used in the literature to come up with a reduced-form equation. Using data on 16 emerging countries over a 30-year period, the empirical model is estimated as a system of equations where each equation represents a country. Grouping all individual country regression in one system of equations aims to take into account the common contemporaneous errors associated with global shocks affecting FDI flows. This system of equations is estimated using 3SLS to account for both the existence of contemporaneous errors among individual country equations as well as the endogeneity of FDI. Results show that in general the effect of FDI on DI is country specific; however, in most countries, on impact, FDI has a positive and significant effect on DI. In subsequent periods, FDI may crowd out DI. In most countries included in the sample, FDI has a neutral long-term effect on DI. Crowding in or crowding out effect of FDI on DI is only found in few countries. This indicates that the rule is the neutrality of FDI on DI and the exception is otherwise (whether crowding in or out).

Keywords

FDI, Domestic Investment, Crowding out, Crowding in, Emerging Economies, Three Stage Least Squares

1. Introduction and Motivation

Among the different types of capital flows, foreign direct investment (FDI) has been the type most preferred by policymakers to the extent that FDI indicators have been often used as national targets as well as a showcase on how receptive is the investment climate in a given country. This perception regarding the advantageous nature of FDI is rooted in the numerous studies appearing after the fall of Bretton Woods system which have argued for the large benefits of FDI in terms of growth and technology transfer to host countries especially if the host country is a developing one. For example, [1] shows that FDI is a significant contributor to growth even surpassing the one of domestic investment.

Interestingly, there has been a growing literature especially in the beginning of 2000s which started to question these advantageous benefits of FDI to host countries. An important strand of this literature attempts to specifically assess the effect of foreign direct investment (FDI) on domestic investment (DI)¹.

The literature has identified several factors affecting how FDI may influence DI². The kind or the composition of FDI in terms of Greenfield investment versus mergers and acquisitions (M&A) can play an important role in how FDI may influence DI. FDI taking the form of M&A does not add immediately to the productive capacity of the host country unless it is accompanied by expansion and new investment. [4] provided a number of arguments for why M&A may not lead to an increase in investment. Supporting this argument, [3] provided evidence that when more FDI inflows are channeled in the form of M&A, as in the case of the 1990s, the effect of FDI on investment will be smaller.

The nature of the sectors, which attract FDI inflows, may also influence the link between DI and FDI. When FDI inflows are used to produce new goods and services which are not supplied by domestic firms, this would add to DI as foreign firms will not compete with or replace domestic ones. In contrast, if multinational corporations (MNCs) enter into the domestic markets to produce goods and services which are already produced by local firms, then in this case FDI is likely to substitute local investment as MNCs can drive domestic firms out of the market [8]. On a more aggregate level, if FDI is concentrated in the tradable sector, there is little room for substitutability between FDI and DI as both domestic firms and MNCs operate in the global market. On the other hand, if MNCs enter into the domestic market to produce nontradable commodities, then in this case such FDI potentially can displace current or future DI.

Another important aspect influencing how DI responds to FDI inflows is the technological advantage associated with FDI. It is often argued that FDI brings along advanced technology and superior management techniques to the host country. These benefits are not confined within the boundaries of foreign firms but they spur unrelated domestic firms to invest in better technology and human capital through demonstration (contagion) effect [9] [10]. Yet, this technological superiority gives a significant edge to foreign firms over domestic ones competing in the same market leading eventually to the replacement of domestic firms with more efficient foreign ones [4].

A closely related aspect to the previous point is the idea of spillovers. When MNC enters into the domestic market, it interacts with local producers through backward and forward linkages creating positive spillovers for domestic firms [11]. These positive spillovers impel domestic firms to invest more and to adopt more efficient production techniques.

The interaction between MNCs and the domestic financial market is another critical area affecting DI. Capital inflows including FDI may increase the supply of loanable funds; hence, reducing the financial constraint facing domestic firms which by its turn spores more DI [12]. In contrast, it is possible that MNCs tap into the domestic financial system to finance their investment needs making the financial constraint more tied for domestic firms, as financial institutions prefer to finance the more reputable and sound MNCs [13].

Lastly, in their quest to attract FDI, countries often strengthen domestic institutions as well as adopt sound macroeconomic policies. This “home improvement” has benevolent side effects on DI since it improves the host country investment climate [14].

From the above discussion, it is apparent that the effect of FDI on DI is not easy to be predicted since it depends on a host of different factors which varied from one country to another and from one period to another [15]. Consequently, determining the effect of FDI on DI becomes an empirical question *par excellence* where

¹[2]-[5] are example of these studies.

²Clearly, FDI effects are not restricted to DI but rather have the potential to influence many aspects of the economy. For example, inflow of capital through FDI can give rise to a more efficient intertemporal consumption path [2]; creating labor income [6] as well as reducing agency problem associated with FDI risk sharing nature [7].

only the data can clear this ambiguity one country at a time. Hence, this research attempts to clear this ambiguity for 16 emerging economies by gauging the effect of FDI on DI. The paper builds on a partial adjustment model for capital stock with a FDI component to come up with an empirical model relating DI with FDI. Besides avoiding a number of common problems which plagued this strand of the literature such as the endogeneity of FDI and the definition of DI, the estimation procedure allows for a country specific effect of FDI on DI and at the same time takes into consideration the fact that shocks in the international capital market can potentially impinge on FDI directed to host countries.

The rest of this paper is organized as follows. Section two gives a brief exposition of the literature. Section three develops the theoretical model and from it the empirical one. Section four presents the estimation results and gauges the short-term and the long-term effect of DI on FDI on all the countries included in the estimation. Lastly, Section five concludes and draws some policy implications.

2. Brief Exposition of the Literature

Despite the fact that this strand of the literature focusing on whether FDI crowds in or out DI is relatively recent; however, it has thrived since the beginning of the new millennium. The rightful father of this branch of the literature is the one focusing on investigating how FDI affects economic growth in developing countries. This was done by including FDI as one explanatory variable in a typical growth regression³ [18]-[20].

Later the literature has focused more on the effect of FDI on investment along with the effect of FDI on economic growth⁴ [7] [22] [23]. However, some of these studies explicitly or implicitly [1] [7] have looked at the issue of whether FDI crowds in or out DI.

Given the importance of determining such important link between FDI and DI, studies have tried to look carefully on determining the direction and magnitude of this relationship. In general, studies could be divided to single country studies and cross-country studies. The former group of studies usually relies on time series analysis to estimate the relationship between FDI and DI. [24] has found that FDI neither crowds in or out DI in Korea, whereas [15] [25] have reported that FDI crowds in DI in Malaysia and Togo respectively.

Recent cross-country studies have shared with the former group the same curse of ambiguity. [26] has provided evidence in favor of crowding in story in South Asia for the period 1965-1996. [8] using a sample of three Eastern European countries during the 1990-2000 period have indicated that two countries exhibit crowding out and one country exhibits crowding in⁵. Using panel data covering the period 1971-2000 for 36 developing countries equally divided between Africa, Asia and Latin America, [4] have found that FDI has crowded out DI in Latin America, whereas in Africa and Asia, FDI had no effect on DI since FDI has increased dollar-for-dollar overall investment⁶. [11] [28] have reported a crowding in effect between FDI and DI for Commonwealth of Independent States and Sub-Saharan Africa respectively. Interestingly, [23] using a larger cross sectional dimension but shorter time series dimension has reported a net crowding out effect of FDI on DI for Sub-Saharan Africa. [5] using a large panel consisting of 50 developed and developing countries for the period 1970-2004 have found that the effect of FDI on DI differs between developed and developing countries as it is neutral for the former and positive for the latter.

These mixed results should not be surprising. Given the host of factors outlined in the first section which influence how FDI affects DI, one should expect a wide spectrum of results since it is almost impossible to find even two countries with identical characteristics. This precisely the main common weakness in these cross-section studies as they try to force a common effect across countries. Consequently, ambiguity arises with sample change even within a group of countries like Sub-Saharan Africa or Latin America.

Another problem, which plagued this empirical literature, is treating FDI as exogenous [4] [8] [26]. Nevertheless, as early as [7] [29], it has been argued that capital flows components should be treated as endogenous variables. Empirically, the endogeneity of FDI was confirmed by many studies such as [16] [30]. Hence including FDI as explanatory variable without “instrumenting” it has the potential of biasing the estimation results.

A few studies also suffer from a more fundamental problem. This problem is related to the difference between

³[16] has used more direct approach using a panel VAR model to show causal relationships between growth, FDI and DI, whereas [17] have used heterogeneous panel model to investigate the same link.

⁴For a summary of the literature on the link between FDI and economic growth see [21].

⁵It is not clear from this study how the authors have obtained results pertaining to each country with a sample of 11 years at best.

⁶Similar results were obtained by [27] but their sample was a mix between developed and developing countries covering the period 1992-2002.

investment and FDI. More precisely, in some studies, domestic investment is calculated as a residual from subtracting FDI inflows from gross fixed investment [5] [23]. This measure underestimates domestic investment since a significant part of FDI is transmitted in the form of M&A which is not investment from a national accounting perspective.

3. A Simple Theoretical Framework

To come up with the empirical model, we present a simple theoretical framework. This theoretical framework is widely used in this literature to relate FDI to investment [4] [7] [8] [31]. The model starts with the investment identity:

$$I_t \equiv I_{d,t} + I_{f,t} \quad (1)$$

where I_t , $I_{d,t}$ and $I_{f,t}$ are total investment, domestic investment and foreign investment respectively. $I_{f,t}$ which is not observable depends on the inflow of FDI (F):

$$I_{f,t} = \alpha_0 F_t + \alpha_1 F_{t-1} + \alpha_{t-2} F_{t-2} \quad (2)$$

Domestic investment is modeled as flow variable in a partial adjustment model for capital stock ($K_{d,t}$).

$$I_{d,t} = \lambda (K_{d,t}^* - K_{d,t}) \quad (3)$$

With $K_{d,t}^*$ denotes the desired capital stock and λ is a positive fraction representing the speed of adjustment.

Desired capital stock is assumed to be a function of expected growth in the economy (G_t^e), output gap (y_t) and user cost of capital (u_t).

$$K_{d,t}^* = \phi_0 + \phi_1 G_t^e + \phi_2 y_t + \phi_3 u_t \quad (4)$$

Finally, the last component of the model is the equation of motion of capital stock.

$$K_{d,t} = (1 - \delta) K_{d,t-1} + I_{d,t-1} \quad (5)$$

Using (4) and (5) in (3), we can get:

$$I_{d,t} = \lambda \phi_0 + \lambda \phi_1 G_t^e + \lambda \phi_2 y_t + \lambda \phi_3 u_t + [\lambda - (1 - \delta)] \lambda (1 - \delta)^2 K_{d,t-3} + \lambda^2 I_{d,t-2} + [\lambda - (1 - \delta)] \lambda (1 - \delta) I_{d,t-3} \quad (6)$$

Using Equations (2) and (6) in (1), we get:

$$I_t = \lambda \phi_0 + \lambda \phi_1 G_t^e + \lambda \phi_2 y_t + \lambda \phi_3 u_t + \lambda (1 - \delta)^2 [\lambda - (1 - \delta)] K_{d,t-3} + \lambda^2 I_{t-2} + \lambda (1 - \delta) [\lambda - (1 - \delta)] I_{t-3} + \alpha_0 F_t + \alpha_1 F_{t-1} + \alpha_2 F_{t-2} \quad (7)$$

where $\alpha'_2 = \alpha_2 - \lambda^2$

4. Empirical Model and Estimation Results

Given Equation (7)⁷, the empirical model can be expressed as:

$$I_{i,t} = \beta_0 + \beta_1 F_{i,t} + \beta_2 F_{i,t-1} + \beta_3 F_{i,t-2} + \beta_4 I_{i,t-2} + \beta_5 I_{i,t-3} + \beta_6 G_{i,t-1} + \beta_7 G_{i,t-2} + \beta_8 y_{i,t} + \beta_9 u_{i,t} + \varepsilon_{i,t} \quad (8)$$

Note that the term with $K_{d,t-3}$ was dropped from the empirical model since its coefficient is very small as both λ and δ are fractions. Also G_t^e is expressed in terms of its past values (G_{t-1} and G_{t-2}) assuming that agents form their expectations adaptively. As for the output gap (y_t) it is calculated as the difference between

⁷Despite the fact that this theoretical model follows [31]; however, the last equation of the model (Equation (7)) is not the same as the final equation they have derived. The principle difference is that a term containing I_{t-1} appears in their final equation but it does not appear in ours.

the actual output and the potential one⁸.

The sample of this model consists of 16 emerging economies covering the period 1978-2010. Those countries are Argentina (ARG), Chile (CHL), China (CHN), Columbia (COL), Egypt (EGY), India (IND), Indonesia (IDS), Israel (ISR), South Korea (KOR), Mexico (MEX), Malaysia (MLY), Morocco (MOR), Peru (PER), Philippine (PHL), South Africa (SA) and Thailand (THL). The data is obtained from International Financial Statistics online database. Equation (8) includes a term for the user cost of capital; however, this variable was dropped from the empirical model since it turned to be mostly insignificant⁹.

As argued previously, the question of whether FDI crowds in or out DI should be settled empirically since it depends on a host of factors which are bound to vary from one country to another. Hence, one should not assume that the effect of FDI on DI is homogeneous across countries but rather it differs from one country to another. Estimation procedure should allow for this heterogeneity of effects. Panel data models assuming slope homogeneity suffer from aggregation bias where the estimation procedure forces the same effect of FDI on DI across countries. To avoid this bias, Equation (8) is estimated separately for each country. In addition, endogeneity of FDI should be taken into account when FDI appears as explanatory variable for investment.

To address these two important points, Equation (8) was estimated using two-stage least squares (2SLS)¹⁰. Results of the estimation are presented in **Table 1**. The estimated coefficients enable us to obtain the immediate (contemporaneous) as well as the long-term effect of FDI on investment for each country by itself included in the sample. A quick inspection of the results confirms our conjecture that the effect of FDI on investment is country specific since the magnitude and the direction of the FDI coefficients varied significantly across emerging markets.

Table 1. Two stage least squares results.

Variable	ARG	CHL	CHN	COL	EGY	IDS	IND	ISR	KOR	MEX	MLY	MOR	PER	PHL	SA	THL
G_{t-1}	0.30***	0.56***	0.14	-0.15	0.06	0.11	0.57***	0.39*	0.27	0.15*	0.91***	-0.03	0.33*	0.37	0.31	0.66***
	-0.10	-0.10	-0.37	-0.21	-0.56	-0.19	-0.17	-0.20	-0.18	-0.09	-0.26	-0.17	-0.17	-0.26	-0.20	-0.15
G_{t-2}	-0.06	-0.02	0.05	-0.09	0.13	-0.17	0.32	0.06	0.14	-0.07	-0.15	0.06	0.20	-0.12	0.27	0.68**
	-0.18	-0.13	-0.48	-0.20	-0.52	-0.28	-0.19	-0.19	-0.18	-0.13	-0.36	-0.15	-0.16	-0.26	-0.19	-0.27
y	0.04	0.29	0.00	0.73***	0.03	-0.11	-0.11***	0.33	0.11	0.04**	0.25	-0.35	0.39	0.75**	0.24	0.12
	-0.04	-0.25	-0.02	-0.20	-0.80	-0.22	-0.03	-0.25	-0.06	-0.02	-0.29	-0.67	-0.31	-0.30	-0.16	-0.10
F	0.32	-0.09	1.90	0.39	-0.14	3.16	-1.63	-0.04	0.67	-0.26	0.74	1.44	-1.59	2.40*	-0.36	-1.97***
	-0.51	-0.31	-1.33	-0.49	-1.06	-2.64	-1.09	-0.26	-5.46	-0.61	-0.78	-0.94	-1.25	-1.38	-0.45	-0.63
F_{t-1}	-0.01	0.29	-0.93	0.35	0.81	-0.50	0.39	-0.37	0.67	0.09	-0.24	0.26	0.46	-0.54	0.10	1.78**
	-0.38	-0.24	-1.49	-0.39	-1.27	-0.93	-0.99	-0.24	-4.98	-0.58	-0.89	-0.65	-0.71	-0.63	-0.27	-0.70
F_{t-2}	-0.09	0.01	-0.55	0.36	-0.22	0.84	-0.62**	-0.21	-1.13	0.66*	0.48	0.12	-0.06	-1.03	0.29	0.05
	-0.34	-0.22	-0.96	-0.34	-0.76	-0.93	-0.87	-0.21	-2.13	-0.38	-0.68	-0.60	-0.58	-0.75	-0.27	-0.49
I_{t-2}	0.55	0.56**	0.75	-0.09	0.66*	0.38	0.92	0.29	0.71*	0.54*	0.88**	0.74*	0.32	0.53	1.04**	0.29
	-0.51	-0.24	-0.49	-0.29	-0.38	-0.41	-0.35	-0.27	-0.37	-0.29	-0.34	-0.39	-0.24	-0.33	-0.39	-0.38
I_{t-3}	-0.12	-0.17	-0.34	-0.12	-0.49	-0.18	0.40	-0.06	0.08	-0.51*	-0.52	-0.47	-0.07	0.46	-0.11	-0.04
	-0.60	-0.28	-0.64	-0.32	-0.53	-0.61	-0.43	-0.31	-0.56	-0.29	-0.44	-0.62	-0.27	-0.43	-0.66	-0.45
I_{t-4}	-0.14	0.06	0.66	-0.49*	0.56	0.45	-0.14	-0.01	-0.24	0.17	0.17	0.20	-0.46*	-0.41	-0.15	0.25
	-0.22	-0.18	-0.48	-0.28	-0.35	-0.39	-0.32	-0.22	-0.33	-0.16	-0.25	-0.47	-0.26	-0.28	-0.39	-0.21
R-squared	0.70	0.85	0.71	0.69	0.49	0.64	0.92	0.68	0.72	0.62	0.84	0.61	0.52	0.58	0.87	0.92
Adj-R-squared	0.56	0.78	0.55	0.52	0.24	0.46	0.88	0.52	0.59	0.44	0.77	0.42	0.30	0.37	0.81	0.89
S.E. of regression	2.30	1.84	3.58	1.85	4.22	2.56	1.42	1.75	2.33	1.17	3.79	2.75	3.16	2.39	1.66	2.28
F-statistic	5.10	11.85	4.63	4.31	2.02	4.26	24.11	4.20	5.42	3.36	11.02	3.71	3.36	3.86	14.11	26.26
Prob (F-statistic)	0.00	0.00	0.00	0.01	0.10	0.00	0.00	0.01	0.00	0.01	0.00	0.01	0.01	0.01	0.00	0.00

⁸Potential output is obtained using Hodrick-Prescott filter.

⁹The proxy for the user cost of capital was the international interest calculated as the weighted average of the G7 interest rates. Regression results are not reported but they can be obtained from the author upon request.

¹⁰The choice of instrumental variables is based on the most important factors affecting FDI as identified in the empirical literature on the determinants of FDI.

Despite the fact that 2SLS addresses the issue of endogeneity of FDI flows; however, it does not take into account the fact that emerging economies are subject to common shocks affecting the international capital flows. Since these shocks affect countries at the same time, errors from each country equation should be correlated across countries. At the same time, the variance of errors for each country should be different across countries. As a result, one should expect that errors across country equations are correlated but heteroskedastic. Seemingly Unrelated Regressions (SUR) estimation procedure has the advantage of accounting for heteroskedasticity and contemporaneous errors across equations. Accordingly, the appropriate and more efficient estimation procedure should be a combination of SUR estimation procedure and 2SLS which is precisely what three-stage least squares (3SLS) does. Hence, 3SLS is used to estimate all country regressions simultaneously in a system of equations.

Table 2 depicts a summary of the estimation results. Comparing the results of 2SLS (**Table 1**) and 3SLS (**Table 2**), it is apparent that the significance of the most of the estimated coefficients has improved significantly under 3SLS. Since the 3SLS estimation gives more reliable results as argued above, we concentrate on these results in our analysis¹¹. Given the empirical model, one can gauge the immediate effect of FDI on investment as well as the long-term effect¹². If the long-term effect is greater than one, this indicates a case of crowding in but if the long-term effect is less than one, this points to a case of crowding out. Several interesting points can be drawn from the obtained results.

First, the diagnostic statistics for the overall regression for most of the individual country regressions indicate that the empirical model explains a great deal of the variation in the dependent variable (Investment as a ratio of GDP). Nevertheless, for a few countries (Egypt, Columbia, Morocco and Peru), the model only succeeded in explaining less than 50% of the variation in the dependent variable. This indicates that for those countries, the proposed theoretical framework may be not the best one to explain the behavior of investment.

Second, the effect of FDI on investment and DI is quite varied across countries. The magnitude and the direction of FDI coefficients exhibit great variation from one country to another and from one lagged to another. This affirms our earlier prediction that the effect of FDI on DI and investment is country specific since there are many factors contribute into how FDI affects investment. Hence forcing one specific effect across countries is very misleading and empirical models imposing this restriction suffer from aggregation bias.

Third, the immediate effect of FDI on investment is mostly positive (**Table 3**); however, in few countries namely Mexico and Thailand, this effect is negative and significant. As for the effects of the lagged FDI values of investment, they are almost equally divided between negative and positive effects.

In order to formally determine whether FDI crowds in or out domestic investment, one needs to examine the long-term effect of one dollar of FDI on investment. If a one dollar of FDI brings about a more than one dollar of investment, this means that not only FDI adds to total investment by its full amount but also FDI stimulates DI to increase. In this case, one concludes that FDI crowds in DI. If a one dollar of FDI brings about exactly one dollar of investment, then there is one-to-one relation between FDI and total investment. So whenever FDI changes, investment would change with the same amount. In this case, DI is not affected by FDI and the effect of FDI on DI is neutral. Lastly, it is possible that FDI affects negatively DI. In this case, total investment would not increase with the full amount of FDI but with less and the long term impact will be less than one.

Using the estimated coefficients for each country, we carry out the test statistics that $\gamma \gtrless 1$. If $\gamma < 1$, then there is evidence of crowding out (CO). If $\gamma = 1$, then there is evidence of neutral effect (N) of FDI on DI. Finally, if $\gamma > 1$, then there is evidence of crowding in (CI). **Table 4** presents the results of this test statistic performed separately on each country.

As shown in **Table 4**, in most countries (12 out of 16) the effect of FDI on DI is neutral. Evidence of CO is found in only three countries (Israel, Mexico and Peru), whereas CI is only confirmed in Morocco. This result points to the fact that indeed the effect of FDI on DI differs from one country to another depending on countries' characteristics; however, the rule is that in the long-term, changes in FDI only affect investment through its effect on foreign investment leaving DI intact. This does not mean that FDI does not affect DI but rather that the positive and the negative effects tend to balance out in most countries.

¹¹To test for autocorrelation, the multivariate Box-Pierce/Ljung-Box Q -statistics for residual serial correlation was performed with order three and the null hypothesis of no serial correlation could not be rejected.

¹²Long term effect is defined as $\gamma = \frac{\sum_{i=0}^{\infty} F_{t-i}}{1 - I_{t-2}}$.

Table 2. Three stage least squares results.

Variable	ARG	CHL	CHN	COL	EGY	IDS	IND	ISR	KOR	MEX	MLY	MOR	PER	PHL	SA	THL
G_{t-1}	0.31***	0.50***	0.13	0.00	-0.28	0.10	0.34***	0.33***	0.26***	0.15***	0.85***	0.06	0.37***	0.34**	0.28***	0.59***
	-0.06	-0.07	-0.21	-0.13	-0.31	-0.07	-0.11	-0.10	-0.07	-0.05	-0.17	-0.08	-0.09	-0.14	-0.11	-0.10
G_{t-2}	0.05	0.03	-0.54**	-0.03	-0.07	-0.11	0.12	0.06	0.17**	0.10*	0.09	0.10	0.22***	-0.04	0.25**	0.38***
	-0.06	-0.07	-0.23	-0.12	-0.27	-0.09	-0.08	-0.09	-0.07	-0.06	-0.17	-0.08	-0.08	-0.11	-0.10	-0.12
y	0.03	0.16	0.01	0.53***	-0.67	-0.01	-0.09***	0.51***	0.09***	0.05***	0.42**	-0.69**	0.32**	0.90***	0.21**	0.06
	-0.02	-0.16	-0.01	-0.13	-0.46	-0.07	-0.02	-0.12	-0.03	-0.01	-0.20	-0.34	-0.16	-0.19	-0.10	-0.07
F	-0.04	0.47*	1.29*	0.67**	-0.28	2.16***	-0.68	-0.24	0.97	-0.80*	1.52***	1.72***	-0.96	1.92**	0.15	-1.60***
	-0.34	-0.27	-0.75	-0.31	-0.76	-0.71	-0.73	-0.17	-1.96	-0.43	-0.48	-0.58	-0.77	-0.87	-0.29	-0.41
F_{t-1}	0.41*	0.19	-0.55	0.10	0.46	-0.29	0.67	-0.34***	0.42	0.50	-0.72	0.08	0.40	-0.33	0.15	1.15***
	-0.25	-0.18	-0.85	-0.24	-0.82	-0.41	-0.67	-0.13	-1.90	-0.38	-0.55	-0.35	-0.54	-0.35	-0.15	-0.40
F_{t-2}	-0.12	-0.17	-0.55	0.03	0.42	0.87***	-0.62	-0.20*	-1.97**	0.64***	0.37	0.27	-0.31	-1.08***	0.34**	0.26
	-0.22	-0.15	-0.56	-0.21	-0.37	-0.33	-0.53	-0.11	-0.92	-0.25	-0.42	-0.32	-0.27	-0.42	-0.15	-0.30
I_{t-2}	0.33***	0.35***	0.95***	-0.14	0.67***	0.29**	0.98***	0.12	0.46***	0.02	0.47***	0.49***	0.26*	0.71***	0.85***	0.51***
	-0.10	-0.10	-0.16	-0.15	-0.13	-0.14	-0.16	-0.11	-0.08	-0.09	-0.09	-0.13	-0.15	-0.12	-0.06	-0.07
R -Sq	0.69	0.77	0.67	0.48	0.38	0.66	0.91	0.61	0.66	0.57	0.82	0.51	0.54	0.63	0.88	0.91
Adjusted R -sq	0.59	0.70	0.55	0.30	0.18	0.55	0.88	0.49	0.55	0.43	0.76	0.36	0.39	0.51	0.85	0.88
SE of regression	2.24	2.12	3.58	2.21	4.40	2.31	1.42	1.79	2.42	1.50	3.82	2.85	3.10	2.24	1.59	2.35

Table 3. Immediate vs. long term effect of FDI- 3SLS.

	ARG	CHL	CHN	COL	EGY	IDS	IND	ISR	KOR	MEX	MLY	MOR	PER	PHL	SA	THL
Immediate Effect	-0.04	0.47*	1.29*	0.67**	-0.28	2.16***	-0.68	-0.24	0.97	-0.80*	1.52***	1.72***	-0.96	1.92**	0.15	1.60***
Long term effect	0.36	0.75	4.09	0.92	1.80	3.87	-29.32	-0.88	-1.07	0.35	2.23	4.04	-1.18	1.76	4.35	-0.39

Table 4. Long-term effect of FDI on DI.

ARG	CHL	CHN	COL	EGY	IDS	IND	ISR	KOR	MEX	MLY	MOR	PER	PHL	SA	THL
N	N	N	N	N	N	N	CO	N	CO	N	CI	CO	N	N	N

According to the obtained results, FDI is not neutral in few countries where specific country characteristics give rise to those exceptions. For example, if one takes the case of Israel, which shows a clear case of CO, one can argue that Israel is almost a developed country with one of the highest research and development (R&D) expenditure per capita in the world. Hence, it is difficult to envisage that Israel awaits MNCs to explore its investment opportunities. But more likely, foreign investors when entering Israeli market, they compete with local ones leading to a situation of CO. This result is consistent with [5] which found that the effect of FDI on DI tends to be weaker in case of developed as opposed to developing countries.

The situation is completely reversed in Morocco since Morocco is an emerging market with lots of investment opportunities that can be explored by local and foreign investors. In addition, there was a decree in Morocco (*Marocconization Decree*) which was issued in 1973 but eliminated in December 1989 which put a cap of 49% on foreign ownership in all sectors. Even after the elimination of this decree, there were limits on foreign participation in a number of sectors outside manufacturing [32]. This enacted policy had the effect of limiting to a great extent the incidents of CO and emphasizing the complementarity of DI and FDI.

5. Conclusions

This paper addresses the important question of whether FDI crowds in or out of DI. Despite the fact that this is not a new question as a number of studies have tried to address the same question. Nevertheless, stemming from the premise that there are many country specific factors affecting how FDI influences DI, the answer of this question should be addressed empirically without imposing equality restrictions on the effect of FDI on investment as most studies do using panel data models. Such restrictions lead to aggregation bias which might explain why previous results have obtained ambiguous results.

Using a simple partial adjustment model for capital with foreign and domestic investment, an empirical model is derived relating total investment to FDI along with a number of other determinants of investment. This empirical model was then estimated using a sample of 16 emerging economies for the period 1978-2010. To avoid this aggregation bias, this model was estimated using 2SLS. This estimation procedure not only addresses the aggregation bias but also accounts for the endogeneity of FDI. To account also for the possibility that errors across country equations are correlated and heteroskedastic given that emerging economies are subject to common international capital market shocks, the model is estimated using 3SLS which has produced better results.

Estimation results have shown that the effect of FDI on DI is country specific. In terms of direction, in most countries, on impact, FDI has a positive and significant effect on DI. In subsequent periods, FDI may crowd out DI in some countries. Taking the total or the long-term effect of FDI on DI, there is evidence that in most of the countries included in the sample, FDI has a neutral effect on DI where there is a one-to-one relationship between FDI and total investment. Crowding in or crowding out effect of FDI on DI is only found in few countries. This indicates that the rule is the neutrality of FDI on DI and the exception is otherwise (whether crowding in or out).

Acknowledgements

The author wants to thank Mohammed Bouaddi for constructive comments and suggestions and Ronia Hawash and Loujaina El-Said excellent research assistance.

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