The causality relationship between financial development and foreign direct investment

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Abstract

Although the role of FDI on economic growth has been studied extensively, there is no systematic study carried out to examine the causal relationship between FDI and the level of financial development. Therefore, this paper investigates this issue by examining the causal relationship between FDI and financial development in 37 developing countries in a multivariate framework. The findings from causality tests provide little support for the hypothesis that the inflows of FDI can contribute to the development of the domestic banking sector in developing countries. This study also finds that FDI has no effect on the development of the domestic banking sector. There is also little support for the argument that the development of the domestic banking sector causes FDI. In contrast, the author finds strong support that FDI can affect the development of the domestic stock markets in the developing countries, and vice versa.

Keywords: *Financial Development, Economic growth, Foreign Direct Investment, Causality, developing countries*

Introduction

Many policy makers in the developing countries believe that Foreign Direct Investment (FDI) has several positive effects especially on economic growth. These include productivity gains, technology transfers and the introduction of new processes, managerial skills and expertise, employee training, international production networks, and access to international markets. Empirical studies show that the effect of FDI on growth depends on the absorptive capability of the host country, which includes the initial level of development (Blomstrom *et al.* 1992), the level of human capital development (Borensztein *et al.* 1998), and trade policy (Balasubramanyam *et al.* 1996). Recent empirical studies have found that the level of development of the domestic financial system could also partly determine the positive effects of FDI on economic growth (Hermes and Lensink, 2000; Alfaro *et al.* 2004). If having a minimum threshold level of financial development is a pre-requisite for the positive impact of FDI on growth, it is legitimate to ask whether FDI itself could contribute to financial development, and hence enhancing its chances for stimulating growth.

Although the role of FDI on economic growth has been studied extensively, no systematic study has been carried out to examine the causal relationship between FDI and the level of financial development. Therefore, this paper investigates this issue by examining the causal relationship between FDI and financial development. The development of the financial markets in this study is categorised into two sectors; credit markets and equity markets, and the causality tests were carried out in the framework of a multivariate model. The causality tests were carried out for 37 developing countries. With a different history of macroeconomic

episodes, policy regimes and the level of development of the financial system among countries in the sample, this study is expected to provide more information on the nature of the causal relationship between financial development and FDI.

Literature review

The effects of FDI on economic growth depend on the absorptive capacity of host countries and these include among others, the development of the domestic financial system. There are different ways in which financial markets matter. First, without external financing, the spillovers of FDI may be limited to only costless improvements in the organisation. Generally, to take advantage of the new technologies and/or knowledge, local firms need to alter their everyday activities, and these required them to buy new machines, hire new managers and skilled workers. Although some local firms might be able to finance these new requirements internally, the greater the technological-knowledge gaps between their current practices and new technologies, the greater the need for external finance. Thus, the development of the domestic financial system will determine to what extent domestic firms may be able to realise their investment plans in case external finance is needed.

Second, the development of the financial system also influences the allocative efficiency of financial resources over investment projects. Moreover, investment related to upgrade of existing or adoption of new technologies is more risky than other investment projects. The financial institutions may help to reduce these risks, thereby stimulating domestic entrepreneurs to undertake the upgrading of existing technology or to adopt new technologies introduced by foreign firms. Thus, financial institutions positively affect the speed of technological innovation, thereby enhancing economic growth (Huang and Xu, 1999). The more developed the domestic financial system, the better it will be able to reduce risks associated with investment in upgrading old and new technologies.

Finally, the development of the domestic financial system may also determine to what extent foreign firms will be able to borrow in order to extend their innovative activities in the host country, which would further increase the scope for technological spillovers to domestic firms. FDI as measured by the financial flow data may be only part of the FDI to developing countries, as some of the investment is financed through debt and/or equity raised in financial markets in the host countries (Borensztein *et al.* 1998). Thus, the availability and quality of domestic financial markets also may influence FDI and its impact on the diffusion of technology in the host country. This diffusion process may be more efficient once financial markets in the host country are better developed, since this allows the subsidiary of a MNC to expand their investment once it has entered the country. Therefore, FDI and domestic financial institutions are complementary with respect to enhancing the process of technological diffusion, thereby increasing the rate of economic growth.

Existing studies, in general, show that the development of financial markets played a significant role in enhancing the positive effects of FDI on economic growth. Alfaro *et al.* (2004), for example, has examined the various links among FDI, financial markets, and economic growth using cross-country data from 1975-1985. They investigated whether countries with better financial systems can exploit FDI more efficiently. The indicators of financial development in the study cover both the banking sector (credit market) and the stock market (equity market). The data set related to the 'credit market indicators' includes 20 OECD countries and 51 non-OECD countries, while the data set on 'equity market indicators' consists of 20 OECD countries and 29 non-OECD countries. Their findings show that FDI

plays an important role in contributing to economic growth. However, the level of development of local financial markets is crucial for these effects to be realised.

Similar results also can be found in the panel data study by Hermes and Lensink (2000). The data set used in Hermes and Lensink is for the 1970-1995 period and contains 67 developing countries. The indicators of financial development used however, only focused on the banking sector development which is the ratio of credit to the private sector as a percentage of GDP. Their results strongly suggest that the development of the financial system enhanced the positive relationship between FDI and economic growth. Specifically, they found that, of the 67 countries in the data set, 37 have a sufficiently developed financial system that enabled. FDI to contribute positively to economic growth. Most of these countries are in Latin America and Asia. Most countries in Sub-Saharan African have very weak financial systems, and consequently FDI does not contribute positively to growth in these countries.

Bailliu (2000) focused on the effects of a broad measure of capital flows on economic growth, rather than on a more specific category, such as FDI. The study finds that the domestic financial sector played a significant role in the process linking capital flows and growth. The study used panel data for 40 developing countries from 1975-1995, and the level of banking sector development is proxied by the ratio of domestic assets held by commercial banks to the total held by both commercial banks and the central bank. The paper finds that capital inflows foster economic growth, but only for countries where the banking sector has reached a certain level of development. For countries with poorly developed banking sectors, the effect of capital flows on growth is found to be negative. He argued that the result could be caused by a correlation between a low level of financial sector development and government-imposed distortions in the financial sectors of the sample countries.

Although the role of the financial system in enhancing the positive effects of FDI on growth has been recognised and empirically investigated, the question still arises with respect to the relation between FDI and financial market development, mainly due to the lack of empirical studies on the causal relationship between these two variables. In general, there are two views regarding the relationship between FDI and financial development. First, FDI can contribute to the development of domestic financial markets especially the stock market. According to this view, FDI can fuel the development of the stock market through different channels. FDI can be positively related to the participation of foreign firms in capital markets, since foreign investors might want to finance part of their investment with external capital or might want to recover their investment by selling equity in capital markets.

Alternatively, if the foreign investments are partly invested through purchasing existing equity, the liquidity of the domestic stock markets might increase. Under this view, FDI can be a complement to stock market development, and should be positively correlated with the development of domestic equity markets. Claessens *et al.* (2001), using a sample of 77 countries showed that FDI is positively correlated with stock market capitalisation and value traded. They concluded that FDI is a complement and not a substitute for domestic stock market development. However, there is the view that FDI tends to be larger in countries that are riskier, financially underdeveloped, and institutionally weak. From this perspective, FDI is a substitute for stock market development. FDI takes place to overcome the difficulties of investing through capital markets, given that shareholders rights are not protected. According to this view, FDI should be negatively correlated with the development of stock markets. This view has been expressed, among others, by Hausmann and Fernandez-Arias (2000).

Many believe that FDI is associated with the inflow of funds into domestic financial markets and could help to ease credit constraints that are faced by local firms in the developing countries. They argue that credit constraints is a major obstacle for the domestic firms in the developing countries to invest in the potentially profitable projects, hence limit the capability of the firms to absorb new technologies. In this regard, FDI may help to reduce credit constraints faced by local firms by bringing in scarce capital to the host countries. Recent studies show that domestically owned firms in the developing countries are much more likely to face credit constraints than multinational firms. For example, a study by Harrison and McMillan (2003) using firm data from the Ivory Coast finds that domestic firms are more credit constrained than foreign firms.

However, if foreign firms borrow heavily from domestic financial institutions, they may exacerbate domestic firms' financing constraints by crowding them out of domestic capital markets. Foreign investors may borrow from domestic capital markets for a variety of reasons, including hedging against exchange rate fluctuations or in response to artificially low domestic interest rates. One of the possible avenues for crowding out could be attributed to the fact that foreign firms may simply be more profitable and/or have access to more collateral and thus be a better investment for lending institutions. It also may be because lending to local enterprises is more costly because they were generally considered more risky. The problem could be compounded by the fact that interest rates in some developing countries were fixed, thus creating excess demand for loans and the likelihood of credit rationing. Because of interest rate ceilings, banks could not compensate for the extra cost of lending to domestic firms and hence preferred to lend to foreign firms. Alternatively, it could be that foreign firms had better relationships with bankers for any of a variety of reasons. This competitive pressure may discourage local firms from investing in new technologies due to the increase in the costs of external financing, and hence limit the effects of FDI on economic growth.

Methodology

Granger Causality

In order to test the causality issue empirically, it is common to apply the Granger causality test that was initially introduced by Granger (1969). In a bivariate framework, the variable y_{1t} is said to cause the variable y_{2t} in the Granger sense if the forecast for y_{2t} improves when lagged variables y_{1t} are taken into account in the equation. In general, conventional Granger causality can be represented by the following bivariate system:

$$y_{1t} = \delta_1 + \sum_{i=1}^{m} \beta_i y_{1t-i} + \sum_{i=1}^{n} \alpha_i y_{2t-i} + \varepsilon_{1t} \tag{1}$$

$$y_{2t} = \delta_2 + \sum_{i=1}^{q} \pi_i y_{1t-i} + \sum_{i=1}^{r} \phi_i y_{2t-i} + v_t \tag{2}$$

where, δ_1 and δ_2 are drifts. The coefficient α_is are relevant for testing Granger causality running from y_{2t} to y_{1t} while the coefficient π_is are appropriate for Granger causality test running in the opposite direction. Four findings are possible in a Granger causality test. First, neither variable Granger causes the other. In other words, independence is suggested when the set of y_{1t} and y_{2t} coefficients are not statistically significant in both regressions. Second, unidirectional causality from y_{2t} to y_{1t}, which means y_{2t} causes y_{1t} but not vice versa. Third, unidirectional causality from y_{1t} to y_{2t} that means y_{1t} causes y_{2t} but not vice versa. Fourth,

bilateral causality between two variables, which means y_{1t} and y_{2t} Granger cause each other (feedback effect). According to the above equations, the null hypothesis that y_{2t} does not Granger cause y_{1t} is rejected if the coefficients of α_is in equation (1) are jointly significant. The null hypothesis that y_{1t} does not Granger cause y_{2t} is rejected if the π_is are jointly significant in equation (2). If in both equations some $\alpha_i \neq 0$ and some $\pi_i \neq 0$ then there is feedback between y_{1t} and y_{2t}. Usually, the standard F-test is used to determine the joint significance and hence the causal relationship between variables.

The studies applying the standard causality tests, however, suffer from two methodological deficiencies. First, the standard tests do not examine the basic time series properties of the variables. The standard Granger causality test assumes stationarity of the time series being examined. Therefore, if variables are nonstationary, the implications drawn from the test are invalid. Many studies have shown that models with nonstationary variables tend to produce spurious regressions and make the usual test statistics (e.g. F-test) unreliable (Granger and Newbold, 1974; Stock and Watson, 1989). To solve this problem, many empirical studies have turned the series stationary mechanically by differencing the variables. This process, however, will eliminate the long-run information embodied in the original levels form of the variables. Second, standard Granger tests are only valid if the original time series are not cointegrated. If the variables are cointegrated, a model incorporating differenced variables will be misspecified (Granger, 1986).

In this regard, the technique pioneered by Engle and Granger (1987) makes a significant contribution towards testing causality. Engle and Granger demonstrate that once a number of variables are cointegrated there always exists a corresponding error-correction representation. This implies that changes in the dependent variable are a function of the levels of disequilibrium in the cointegration relationship that is captured by the error-correction term, as well as changes in other explanatory variables. A consequence of cointegration is that either Δy_{1t} or Δy_{2t} or both must be caused by the lagged error-correction term which itself is a function of y_{1t-I}, y_{2t-1}. In general, the relationship between y_{1t} and y_{2t} can be written in vector-error correction model (VECM) form as:

$$\Delta y_{1t} = \delta_1 + \sum_{i=1}^{m} \gamma_{1i} \Delta y_{1t-i} + \sum_{i=1}^{n} \beta_{1i} \Delta y_{2t-i} + \sum_{i=1}^{r} \alpha_{1i} ECM_{r,t-1} + \mu_{1t} \tag{3}$$

$$\Delta y_{2t} = \delta_1 + \sum_{i=1}^{m} \gamma_{2i} \Delta y_{1t-i} + \sum_{i=1}^{n} \beta_{2i} \Delta y_{2t-i} + \sum_{i=1}^{r} \alpha_{2i} ECM_{r,t-1} + \mu_{2t} \tag{4}$$

where, Δ denotes the first-difference of a non-stationary variable. In the VECM, the sources of causation can be exposed through the statistical significance of three different tests. First, from a joint test that is applied to the sum of the lags of each explanatory variable. Second, by a t-test on the lagged ECM term, that is the weak exogeneity test. Thirdly, by a joint test that is applied to the sum of each explanatory variable and the lagged ECM terms (the strong exogeneity test). For instance, the null hypothesis that y_{2t} does not Granger cause y_{1t} is rejected if the β_{1i}s are jointly significantly different from zero. The same null hypothesis is also rejected if α_{1i} is significant or if β_{1i}s and α_{1i} are jointly significant from zero.

Model and Data

This study uses Granger-causality tests to examine the direction of causal relationships between FDI and financial development indicators (FS). The causality testing will be

conducted to test causalities from one variable (FDI) to one variable (financial development indicators), and vice versa. The vector of endogenous variables of the VECM used in estimation is as follow:

$$V' = [FDI_t \ G_t \ FS_t \ C_t] \tag{5}$$

where C_t is the control variable. The control variable used in this study is the openness of the economy which is measured by the sum of exports and imports divided by GDP. The econometric methodology will first examine the stationarity properties of the time series. For this purpose, two unit root tests will be used; the Augmented Dickey Fuller (ADF) and the Phillips-Perron (PP) tests. The second stage involves investigating bivariate cointegration utilizing the Johansen maximum likelihood approach. If bivariate cointegration exists then either unidirectional or bi-directional Granger-causality must also exist. The third stage involves constructing the standard Granger-causality tests. In all tests and regressions, the lag length is determined by using Akaike Information Criteria (AIC), and estimation is carried out using statistical software SAS.

In this study, causality tests will be carried out on individual countries. Study of individual countries will give more information about the causality relationship between FDI and financial development. The sample in this study consists of 37 developing countries and covers the period from 1970 to 1999 (see Appendix 1). However, in the case of stock markets, the restricted availability of the data limits the sample to 13 countries and the length of period to 1975-1999. The main source of data is the World Development Indicators (WDI, 2001) of the World Bank; the data for stock market development indicators are taken from the Beck *et al.* (2000) database.

The data for FDI is measured by net inflows of foreign direct investment into the country. The use of net FDI seems more appropriate for examining the effects of foreign direct investment on the host country. In this study, FDI is measured as a ratio to, the indicators for the financial sector development used in this study can be classified into two broad categories: those related to the banking sector (or credit market) and those related to the stock market (or equity market). For the credit market, the indicators that were introduced by Levine *et al.* (2000), which in turn were based on King and Levine (1993) will be used. The indicators are, first, liquid liabilities of the financial system (henceforth, B1), which is currency plus demand deposits and interest-bearing liabilities of banks and non-financial intermediaries divided by GDP. B1 provides a measure for the overall size of the financial sector. The second indicator is the value of credit by financial intermediaries to the private sector divided by GDP (henceforth, B2). This indicator has been widely used in the recent empirical studies of financial development and economic growth. This indicator seems appropriate, as FDI may have an effect on the availability of credit in the host country. For the equity market, two indicators of stock market development introduced by Levine and Zervos (1998) will be used. The first indicator is the average value of listed domestic shares on domestic exchanges as a share of the size of the GDP. This variable captures the relative size of the stock markets, and represents as 'market capitalisation' (henceforth, S1). The second indicator is the value of stock traded relative to the size of the economy, labeled as 'value traded' (henceforth, S2). The indicator measures the stock market liquidity. The growth rate of output is measured as the growth of real per capita GDP in constant dollars.

Results from Unit Root Test & Test For Cointegration

The results of unit root tests in Appendix 2 show that FDI is stationary at levels for 19 countries. However, for 18 for countries, FDI is stationary in first differences. The unit root tests on banking development indicators and stock market development indicators generally find that these variables are not stationary at levels. Specifically, for B1, unit root tests indicate that the variables are stationary at levels only in the case of Brazil, Congo Republic, Guatemala, and India, while in the other countries, this variable is stationary in first differences. For B2, unit root tests find that only for Argentina, Brazil, Congo Republic, Jamaica, Kenya and Philippines are the variables stationary at levels, while for 23 other countries, B2 is stationary at first differences, and in 7 countries B2 is stationary at second differences. These findings suggest that, in most of the cases, the variable B2 is I(1). The countries for which variable B2 I (2) were Honduras, Indonesia, Pakistan, Panama, South Africa, Sri Lanka and Thailand.

This study also finds that stock market development indicators for most of the countries are stationary at first differences, indicating that, in general, S1 and S2 are I(1). Specifically, the unit root tests show that S1 is stationary at levels for Chile, but stationary at first differences for Malaysia, Nigeria, Philippines, and Thailand, and stationary at second differences in the case of Colombia, Mexico, and Thailand. In most of the cases, is stationary at first differences. In the case of India, Nigeria, Peru and South Africa, S2 is stationary at second differences, suggesting that S2 in these countries is I(2).

Results from Cointegration Tests

The cointegration tests are performed using Johansen (1988) tests, and the results from this test are presented in Appendix 3. The test for cointegration shows that FDI is cointegrated with B1 in 22 countries, and with B2 in 18 countries out of the 37 countries in our sample. The results also indicate that FDI is cointegrated with both B1 and B2 in 16 cases. For six countries, FDI is only cointegrated with B1, while for Mauritius and Peru, FDI is only cointegrated with B2. In the case of stock market development indicators, the results show that S1 is cointegrated with FDI for 5 out of 8 countries being studied, while S2 is cointegrated with FDI for 8 out of 13 countries in the sample. FDI is cointegrated with both S1 and S2 in 4 cases. For Mexico only S1 is cointegrated with FDI, while the case of Nigeria only S2 is cointegrated with FDI.   However, both stock market indicators are not cointegrated with FDI in the case of Chile and the Philippines.

In summary, the results from cointegration tests show that variable FDI and banking development indicators (B1 and B2) are cointegrated in about half of the cases being studied. In most of the cases, both stock market development indicators (S1 and S2) and FDI are cointegrated.

Causality between FDI and Banking Sector Development

The causality tests are conducted by testing, first, the direction of causality between FDI and the financial development indicators in a bivariate VECM framework. This is followed by the causality tests in the multivariate VECM framework where economic growth and a control variable (trade openness) are included in the model in addition to FDI and the banking development indicators. From column 3 of Table 1, the results show that FDI and B1 are not causally related in 18 out of 37 countries being studied, while in 4 countries the direction of causality is bi-directional, and in 15 countries the causality is unidirectional. The countries for

which the direction of causality between FDI and B1 is bi-directional were Barbados, Morocco, Pakistan, and Paraguay. Moreover, out of the 15 countries where unidirectional causality between FDI and B1 is significant, in 6 countries the direction of causality runs from FDI to B1, while in 9 countries the causality runs in the opposite direction. With regard to the causal relationship between FDI and B2, this study finds that these two variables are not causally related in 20 out of 37 countries being studied. In 5 countries, the causality is from FDI to B2, while in 7 countries, the direction of causality is from B2 to FDI, and not vice versa. Bi-directional causality between these two variables is significant in 5 countries, namely Barbados, Central Africa, Nigeria, Pakistan, and Thailand.

The findings of causality tests from the multivariate VECM (refer to column 4 of Table 1) are consistent with the findings from the bivariate model. However, in some cases, results from the multivariate VECM are slightly different from the bivariate VECM model. For example, in Barbados, causality test based on bivariate VECM shows the direction of causality between FDI and B1, and FDI and B2, both are bi-directional, but in the multivariate VECM, only the causality that runs from FDI to B2 is significant. In the case of Central Africa, Jamaica, Pakistan, and Panama, causality tests based on the multivariate VECM does not support the findings from bivariate VECM that FDI causes B1. Findings from multivariate VECM also does not support findings from the bivariate VECM that FDI causes B2 in the case of Central Africa, Costa Rica, and Pakistan. Differences also can be observed in the case of causality between FDI and B2 especially for Barbados, Central Africa, Costa Rica, Honduras, Mauritania, and Pakistan.

Table 1: Causality Tests between FDI and Banking Sector Development

Country	Null hypothesis	Wald Statistics	
		Bivariate	Multivariate
(1)	(2)	(3)	(4)
Algeria	FDI does not Granger-cause B1	3.58(0.4660)	0.59(0.7443)
	B1 does not Granger-cause FDI	1.86(0.7615)	1.65(0.4391)
	FDI does not Granger-cause B2	1.96(0.7428)	0.30(0.8618)
	B2 does not Granger-cause FDI	2.78(0.5953)	3.83(0.1473)
Argentina	FDI does not Granger-cause B1	0.71(0.3989)	0.71(0.3989)
	B1 does not Granger-cause FDI	0.63(0.4280)	0.63(0.4280)
	FDI does not Granger-cause B2	1.33(0.2490)	1.33(0.2490)
	B2 does not Granger-cause FDI	0.09(0.7656)	0.09(0.7656)
Barbados	FDI does not Granger-cause B1	9.93(0.0771)**	0.95(0.3310)
	B1 does not Granger-cause FDI	13.65(0.0180)*	0.77(0.3811)
	FDI does not Granger-cause B2	10.84(0.0546)**	17.86(0.0001)*
	B2 does not Granger-cause FDI	49.22(0.0001)*	2.86(0.2388)
Bolivia	FDI does not Granger-cause B1	1.07(0.3002)	5.43(0.2461)
	B1 does not Granger-cause FDI	0.17(0.6772)	11.13(0.0251)*
	FDI does not Granger-cause B2	0.21(0.6470)	6.09(0.1924)
	B2 does not Granger-cause FDI	0.02(0.8998)	4.81(0.3078)
Brazil	FDI does not Granger-cause B1	5.73(0.2199)	5.73(0.2199)
	B1 does not Granger-cause FDI	18.87(0.0008)*	18.87(0.0008)*
	FDI does not Granger-cause B2	4.56(0.3358)	4.56(0.3358)
	B2 does not Granger-cause FDI	14.38(0.0062)*	14.38(0.0062)*

Table 1 (continued)

Central Africa	FDI does not Granger-cause B1	19.39(0.0007)*	0.51(0.4742)
	B1 does not Granger-cause FDI	2.73(0.6046)	0.13(0.7169)
	FDI does not Granger-cause B2	22.31(0.0005)*	0.33(0.5656)
	B2 does not Granger-cause FDI	34.25(0.0001)*	4.49(0.0341)*
Chile	FDI does not Granger-cause B1	0.04(0.8339)	2.56(0.6336)
	B1 does not Granger-cause FDI	0.12(0.7284)	1.98(0.7395)
	FDI does not Granger-cause B2	3.08(0.5442)	3.08(0.5442)
	B2 does not Granger-cause FDI	1.54(0.8191)	1.54(0.8191)
Colombia	FDI does not Granger-cause B1	16.00(0.0030)*	16.00(0.0030)*
	B1 does not Granger-cause FDI	7.68(0.1040)	7.68(0.1040)
	FDI does not Granger-cause B2	16.16(0.0028)*	16.16(0.0028)*
	B2 does not Granger-cause FDI	7.49(0.1121)	7.49(0.1121)
Congo Republic	FDI does not Granger-cause B1	4.64(0.4610)	4.08(0.3949)
	B1 does not Granger-cause FDI	11.25(0.0467)*	5.00(0.2870)
	FDI does not Granger-cause B2	0.36(0.9857)	0.36(0.9858)
	B2 does not Granger-cause FDI	0.13(0.9981)	0.31(0.9981)
Costa Rica	FDI does not Granger-cause B1	0.28(0.6786)	1.46(0.2267)
	B1 does not Granger-cause FDI	11.94(0.0026)*	0.16(0.6854)
	FDI does not Granger-cause B2	13.49(0.0012)*	1.03(0.3105)
	B2 does not Granger-cause FDI	2.65(0.2655)	2.56(0.1097)
El Salvador	FDI does not Granger-cause B1	0.35(0.5550)	0.35(0.5554)
	B1 does not Granger-cause FDI	0.09(0.7704)	0.09(0.7704)
	FDI does not Granger-cause B2	0.04(0.7596)	0.09(0.7595)
	B2 does not Granger-cause FDI	0.64(0.4255)	0.64(0.4255)
Ghana	FDI does not Granger-cause B1	0.76(0.9443)	0.76(0.9443)
	B1 does not Granger-cause FDI	4.92(0.2957)	4.92(0.2957)
	FDI does not Granger-cause B2	0.01(0.9970)	0.53(0.4683)
	B2 does not Granger-cause FDI	2.87(0.2381)	0.33(0.5673)
Guatemala	FDI does not Granger-cause B1	6.30(0.0429)*	8.10(0.0881)**
	B1 does not Granger-cause FDI	2.85(0.2409)	13.55(0.0089)*
	FDI does not Granger-cause B2	5.09(0.2779)	5.09(0.2779)
	B2 does not Granger-cause FDI	21.82(0.0002)*	21.82(0.0002)*
Honduras	FDI does not Granger-cause B1	2.15(0.7075)	2.15(0.7075)
	B1 does not Granger-cause FDI	14.39(0.0062)*	14.39(0.0067)*
	FDI does not Granger-cause B2	0.00(0.9891)	0.77(0.9425)
	B2 does not Granger-cause FDI	0.44(0.5060)	9.14(0.0577)**
India	FDI does not Granger-cause B1	0.87(0.9282)	0.87(0.9282)
	B1 does not Granger-cause FDI	7.61(0.1070)	7.61(0.1070)
	FDI does not Granger-cause B2	7.67(0.1043)	7.67(0.1043)
	B2 does not Granger-cause FDI	7.00(0.1361)	7.00(0.1361)
Indonesia	FDI does not Granger-cause B1	4.21(0.3782)	4.21(0.3782)
	B1 does not Granger-cause FDI	0.37(0.9852)	0.37(0.9852)
	FDI does not Granger-cause B2	18.47(0.0004)*	12.91(0.0003)*
	B2 does not Granger-cause FDI	2.02(0.5691)	0.17(0.6801)
Israel	FDI does not Granger-cause B1	1.88(0.7575)	1.88(0.7575)
	B1 does not Granger-cause FDI	3.06(0.5485)	3.06(0.5485)
	FDI does not Granger-cause B2	2.96(0.5650)	2.96(0.5650)
	B2 does not Granger-cause FDI	1.66(0.7978)	1.66(0.7978)

Table 1 (continued)

Jamaica	FDI does not Granger-cause B1	9.06(0.0595)**	2.47(0.1158)
	B1 does not Granger-cause FDI	6.29(0.1784)	0.25(0.6182)
	FDI does not Granger-cause B2	0.66(0.7177)	0.66(0.7177)
	B2 does not Granger-cause FDI	5.06(0.0796)**	5.06(0.0796)**
Kenya	FDI does not Granger-cause B1	6.68(0.1539)	0.00(0.9502)
	B1 does not Granger-cause FDI	6.87(0.1431)	0.05(0.8233)
	FDI does not Granger-cause B2	1.36(0.8517)	0.03(0.8657)
	B2 does not Granger-cause FDI	4.55(0.3368)	0.19(0.6612)
Malaysia	FDI does not Granger-cause B1	3.72(0.4445)	3.72(0.4445)
	B1 does not Granger-cause FDI	13.14(0.0106)*	13.14(0.0106)*
	FDI does not Granger-cause B2	5.33(0.2548)	5.33(0.2548)
	B2 does not Granger-cause FDI	23.25(0.0001)*	23.25(0.0001)*
Mauritania	FDI does not Granger-cause B1	47.50(0.0001)	1.12(0.2910)
	B1 does not Granger-cause FDI	1.12(0.8918)	0.46(0.4971)
	FDI does not Granger-cause B2	0.26(0.9921)	0.01(0.9070)
	B2 does not Granger-cause FDI	9.86(0.0428)*	1.35(0.2456)
Mauritius	FDI does not Granger-cause B1	0.30(0.9901)	0.30(0.9901)
	B1 does not Granger-cause FDI	4.31(0.3662)	4.31(0.3662)
	FDI does not Granger-cause B2	2.70(0.6100)	2.70(0.6100)
	B2 does not Granger-cause FDI	4.53(0.3389)	4.53(0.3389)
Mexico	FDI does not Granger-cause B1	7.52(0.1108)	7.52(0.1108)
	B1 does not Granger-cause FDI	3.18(0.5284)	3.18(0.5284)
	FDI does not Granger-cause B2	9.29(0.0543)**	9.29(0.0543)**
	B2 does not Granger-cause FDI	3.55(0.4702)	3.55(0.4702)
Morocco	FDI does not Granger-cause B1	7.80(0.0052)*	7.80(0.0052)*
	B1 does not Granger-cause FDI	4.57(0.0325)*	4.57(0.0325)*
	FDI does not Granger-cause B2	3.22(0.5219)	2.22(0.1361)
	B2 does not Granger-cause FDI	2.96(0.5640)	0.91(0.3389)
Nigeria	FDI does not Granger-cause B1	4.59(0.3321)	4.59(0.3321)
	B1 does not Granger-cause FDI	6.40(0.1711)	6.40(0.1711)
	FDI does not Granger-cause B2	11.82(0.0188)*	11.82(0.0188)*
	B2 does not Granger-cause FDI	26.00(0.0001)*	26.00(0.0001)*
Pakistan	FDI does not Granger-cause B1	21.65(0.0002)*	2.14(0.3436)
	B1 does not Granger-cause FDI	18.46(0.0010)*	9.24(0.0098)*
	FDI does not Granger-cause B2	14.72(0.0053)*	0.15(0.9291)
	B2 does not Granger-cause FDI	13.09(0.0108)*	8.60(0.0136)*
Panama	FDI does not Granger-cause B1	2.52(0.06409)**	2.52(0.6409)
	B1 does not Granger-cause FDI	0.79(0.9404)	0.79(0.9404)
	FDI does not Granger-cause B2	14.33(0.0008)*	40.70(0.0001)*
	B2 does not Granger-cause FDI	2.85(0.2411)	1.74(0.7838)
Paraguay	FDI does not Granger-cause B1	8.90(0.0637)**	8.90(0.0637)**
	B1 does not Granger-cause FDI	9.73(0.0453)*	9.73(0.0453)*
	FDI does not Granger-cause B2	4.03(0.4019)	4.03(0.4019)
	B2 does not Granger-cause FDI	12.43(0.0144)*	12.43(0.0144)*
Peru	FDI does not Granger-cause B1	3.06(0.5472)	3.06(0.5472)
	B1 does not Granger-cause FDI	6.04(0.1964)	6.04(0.1964)
	FDI does not Granger-cause B2	3.68(0.4510)	3.68(0.4510)
	B2 does not Granger-cause FDI	1.64(0.8020)	1.64(0.8020)

Table 1 (continued)

Philippines	FDI does not Granger-cause B1	3.16(0.5318)	3.16(0.5318)
	B1 does not Granger-cause FDI	10.45(0.0334)*	10.45(0.0334)*
	FDI does not Granger-cause B2	0.26(0.6120)	0.26(0.6120)
	B2 does not Granger-cause FDI	0.78(0.3769)	0.78(0.3769)
Singapore	FDI does not Granger-cause B1	0.69(0.9521)	0.69(0.9521)
	B1 does not Granger-cause FDI	5.16(0.2714)	5.16(0.2714)
	FDI does not Granger-cause B2	6.89(0.1419)	6.89(0.1419)
	B2 does not Granger-cause FDI	2.93(0.3704)	2.93(0.5704)
South Africa	FDI does not Granger-cause B1	7.05(0.0079)*	16.90(0.0020)*
	B1 does not Granger-cause FDI	1.79(0.1805)	11.62(0.0204)
	FDI does not Granger-cause B2	0.00(0.9915)	0.37(0.9284)
	B2 does not Granger-cause FDI	0.00(0.9655)	2.20(0.6999)
Sri Lanka	FDI does not Granger-cause B1	6.99(0.1366)	6.99(0.1366)
	B1 does not Granger-cause FDI	3.74(0.4423)	3.74(0.4423)
	FDI does not Granger-cause B2	0.96(0.9157)	0.96(0.9157)
	B2 does not Granger-cause FDI	3.10(0.5405)	3.10(0.5404)
Thailand	FDI does not Granger-cause B1	4.39(0.3563)	0.05(0.8151)
	B1 does not Granger-cause FDI	22.40(0.0002)*	3.45(0.0632)
	FDI does not Granger-cause B2	22.02(0.0001)*	22.02(0.0001)*
	B2 does not Granger-cause FDI	7.14(0.0076)*	7.14(0.0076)*
Tunisia	FDI does not Granger-cause B1	0.12(0.7322)	0.12(0.7322)
	B1 does not Granger-cause FDI	2.90(0.0884)**	2.90(0.0884)**
	FDI does not Granger-cause B2	4.24(0.3745)	4.24(0.3745)
	B2 does not Granger-cause FDI	2.61(0.6252)	2.61(0.6252)
Venezuela	FDI does not Granger-cause B1	0.95(0.3291)	0.95(0.3291)
	B1 does not Granger-cause FDI	4.70(0.0302)*	4.70(0.0302)*
	FDI does not Granger-cause B2	0.60(0.4393)	0.60(0.4393)
	B2 does not Granger-cause FDI	3.94(0.0472)*	3.94(0.0472)*
Zambia	FDI does not Granger-cause B1	0.47(0.4929)	0.47(0.4929)
	B1 does not Granger-cause FDI	1.22(0.2694)	1.22(0.2694)
	FDI does not Granger-cause B2	0.00(0.9904)	0.00(0.9904)
	B2 does not Granger-cause FDI	0.78(0.3783)	0.78(0.3783)

Note: *   *Significant at 5 percent levels*
          ** *Significant at 10 percent levels.*
In the multivariate model, variables economic growth and trade openness have been included in the regressions.

Causality between FDI and Stock Market Development

Table 2 presents the results of the causality tests between FDI and two indicators of stock markets development (S1 and S2)in a VECM estimation. As shown in Table 2, S1 is not causally related with FDI in the case of Chile and Colombia. For Malaysia, South Africa, and Thailand, the causality tests show that the direction of causality between FDI and S1 is bi-directional. For Mexico and Philippines, the direction of causality is from FDI to S1, while for Nigeria the causality runs from S1 to FDI. With regard to S2, the VECM estimation linduates that the direction of causality between FDI and S2 for India, Mexico, Philippines, Singapore, and Thailand is bi-directional. In the case of Malaysia, the result shows that FDI significantly causes S2, while in Argentina, Chile, Colombia, Peru, and Venezuela, the direction of causality runs from S2 to FDI.

The results from the multivariate VECM model shown in column 4 of Table 2 are consistent with the results obtained from the bivariate VECM model. Specifically, causality tests based on the multivariate model show that the direction of causality between FDI and S1 is bi-directional in the case of Malaysia, Philippines, South Africa, and Thailand. However, for Colombia, Mexico and Nigeria, the causality runs from S1 to FDI, and not vice versa. With regard to the causality between FDI and S2, this study finds that the direction of causality between these two variables is bi-directional in the case of India, Mexico, Nigeria, Peru, Philippines, Singapore, and Thailand. The unidirectional causality from FDI to S2 is significant for Malaysia, while for Argentina, Chile, Colombia, South Africa, and Venezuela, S2 causes FDI.

Table 2: Granger-Causality Tests between FDI and Stock Market Development

Country	Null hypothesis	Wald Statistics	
		Bivariate	Multivariate
(1)	(2)	(3)	(4)
Argentina	FDI does not Granger-cause S2	2.57(0.6323)	2.57(0.6323)
	S2 does not Granger-cause FDI	16.89(0.0020)*	16.89(0.0020)*
Chile	FDI does not Granger-cause S1	2.44(0.6561)	2.44(0.6561)
	S1 does not Granger-cause FDI	5.60(0.2308)	5.60(0.2308)
	FDI does not Granger-cause S2	5.17(0.2706)	5.17(0.2706)
	S2 does not Granger-cause FDI	28.29(0.0001)*	28.29(0.0001)*
Colombia	FDI does not Granger-cause S1	0.02(0.8983)	4.62(0.3287)
	S1 does not Granger-cause FDI	2.34(0.1259)	10.24(0.0366)*
	FDI does not Granger-cause S2	3.46(0.4842)	1.68(0.1947)
	S2 does not Granger-cause MDI	20.18(0.0005)*	5.38(0.0203)*
India	FDI does not Granger-cause S2	21.93(0.0001)*	34.86(0.0001)*
	S2 does not Granger-cause FDI	42.11(0.0001)*	20.41(0.0004)*
Malaysia	FDI does not Granger-cause S1	22.94(0.0001)*	22.94(0.0001)*
	S1 does not Granger-cause FDI	9.50(0.0496)*	9.50(0.0496)*
	FDI does not Granger-cause S2	45.70(0.0001)*	45.70(0.0001)*
	S2 does not Granger-cause FDI	3.10(0.5406)	3.10(0.5406)
Mexico	FDI does not Granger-cause S1	4.85(0.0277)*	2.77(0.5964)
	S1 does not Granger-cause FDI	0.24(0.6272)	16.72(0.0022)*
	FDI does not Granger-cause S2	20.97(0.0003)*	20.97(0.0003)*
	S2 does not Granger-cause FDI	9.67(0.0464)*	9.67(0.0464)*
Nigeria	FDI does not Granger-cause S1	3.14(0.5353)	3.14(0.5353)
	S1 does not Granger-cause FDI	20.77(0.0004)*	20.77(0.0004)*
	FDI does not Granger-cause S2	0.22(0.6363)	41.23(0.0001)*
	S2 does not Granger-cause FDI	0.62(0.4310)	15.84(0.0032)*
Peru	FDI does not Granger-cause S2	1.71(0.1907)	17.55(0.0015)*
	S2 does not Granger-cause FDI	18.45(0.0001)*	125.59(0.0001)*
Philippines	FDI does not Granger-cause S1	3.26(0.0709)**	12.13(0.0164)*
	S1 does not Granger-cause FDI	0.61(0.4331)	20.34(0.0004)*
	FDI does not Granger-cause S2	14.76(0.0052)*	14.76(0.0052)*
	S2 does not Granger-cause FDI	26.30(0.0001)*	26.30(0.0001)*
Singapore	FDI does not Granger-cause S2	17.86(0.0013)*	17.86(0.0013)*
	S2 does not Granger-cause FDI	19.23(0.0007)*	19.23(0.0007)*

Table 2 (continued)

South Africa	FDI does not Granger-cause S1	7.33(0.0068)*	10.16(0.0378)*
	S1 does not Granger-cause FDI	3.49(0.0616)**	24.23(0.0001)*
	FDI does not Granger-cause S2	0.10(0.7939)	7.36(0.1179)
	S2 does not Granger-cause MDI	0.00(0.9983)	9.37(0.0526)**
Thailand	FDI does not Granger-cause S1	4.41(0.0356)*	4.41(0.0356)*
	S1 does not Granger-cause FDI	11.30(0.0008)*	11.30(0.0008)*
	FDI does not Granger-cause S2	33.03(0.0001)*	33.03(0.0001)*
	S2 does not Granger-cause FDI	12.79(0.0123)*	12.79(0.0123)*
Venezuela	FDI does not Granger-cause S2	0.72(0.8507)	0.32(0.8507)
	S2 does not Granger-cause FDI	49.03(0.0001)*	49.03(0.0001)*

Note: *   *Significant at 5 percent levels*
            ** *Significant at 10 percent levels*
In multivariate model variables economic growth and trade openness have been included in the regressions.

Conclusion

In summary, in most of the cases, the causality tests show that FDI and banking development indicators are not causally related. For the hypothesis that FDI causes B1, this study finds that the causality is significant in only 5 cases. More over, for the opposite causality that runs from B1 to FDI, the causality is significant in 11 cases. Similar pattern can also be observed in the causality between B2 and FDI where these two variables generally are not causally related. With regard to the causality between FDI and stock market development, in general, this paper finds that FDI and stock market indicators are causally related.

In conclusion, the results from causality tests give little support for the hypothesis that the inflows of FDI can contribute to the development of the domestic banking sector in developing countries. The effects of FDI on the domestic banking sector also differ from country to country. However, in the majority of developing countries, this study finds that FDI has no effect on the development of the domestic banking sector. Only in some developing countries, FDI was found to significantly affect the development of the domestic banking sector. This study also finds little support for the argument that the development of the domestic banking sector causes FDI. This indicates that the development of the domestic banking sector alone is not a crucial factor in determining the inflows of FDI to developing countries. In contrast, this study finds strong support for the hypotheses that FDI can affect the development of the domestic stock markets in the developing countries, and vice versa. Furthermore, the significant reverse causality from stock markets development to FDI indicates that the existence of a better-developed stock market is essential for attracting FDI.

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Appendix 1: **List of countries**

Algeria**
Argentina*
Barbados**
Bolivia**
Brazil**
Central Africa**
Chile*
Colombia*
Congo Republic**
Costa Rica**
El Salvador**
Ghana**
Guatemala**
Honduras**
India*
Indonesia**
Israel**
Jamaica**
Kenya**
Malaysia*
Mauritania**
Mauritius**
Mexico*
Morocco**
Nigeria*
Pakistan**
Panama**
Paraguay**
Philippines*
Peru*
Singapore*
South Africa*
Sri Lanka**
Thailand*
Tunisia**
Venezuela*
Zambia**

Note: ** *Credit markets only*
           * *Credit markets and stock markets*

Appendix 2: Unit Root Tests

Country (1)	Variables (2)	Levels		First Differences	
		ADF (3)	PP (4)	ADF (5)	PP (6)
Algeria	FDI	-4.8972(5)*	-4.9327(5)*	-	-
	B1	-1.6578(1)	-1.3077(1)	-3.7491(1)*	-3.7005(1)*
	B2	-0.7048(1)	-0.5659(1)	-3.4568(1)*	-4.0831(1)*
Argentina	FDI	2.1771(1)	2.3629(1)	-2.5770(1)	-4.1350(1)*
	B1	-2.2690(1)	-2.2690(1)	-4.1492(1)*	-4.1492(1)*
	B2	-2.8122(1)	-3.3342(1)*	-	-
	S2	-0.6645(5)	-2.3011(5)	-1.5189(4)	-7.5821(4)*
Barbados	FDI	-5.2249(5)*	-2.5044(5)	-3.8105(7)*	-7.6284(7)*
	B1	0.8646(5)	-0.5492(5)	-3.3697(3)*	-7.4132(3)*
	B2	1.1536(5)	-0.7085(5)	-3.1943(3)*	-3.8377(3)*
Bolivia	FDI	1.2248(1)	-1.1880(1)	-3.2964(1)*	-7.1004(1)*
	B1	0.3719(1)	0.5082(1)	-3.3258(1)*	-4.7996(1)*
	B2	0.8539(1)	1.0422(1)	-3.3341(1)*	-4.6095(1)*
Brazil	FDI	-1.1915(4)	0.3295(4)	0.2481(3)	-4.3342(3)*
	B1	-1.6031(3)	-3.1263(3)*	-	-
	B2	-2.6688(2)	-3.4349(2)*	-	-
Central Africa	FDI	-3.2225(1)*	-3.8422(1)*	-	-
	B1	-2.7360(1)	-2.9516(1)	-4.2053(1)*	-2.9516(1)**
	B2	-0.9385(3)	-1.6322(3)	-5.5855(2)*	-6.5196(2)*
Chile	FDI	2.4381(2)	1.9487(2)	-2.2051(3)	-7.2599(3)*
	B1	-0.9145(2)	-1.1413(2)	-5.0482(1)*	-4.7446(1)*
	B2	-1.8657(2)	-1.2916(2)	-2.1093(1)	-4.8089(1)*
	S1	-2.7066(5)	-3.4672(5)*	-	-
	S2	-1.2153(1)	-1.1876(1)	-4.3472(2)*	-4.4616(2)*
Colombia	FDI	-0.6159(2)	-2.3396(2)	-6.2129(1)*	-4.4192(1)*
	B1	-1.4132(1)	-1.3828(1)	-3.4354(4)*	-5.1011(4)*
	B2	-1.6822(1)	-1.7340(1)	-2.7217(1)	-3.5389(1)*
	S1	-1.8102(1)	-1.1228(1)	-3.7410(1)*[a]	-5.3652(1)*[a]
	S2	-1.4424(1)	-1.8272(1)	-3.3584(1)*	-5.6981(1)*
Congo Republic	FDI	-3.6429(4)*	-3.9301(4)*	-	-
	B1	-3.6138(5)*	-2.3515(5)	-	-
	B2	-3.1006(1)*	-2.4724(1)	-	-
Costa Rica	FDI	0.6095(1)	-0.1839(1)	-3.5531(1)*	-8.0209(1)*
	B1	-1.9767(1)	-2.2565(1)	-3.9694(1)*	-8.6411(1)*
	B2	-1.3837(1)	-1.3794(1)	-4.5978(1)*	-5.1438(1)*
El Salvador	FDI	-1.9299(1)	-4.4333(1)*	-	-
	B1	-0.4838(1)	-0.4734(1)	-3.0364(1)*	-4.7447(1)*
	B2	-0.6837(1)	-0.5311(1)	-2.7988(1)**	-4.3246(1)*
Ghana	FDI	-2.6613(1)	-3.9452(1)*	-	-
	B1	-1.6422(1)	-1.6433(1)	-4.2103(1)*	-5.2842(1)*
	B2	-1.1421(1)	-1.1302(1)	-2.0354(2)	-4.8388(2)*
Guatemala	FDI	-3.8223(1)*	-4.6863(1)*	-	-
	B1	-2.2378(2)	-3.7095(2)*	-	-
	B2	-1.3384(1)	-1.2566(1)	-3.8260(1)*	-4.9921(1)*

Appendix 2 (continued)

Honduras	FDI	0.3148(1)	0.0751(1)	-4.2092(1)*	-6.0739(1)*
	B1	0.9050(1)	0.8855(1)	-2.5277(1)	-4.0624(1)*
	B2	-2.6103(2)	-1.4732(2)	-4.4507(1)*[a]	-7.3234(1)*[a]
India	FDI	-2.8142(3)	-1.1166(3)	-4.0673(4)*	-5.2486(4)*
	B1	-3.5894(1)*	-5.2094(1)*	-	-
	B2	-1.9899(1)	-2.1160(1)	-2.4611(1)	-3.5727(1)*
	S2	1.4967(1)	2.0542(1)	-4.9634(1)*[a]	-7.1429(1)*[a]
Indonesia	FDI	-2.3309(3)	-1.7894(3)	-2.4677(3)	-3.4225(3)*
	B1	0.9449(1)	1.3027(1)	-3.1749(1)*	-4.0819(1)*
	B2	-2.0587(1)	-1.5911(1)	-3.6836(1)*[a]	-4.4302(1)*[a]
Israel	FDI	-0.2094(2)	-0.3460(2)	-1.1732(5)	-4.8873(5)*
	B1	-2.0681(1)	-1.9218(1)	-4.2554(1)*	-4.5861(1)*
	B2	-0.6837(1)	-1.5238(1)	-4.0225(1)*	-4.4829(1)*
Jamaica	FDI	-1.0812(2)	-2.5683(2)	-2.9282(3)	-4.6498(3)*
	B1	-1.8705(1)	-1.8965(1)	-4.0842(1)*	-5.2066(1)*
	B2	-3.0251(1)*	-2.3886(1)	-	-
Kenya	FDI	-2.6053(1)	-3.9489(1)*	-	-
	B1	-1.7708(1)	-1.8072(1)	-4.1787(1)*	-5.5629(1)*
	B2	-2.6868(1)	-2.7476(1)**	-	-
Malaysia	FDI	-2.4472(1)	-2.0775(1)	-2.5472(4)	-4.1112(4)*
	B1	-1.2958(1)	-1.3379(1)	-4.3716(3)*	-5.4937(3)*
	B2	-0.1158(1)	-0.1518(1)	-3.7505(3)*	-5.3638(3)*
	S1	-0.6775(4)	-1.3987(4)	-2.8336(3)	-3.1960(3)*
	S2	-1.5366(3)	-2.1038(3)	-5.9239(1)*	-5.4497(1)*
Mauritania	FDI	-3.2258(1)*	-3.9903(1)*	-	-
	B1	-1.9518(1)	-1.8168(1)	-3.9856(1)*	-5.6847(1)*
	B2	-2.8738(2)	-2.1130(2)	-3.0447(4)*	-4.7127(4)*
Mauritius	FDI	-2.1971(1)	-2.5367(1)	-4.8168(1)*	-5.7170(1)*
	B1	0.7189(1)	0.5712(1)	-3.1622(1)*	-7.0639(1)*
	B2	2.3620(4)	1.9561(4)	-1.1839(4)	-5.8739(4)*
Mexico	FDI	-1.4556(1)	-1.4411(1)	-4.4265(1)*	-5.1313(1)*
	B1	-2.3574(1)	-2.8229(1)	-5.2355(1)*	-6.9540(1)*
	B2	-1.8462(1)	-1.7439(1)	-3.8579(1)*	-4.9370(1)*
	S1	-2.0226(1)	-1.2508(1)	-2.9561(1)**[a]	-4.0294(1)*[a]
	S2	-1.4587(1)	-1.6012(1)	-3.6879(1)*	-5.4389(1)*
Morocco	FDI	-2.3708(1)	-2.0927(1)	-3.3521(1)*	-4.4981(1)*
	B1	0.1118(1)	0.2008(1)	-3.6669(1)*	-7.0229(1)*
	B2	0.0873(4)	-0.7698(4)	-3.8752(3)*	-5.2693(3)*
Nigeria	FDI	-2.0736(1)	-3.0003(1)*	-	-
	B1	-1.5454(1)	-1.4037(1)	-2.9119(1)**	-4.2226(1)*
	B2	-1.5662(1)	-1.4926(1)	-3.1066(1)*	-4.8878(1)*
	S1	-1.2238(1)	-2.1118(1)	-3.4530(2)*	-4.4712(2)*
	S2	2.3906(3)	0.5598(3)	-5.4237(2)*[a]	-2.3691(2)[a]
Pakistan	FDI	0.1529(3)	-2.6883(3)*	-	-
	B1	-2.3423(3)	0.7619(3)	-6.3654(1)*	-3.9807(1)*
	B2	-2.2302(1)	0.5529(1)	-7.1388(1)*[a]	-8.1003(1)*[a]

Appendix 2 (continued)

Panama	FDI	-3.1162(1)*	-2.8289(1)**	-	-
	B1	0.4953(1)	0.9002(1)	-2.9285(1)**	-3.9807(1)*
	B2	-0.4895(2)	0.1251(2)	-3.9112(1)*[a]	-9.5038(1)*[a]
Paraguay	FDI	-2.6074(1)	-3.4356(1)*		
	B1	-0.3556(1)	-0.2825(1)	-3.2946(1)*	-4.2654(1)*
	B2	-1.5330(2)	-0.5131(2)	-2.6078(1)	-4.3126(1)*
Peru	FDI	-1.2641(1)	-1.7567(1)	-3.6066(1)*	-7.6091(1)*
	B1	-2.0572(1)	-2.2029(1)	-4.2942(2)*	-5.9461(2)*
	B2	-2.6274(5)	-0.9569(5)	-3.5369(2)*	-3.9862(2)*
	S2	-1.6098(1)	-1.0107(1)	-3.787(1)*[a]	-4.8108(1)*[a]
Philippines	FDI	-1.6257(1)	-2.7743(1)**	-	-
	B1	1.5217(1)	1.6196(1)	-2.7232(1)	-5.0202(1)*
	B2	-3.2129(2)*	-1.6364(2)	-	-
	S1	-1.5508(1)	-1.0322(1)	-3.5117(1)*	-2.6869(1)**
	S2	-0.2652(1)	-0.2995(1)	-2.6892(3)	-5.1942(3)*
Singapore	FDI	-2.7599(1)	-3.0403(1)*	-	-
	B1	-0.7100(1)	-0.7068(1)	-3.7907(1)*	-4.4279(1)*
	B2	-1.4908(1)	-1.4808(1)	-2.8269(1)	-4.3624(1)*
	S2	-1.5532(1)	-1.8300(1)	-4.6227(1)*	-5.4451(1)*
South Africa	FDI	-2.7061(1)	-4.0221(1)*	-	-
	B1	-1.2221(1)	-1.2455(1)	-4.3141(1)*	-5.3293(1)*
	B2	1.6678(1)	2.1222(1)	-3.347(2)*[a]	-3.7902(2)*[a]
	S1				
	S2	2.6542(1)	4.9424(1)	-4..926(1)*[a]	-6.8126(1)*[a]
Sri Lanka	FDI	-1.1826(2)	-2.7868(2)**	-	-
	B1	-1.9757(1)	-1.9646(1)	-4.5198(1)*	-5.1236(1)*
	B2	-1.2256(2)	-1.3493(2)	-6.2824(2)*[a]	-11.2291(2)*[a]
Thailand	FDI	-0.9616(1)	-1.0228(1)	-3.1762(1)*	-5.3121(1)*
	B1	1.5350(2)	1.7481(2)	-3.9800(1)*	-3.7355(1)*
	B2	-2.0606(1)	-0.2887(1)	-2.2555(1)[a]	-4.6663(1)*[a]
	S1	-0.8559(2)	-1.4329(2)	-3.711(1)*[a]	-2.774(1)**[a]
	S2	-1.7822(1)	-1.4731(1)	-2.8003(1)	-2.8518(1)**
Tunisia	FDI	-3.1561(1)*	-4.6115(1)*	-	-
	B1	-2.8982(2)	-1.9469(2)	-4.6918(1)*	-6.7805(1)*
	B2	-1.7930(2)	-1.5213(2)	-5.0525(1)*	-5.4701(1)*
Venezuela	FDI	-1.2510(1)	-2.2397(1)	-3.6148(5)*	-9.8569(5)*
	B1	-1.0836(1)	-0.9890(1)	-2.9471(1)**	-4.5576(1)*
	B2	-0.7937(1)	-0.6481(1)	-2.9661(1)*	-4.3263(1)*
	S2	-2.3907(1)	-2.1611(1)	-4.2837(1)*	-4.1456(1)*
Zambia	FDI	-2.1812(1)	-8.7897(1)*	-	-
	B1	-1.4693(1)	-1.5952(1)	-3.4185(1)*	-6.1047(1)*
	B2	-1.8955(1)	-1.8202(1)	-3.8559(1)*	-4.3176(1)*

Note: * *Indicates rejection of the null hypothesis at the 5% levels of significance.*
   ** *Indicates rejection of the null hypothesis at the 10% levels of significance.*
   [a] *Test statistics are from second differences*
   Tests are based on Mckinnon critical values for rejection of hypothesis of a unit root.
   Figures in parentheses are lag length, and has been determined   according to the
     Akaike Information Criteria (AIC). The equation contains intercept without trend.

Appendix 3: Cointegration Tests

Country	Cointegrating Vector	Null Hypothesis	Test Statistics	Conclusion
Algeria	FDI, B1	r=0	17.38**	c
		r≤ 1	3.38**	
	FDI, B2	r=0	13.75**	c
		r≤ 1	0.59	
Argentina	FDI, B1	r=0	6.9	nc
		r≤ 1	1.48	
	FDI, B2	r=0	10.63	nc
		r≤ 1	1.43	
	FDI, S2	r=0	17.3*	c
		r≤ 1	0.33	
Barbados	FDI, B1	r=0	18.49*	c
		r≤ 1	0.09	
	FDI, B2	r=0	26.47*	c
		r≤ 1	0.19	
Bolivia	FDI, B1	r=0	15.71*	c
		r≤ 1	0.63	
	FDI, B2	r=0	11.88	nc
		r≤ 1	0.01	
Brazil	FDI, B1	r=0	21.41*	c
		r≤ 1	0.45	
	FDI, B2	r=0	24.68*	c
		r≤ 1	0.6	
Central Africa	FDI, B1	r=0	18.91*	c
		r≤ 1	6.69**	
	FDI, B2	r=0	14.98**	c
		r≤ 1	1.04	
Chile	FDI, B1	r=0	5.67	nc
		r≤ 1	2.62	
	FDI, B2	r=0	5.31	nc
		r≤ 1	2.57	
	FDI, S1	r=0	10.32	nc
		r≤ 1	2.84*	
	FDI, S2	r=0	9.26	nc
		r≤ 1	1.62	

Appendix 3 (continued)

	FDI, B1	r=0	18.64*	c
		r≤ 1	3.17**	
	FDI, B2	r=0	13.84**	c
		r≤ 1	5.33*	
Colombia	FDI, S1	r=0	16.09*	c
		r≤ 1	9.39*	
	FDI, S2	r=0	16.28*	c
		r≤ 1	2.56	
	FDI, B1	r=0	15.44*	c
		r≤ 1	8.58*	
Congo Republic	FDI, B2	r=0	17.95*	c
		r≤ 1	8.58*	
	FDI, B1	r=0	5.43	nc
		r≤ 1	0.04	
Costa Rica	FDI, B2	r=0	13.12	nc
		r≤ 1	1.33	
	FDI, B1	r=0	10.03	nc
		r≤ 1	2.79**	
El Salvador	FDI, B2	r=0	9.87	nc
		r≤ 1	0.81	
	FDI, B1	r=0	10.29	nc
		r≤ 1	2.57	
Ghana	FDI, B2	r=0	12.29	nc
		r≤ 1	5.59*	
	FDI, B1	r=0	28.82*	c
		r≤ 1	10.79*	
Guatemala	FDI, B2	r=0	15.84*	c
		r≤ 1	2.21	
	FDI, B1	r=0	19.90*	c
		r≤ 1	1.01	
Honduras	FDI, B2	r=0	9.66	nc
		r≤ 1	0.39	
	FDI, B1	r=0	11.96	nc
		r≤ 1	0.85	
	FDI, B2	r=0	4.38	nc
India		r≤ 1	0.75	
	FDI, S2	r=0	39.52*	c
		r≤ 1	8.52**	
	FDI, B1	r=0	14.98**	c
		r≤ 1	4.24*	
Indonesia	FDI, B2	r=0	19.27*	c
		r≤ 1	3.41	
	FDI, B1	r=0	5.74	nc
		r≤ 1	0.03	
Israel	FDI, B2	r=0	6.25	nc
		r≤ 1	0.12	

Appendix 3 (continued)

Jamaica	FDI, B1	r=0	18.43*	c
		r≤ 1	3.73	
	FDI, B2	r=0	21.09*	c
		r≤ 1	7.72	
Kenya	FDI, B1	r=0	12.85	nc
		r≤ 1	2.72*	
	FDI, B2	r=0	12.92	nc
		r≤ 1	4.82*	
Malaysia	FDI, B1	r=0	11.09	nc
		r≤ 1	4.28*	
	FDI, B2	r=0	11.09	nc
		r≤ 1	4.28*	
	FDI, S1	r=0	21.45*	c
		r≤ 1	3.76**	
	FDI, S2	r=0	19.80*	c
		r≤ 1	4.59*	
Mauritania	FDI, B1	r=0	17.24*	c
		r≤ 1	3.84*	
	FDI, B2	r=0	15.88*	c
		r≤ 1	5.79*	
Mauritius	FDI, B1	r=0	11.19	nc
		r≤ 1	0.67	
	FDI, B2	r=0	13.25*	c
		r≤ 1	4.73*	
Mexico	FDI, B1	r=0	7.45	nc
		r≤ 1	2.47	
	FDI, B2	r=0	6.82	nc
		r≤ 1	1.87	
	FDI, S1	r=0	17.16*	c
		r≤ 1	2.07	
	FDI, S2	r=0	12.05	nc
		r≤ 1	2.54	
Morocco	FDI, B1	r=0	16.71*	c
		r≤ 1	0.07	
	FDI, B2	r=0	8.58	nc
		r≤ 1	0.77	
Nigeria	FDI, B1	r=0	15.49*	c
		r≤ 1	4.33	
	FDI, B2	r=0	9.97	nc
		r≤ 1	3.27**	
	FDI, S1	r=0	13.06	nc
		r≤ 1	1.75	
	FDI, S2	r=0	17.26*	c
		r≤ 1	1.93	
Pakistan	FDI, B1	r=0	18.21*	c
		r≤ 1	0.67	
	FDI, B2	r=0	8.98	nc
		r≤ 1	1.23	

Appendix 3 (continued)

Panama	FDI, B1	r=0	20.84*	c
		r≤ 1	0.19	
	FDI, B2	r=0	34.73*	c
		r≤ 1	0.29	
Paraguay	FDI, B1	r=0	11.57	nc
		r≤ 1	0.58	
	FDI, B2	r=0	11.58	nc
		r≤ 1	0.36	
Peru	FDI, B1	r=0	11.82	nc
		r≤ 1	3.46**	
	FDI, B2	r=0	13.97**	c
		r≤ 1	3.57**	
	FDI, S2	r=0	23.08*	c
		r≤ 1	3.07**	
Philippines	FDI, B1	r=0	19.62*	c
		r≤ 1	0.06	
	FDI, B2	r=0	13.66**	c
		r≤ 1	5.51*	
	FDI, S1	r=0	11.08	nc
		r≤ 1	2.81**	
	FDI, S2	r=0	8.18	nc
		r≤ 1	0.31	
Singapore	FDI, B1	r=0	15.3**	c
		r≤ 1	2.48**	
	FDI, B2	r=0	11.2	nc
		r≤ 1	0.88	
	FDI, S2	r=0	10.9	nc
		r≤ 1	1.67	
South Africa	FDI, B1	r=0	18.60*	c
		r≤ 1	4.15*	
	FDI, B2	r=0	15.09*	c
		r≤ 1	3.02*	
	FDI, S1	r=0	14.4*	c
		r≤ 1	4.27*	
	FDI, S2	r=0	15.80*	c
		r≤ 1	1.2	
Sri Lanka	FDI, B1	r=0	23.49*	c
		r≤ 1	4.57*	
	FDI, B2	r=0	23.51*	c
		r≤ 1	2.14	
Thailand	FDI, B1	r=0	12.13	nc
		r≤ 1	1.23	
	FDI, B2	r=0	7.81	nc
		r≤ 1	0.31	
	FDI, S1	r=0	15.14**	c
		r≤ 1	0.01	
	FDI, S2	r=0	19.24*	c
		r≤ 1	0.43	

Appendix 3 (continued)

Tunisia	FDI, B1	r=0	16.63*	c
		r≤ 1	4.82*	
	FDI, B2	r=0	18.10*	c
		r≤ 1	3.86*	
Venezuela	FDI, B1	r=0	7.87	nc
		r≤ 1	1.25	
	FDI, B2	r=0	6.31	nc
		r≤ 1	0.16	
	FDI, S2	r=0	6.17	nc
		r≤ 1	0.45	
Zambia	FDI, B1	r=0	17.71*	c
		r≤ 1	0.67	
	FDI, B2	r=0	21.54*	c
		r≤ 1	1.43	

Note: * *Significant at 5% levels*
   ** *Significant at 10% levels*
   c – cointegrated
   nc – not cointegrated