Determinants Of Foreign Direct Investments In The South Asian Association For Regional Cooperation

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ABSTRACT

This paper aims to investigate the relationship between Foreign Direct Investment (FDI) inflows and their determinants in six major countries in the South Asian Association for Regional Cooperation (SAARC) over the period 1998 to 2010. Using panel data techniques, we account for the possible presence of both economic dependencies and structural breaks. The findings show that there are common variables of economic significance among the examined countries. Macro determinants, such as openness, growth rate, exchange rate, and economic instability, have a long-run impact on FDI inflows in the panel. The results are submitted to a battery of tests, including panel unit root and panel co-integration tests.

Keywords: Foreign Direct Investment; Economic Dependencies; Structural Breaks; South Asian Association for Regional Cooperation

1. INTRODUCTION

Since the mid-1980s, Foreign Direct Investments (FDI) flows have substantially increased at both the global and regional levels (Table 1). This increase has particularly affected developing countries, many of which were previously economically isolated and, therefore, unable to access international capital flows. The increase of FDI to countries belonging to the South Asian Association for Regional Cooperation (SAARC) is particularly significant - they received 3.888 billion United States dollars (USD) of FDI flows in 1998 alone, compared to a total of 2.385 billion during the entire period 1980 to 1989. According to statistics from the United Nations Conference on Trade and Development (UNCTAD), India, a SAARC member, was the fourth most important FDI destination for transnational corporations in 2010 (after China, Brazil and Singapore).

Table 1: Annual Inward and Outward FDI Flows (In Millions USD at Current Prices and Exchange Rates)

	1985	1998	2010
World (1)	55,866	706,266	1,309,001
SAARC (2)	173	3,888	28,098
(2)/(1)	0,003 %	0,005 %	2,1 %

Source: UNCTAD Stat.

The SAARC includes eight countries - Afghanistan, Bangladesh, Bhutan, India, the Maldives, Nepal, Pakistan, and Sri Lanka. In this study, only the six principal countries (Table 2) were selected because statistics for Afghanistan and Bhutan were not available or meaningful. The weight of FDI as a percentage of gross domestic product (GDP) has increased even among the poorest of these six countries, except Bangladesh (Table 2). This finding is likely to challenge the Lucas (1990) paradox.

Table 2: Basic Statistics for SAARC

	FDI* 1998	FDI* 2010	FDI/GDP 1998	FDI/GDP 2010
Bangladesh	575	913	1,3%	0,9%
India	2,633	24,159	0,6%	1,4%
Maldives	12	212	2,2%	14,3%
Nepal	12	87	0,24%	0,54%
Pakistan	506	2,012	0,7%	1,15%
Sri Lanka	150	478	0,92%	0,96%

Source: UNCTAD Stat. * US Dollars At Current Price And Current Exchange Rates, In Millions

This paper makes four contributions to the published research and literature on the determinants of FDI in emerging countries. First, it specifically focuses on SAARC countries, which, despite their significant increases in FDI inflows, have been examined by few studies until recently. Second, the present study confirms the relevance of the Kamaly model (2007). Third, panel data techniques were used and the possible presence of both economic dependencies and structural breaks were considered. Fourth, the results provide additional support for the macroeconomic approaches to the study of FDI determinants.

Section 2 presents a brief review of the literature on FDI; Section 3 describes the empirical approach that is employed to measure and explain FDIs; Section 4 presents and discusses the obtained results; and Section 5 provides some concluding remarks.

2. LITERATURE REVIEW

There is little research on the determinants of FDI in the SAARC region, mostly because data are not always available for all countries and major macroeconomic variables. Pradhan *et al.* (2011) study the determinant of FDI in seven SAARC countries over the period 1980 to 2010. Zafar (2013) examines the impact of a variety of factors (trade openness, market size, and cost of capital, among others) on FDI inflows into Bangladesh, India and Pakistan using time series data over the period 1991 to 2010. These studies conclude that there is a very strong and positive relationship between economic growth and FDI flows in this region.

However, there is no consensus on how a model that would lay the foundation for a general theory on the behavior of multinational firms and the determinants of FDI should be formalized. Different experts have highlighted the importance of economic (growth rate, infrastructures, macroeconomic stability), political (government attitude towards foreign investors, trade barriers, functioning of the political system) or environmental factors (public incentives, property rights) in this regard.

The literature on FDI is structured around two main questions (see the synthese of Dunning, 1977, 1981): 1) what the motivations of firms are and 2) which factors allow countries to attract foreign capital. The first question refers specifically to the analysis of firm internationalization processes and has been addressed in the literature by:

- Williamson (1975) in terms of transaction costs
- Johanson and Vahlue (1977, 2009) in terms of business networks (the Uppsala model)

The focus is on literature that addresses the second question. Macroeconomic studies from this perspective attempt to identify the main variables that influence FDI inflows to developing countries.

Mundell (1957) has played a pioneering role in establishing a link between the mobility of production factors (labor and capital) and trade. Noteworthy among more recent analyses is the seminal article of Calvo *et al.* (1993) which analyzes the case of Latin America countries. According to this paper, external factors (such as macro variables related to the US economy) partly explain the region's attractiveness for international capital flows. Another approach that takes external factors into account is the use of gravity models which incorporate the geographical distance between countries and international markets as an explanatory factor (Anderson, 1979; Fontagné and Pajot, 1997; Egger and Pfaffermayr, 2004).

The results of these types of empirical studies are subject to two important limitations: 1) they do not consider potential structural breaks caused by changes in the economic or political environment (reforms) and 2) they do not account for interdependencies among countries that are receiving FDI (although these links are likely to influence the attractiveness of these countries). Note that De Vita and Kyaw (2008) use Pedroni's (1999, 2004) test to capture heterogeneity across countries, but do not incorporate structural breaks.

In order to account for the dynamics that characterize FDI behavior and provide a methodological contribution to the study of FDI, structural breaks and economic interdependencies among the countries in the sample were simultaneously considered.

3. DATA AND EMPIRICAL SPECIFICATIONS

This section discusses the empirical determinants of FDI among six SAARC countries (Table 2). Quarterly data are provided by the World Bank and UNCTAD and cover the period 1998 to 2010. The choice of this period represents the following advantages in terms of relevance of estimates: 1) analysis of the period during which FDI flows started to become significant and 2) use of two periods that are significantly different in economic terms (a phase of prosperity until 2007 and a period of global financial crisis after 2008).

The empirical analysis was been conducted using panel techniques and is limited by data availability. The authors seek to explain inward investment in countries based on a number of macroeconomic variables such as economic openness, growth rate, inflation and exchange rates. These macroeconomic variables have already been used as factors that may influence FDI inflows. Following Kamaly (2007), a pragmatic approach using the model defined below was adopted:

$$(FDI/GDP)_{it} = \alpha_i + \beta OPEN_{it} + \gamma GROW_{it} + \delta INFL_{it} + \omega EXCHRATE_{it} + \varepsilon_{it} \quad (1)$$

where:

it : country i during period t , for $i = 1, \dots, 6$, and

ε_{it} : error term

The endogenous variable (FDI) is expressed as a percentage of GDP for two main reasons: 1) to control for size differences among countries and 2) to prevent the possibility of including a non-stationary or explosive dependent variable in the regression.

The OPEN variable is incorporated in the model to represent the economic openness of countries. It is defined by the sum of exports and imports that are accounted for in the GDP. The inclusion of this variable, which is widely used in the economic literature (i.e., Lim, 2001; Hasen *et al.*, 2007; Jallab *et al.*, 2008), is important because several countries in the SAARC region have engaged, in varying degrees, economic opening to facilitate the entry of foreign investors. The authors expect that this variable will positively affect FDI inflows.

The GROW variable (growth rate) can be interpreted as representation of the wealth of a host market. It is well-known that economic opportunities have improved in the SAARC region since the 1990s, making FDI more attractive (De Vita and Kyaw, 2008). It is anticipated that this variable will have a positive effect on the growth of FDI inflows.

The INFL variable, which indicates the inflation rate as measured by the Consumer Prices Index, is used in many studies as a proxy for economic instability. A high inflation rate creates uncertainty for multinational corporations with regard to their assets and liabilities (Abdellah *et al.*, 2012). Schneider and Frey (1985) indicate that firms will have fewer incentives to invest in countries with high inflation and find that inflation negatively affects FDI inflows. The sign of this variable is therefore expected to be negative.

The EXCHRATE variable defines a country's exchange rate and should have a negative impact on FDI (in this study, all currencies are expressed in their equivalent value in USD). The appreciation of a host country's currency discourages foreign investment aimed at acquiring that country's assets, whereas currency depreciation makes host country's assets become very interesting investment targets for foreigners.

4. RESULTS AND DISCUSSION

4.1. Panel Unit Root Tests

We use two types of tests: 1) the panel unit root test proposed by Breitung (2000) and Im *et al.* (2003) and 2) the structural breaks test of Carrion-i-Silvestre *et al.* (2005). Unlike the former test, the latter also accounts for the hypothesis of dependencies between the countries. The major advantage for adopting panel unit-root tests is their high power of exploiting cross-section dependence. The results are summarized in Table 3.

Table 3: Panel Unit Root Tests With and Without Structural Breaks

Variables	Breitung (2000) t-test	Im <i>et al.</i> (1997) W-test	Carrion-i-Silvestre <i>et al.</i> (2005) LM(λ)-test	
			Without Structural Breaks	With Structural Breaks
<i>FDI / GDP</i>	-1.112 (0.13)	-3.400 (0.07)	3.561 (0.000)	4.06 (0.000)
Δ (<i>FDI / GDP</i>)	-2.143 (0.014)	-6.700 (0.000)	-	-
<i>OPEN</i>	-1.819 (0.034)	-2.111 (0.097)	2.197 (0.000)	5.197 (0.000)
Δ <i>OPEN</i>	-1.342 (0.000)	-5.345 (0.000)	-	-
<i>INFL</i>	-2.288 (0.011)	-1.323 (0.077)	4.111 (0.000)	5.257 (0.000)
Δ <i>INFL</i>	-3.456 (0.000)	-5.003 (0.000)	-	-
<i>GROW</i>	-5.433 (0.000)	-5.001 (0.000)	1.512 (0.000)	3.064 (0.000)
<i>EXCHRATE</i>	-3.101 (0.000)	-3.425 (0.000)	7.148 (0.000)	9.250 (0.000)
Δ <i>EXCHRATE</i>	-6.771 (0.000)	-8.422 (0.000)	-	-

Note: For the test of Carrion and al. (2005), the number of breaks points has been estimated using LWZ information criteria allowing for a maximum $m^{\max} = 5$ structural breaks. The long variance is estimated using the Bartlett kernel with automatic spectral window bandwidth selection as in Andrews (1991). The p-values are in the brackets.

The results of the first two panel unit root tests, without dependencies and structural breaks (Breitung, 2000; Im *et al.*, 1997), indicate that variables are integrated of order one. Moreover, when applying two Carrion-i-Silvestre (2005) tests with and without structural breaks and considering international economic dependencies among the countries in the sample, it is observed that the series are stationary.

4.2. Panel Co-Integration Tests

Co-integration tests, in which neither economic dependencies nor structural breaks are taken into account, are applied. These tests include the test of Pedroni (1999, 2004) and the Cusum test of Westerlund (2005). Also applied were co-integration tests that consider dependencies and structural breaks. The results are provided in Table 4.

Table 4: Panel Co-Integration Tests without Dependencies and Structural Breaks

Panel ρ -statistics	0.031 (0.113)
Panel rho-statistics	2.141 (0.333)
Panel PP-statistics	5.112 (0.143)
Panel ADF-statistics	0.702 (0.123)
Group rho-statistics	-0.707 (0.124)
Group PP-statistics	-5.512 (0.145)
Group ADF-statistics	-1.222 (0.000)

Note: The null hypothesis of Pedroni (1999, 2004) tests is no co-integration. Probability values are in brackets.

The results of Pedroni's co-integration test (Table 4) indicate that all tests, except the last (Group ADF-statistics), reject the co-integration hypothesis. Similarly, the Cusum test of Westerlund (2005) generated the same results. These two types of co-integration tests may have failed to find a long-run equilibrium between variables because they did not take possible economic dependencies or structural breaks into account. Since 1990, the countries in the SAARC region have followed policies of economic openness and have developed economic relations among each other. In addition, countries in the SAARC region have experienced structural changes, mainly due to the implementation of reforms to attract new investment. Westerlund and Edgerton (2008) note the importance of considering economic dependencies and structural breaks when analyzing co-integration between macroeconomic and financial data. By following their approach, the results of these tests are presented in Table 5.

Table 5: Panel Co-Integration Tests with Dependencies and Structural Breaks (Westerlund and Edgerton, 2008)

Model	$Z_{\tau}(N)$		$Z_{\phi}(N)$	
	Value	P-value	Value	P-value
No break	-1.200	0.021	-4.044	0.000
Level break	-4.301	0.001	-3.402	0.000
Regime shift	-0.160	0.245	-2.104	0.052

Notes: The test is implemented using the Campbell and Perron (1991) automatic procedure to select the lag length. Three breaks were used, which are determined by grid search at the minimum of the sum of squared residuals. The P-values are for a one-sided test based on the normal distribution.

Having established co-integration among the variables, their impact on the FDI inflows are investigated. For this purpose, three techniques to estimate long-term relationships were proposed - the Fully-Modified Least Squares (FMOLS), Dynamic Ordinary Least Squares (DOLS), and Ordinary Least Squares (OLS) methods. The results are shown in Table 6.

Table 6: Long-Run Panel Estimators

Variables	FMOLS	DOLS	OLS
Openness	0.025 (4.222)***	0.075 (7.501)***	0.013* (1.751)
Inflation Rate	-0.054 (-1.990)**	-0.072 (-6.450)***	-0.067*** (4.324)
Growth Rate	-0.056 (-1.999)**	0.012 (4.120)***	-0.056*** (-3.700)
Exchange Rate	-0.0521 (-3.71)***	-0.024 (-4.370)***	-0.044** (-3.441)

*, **, *** denotes statistical significance level, respectively, at 10%, 5% and at the 1% level. The time effects were included in the model with panel group FMOLS and DOLS (Pedroni co-integration techniques are used) and t-Student tests are in the brackets.

In summary, the results of this set of estimations show that the macroeconomic variables included in the model have a long-term impact on inward FDI. However, among the three proposed estimation techniques, the results of the DOLS estimates suggest the strongest positive relationship among the variables in the authors' model. In the long run, openness and economic growth rate (with the expected sign) appear to have a positive impact on the FDI inflows into the considered region, whereas economic instability and the exchange rate have a negative effect.

5. CONCLUSION

In this paper, the impact of the macroeconomic determinants of FDI inflows into the SAARC region over the period 1998 to 2010 was investigated. Two potential factors that have been ignored in the economic literature on this subject were considered - economic dependencies and structural breaks. To do this, up-to-date panel techniques that take these two possibilities into account were applied.

Findings are consistent with the authors' initial expectations. The empirical results reveal that the macroeconomic variables have a long-term effect on the FDI inflows into the SAARC countries. However, economic instability and fluctuations in exchange rates have a negative effect on inward FDI flows and can therefore deter foreign investment.

The results have some implications for economic policy - if a government wants to attract foreign capital, it must pursue policies that encourage price stability, openness to international trade flows, increases in GDP per capita, and growth. This study highlights the need for policymakers in the SAARC region to design domestic policies that consider both external and internal shocks to variables that affect real economic activity.

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