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May 2007

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May 2007

Abstract

This paper attempts to find out the relationship between FDI, trade liberalization and economic growth for 5 South Asian countries during the period 1980-2004. Using panel data estimation, this paper empirically explores a significant and positive relationship between FDI and economic growth of South Asian economies and a positive but weak empirical evidence about the impact of trade liberalization on growth. A dynamic nature of the effect of FDI on host country investment is revealed from the observation that FDI of the previous year has a significant and positive impact of the domestic investment of the current year. In addition, the country-specific time series data demonstrates that FDI and trade liberalization causes growth in the cases of Bangladesh and Pakistan. The empirical evidence also reveals that FDI in Bangladesh crowds-in domestic investment, suggesting that more FDI inducing policies would be beneficial in enhancing the overall impact on economic growth.

Keywords: FDI, Trade Liberalization, Economic Growth, South Asia.

JEL Classification: F43, N15, 024, 030, 047.

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I. Introduction

Protectionist theories played a dominant role in the formation and implementation of industrialization policies, even before the 1980s, among the majority of the developing countries, which predominantly gave importance to import substitution industrialization strategies, based on advanced ideas given by Prebisch (1950) and Singer (1950). However, in the early 1980s, a group of economists recommended that development strategies should be based on market oriented reforms which include, among others, the reduction of trade barriers and the opening up of international trade to foreign competition (Edwards, 1993).[1] One of the most striking features of openness since the beginning of the 1980s in developing countries was the inflow of private capital in the form of foreign direct investment (FDI). Since then, FDI inflows have been considered as one of the important sources of economic growth in developing countries.

Though the gains from FDI inflows are unquestionable as it contributes to economic growth through an increase in productivity by providing new investment, better technologies and managerial skills to the host countries, however, the effect of FDI on domestic investment is an issue of concern as there is a possibility of displacement of domestic capital due to competition from foreign investors with their superior technologies and skills. Thus the ultimate impact of FDI on economic growth depends on the degree of capacity of the host country to use FDI as efficiently as possible. Similarly, trade liberalization may facilitate economic growth through efficiency in production by utilizing the abundant factors of production more effectively and absorbing better technologies from advanced countries on the one hand, it may harm the growth process on the other through various forms of macroeconomic instability such as terms of trade deterioration and balance of payments crisis. Thus, it is a challenge for developing countries to find out the appropriate direction of the role of FDI and trade liberalization in economic growth.

As part of developing countries, South Asian economies were also concerned with issues pertaining to foreign private capital inflow and trade liberalization initially. However, they later moved to liberalize their trade and investment policies to include various investment incentives, particularly, for foreign investors.[2] Along with these, South Asian countries has maintained high and steady economic growth, single-digit inflation rate; have a growing domestic market, a large number of low-paid workers with growing number of skilled personnel and a more favorable investment climate. As a consequence, South Asia, as a group, has been successful in attracting a significant amount of FDI and raising its volume of trade (export plus import) as percentage of GDP during the last one and half decades. The question which naturally arises here is whether the increase in growth was brought about by trade liberalization and FDI inflows. Therefore, it is important to explore the impact of FDI and trade liberalization on the growth process, quantitatively, in South Asian economies for a better understanding about the linkages among FDI, openness and economic growth.

[1] At the initial stage, the basic idea of the benefits of openness to developing countries was empirically identified by Krueger (1985), Bhagwati (1988), Bliss (1989) and Evans (1989).

[2] South Asia refers to Bangladesh, India, Nepal, Pakistan and Sri Lanka in this study, mainly due to time series data unavailability in the case of other countries.

This study seeks to find answer to the questions: (i) what is the relationship of FDI and trade liberalization with economic growth in South Asian countries; (ii) what is the direction of causality among FDI, trade liberalization and growth rate in these economies; and (iii) whether domestic investment and FDI are substitutes or complements in the context of these economies. To do so, the study first explains the historical trends of FDI, trade liberalization and economic growth using yearly data over a long time period of 1980-2004. Secondly, the empirical analysis is conducted by applying both panel estimation process and country-specific regression analysis. The contribution of this paper to the empirical analysis can be explained in several ways. First, the study adds to the empirical work by extending the coverage of the study to recent data, particularly during 1980-2004, which is significant as a period characterized by substantial inflows of FDI to countries in South Asia as well as a period of extensive reforms, particularly in policies related to trade, industry, fiscal and public sector enterprises and privatization. Second, the paper employs empirical analysis using both the panel and country-specific data. Using panel data in the estimation process, in general, ignores the country-specific impact of the respective variables. The paper overcomes this problem by employing country-specific analysis and opens the door for comparing the country-specific dynamics in results, even in the same region. And finally, this study considers trade liberalization as one of the sources of growth in South Asia and incorporates trade/GDP ratio in the growth function as a measure of trade liberalization with other variables. Previous attempts in this regard incorporated export growth or export/GDP ratio in the growth equation to show the effect of trade or trade liberalization on economic growth. However, these attempts can mislead the overall implications of trade liberalization as only export growth or export/GDP ratio doesn't show the extent of trade liberalization. This is probably the first attempt in this regard, especially in the area of growth equation estimation of the South Asian economies and thus needs a cautious approach in observing the effects of trade liberalization on growth of the region.

In the estimation process, the robust ordinary least squares (OLS) and panel estimation with fixed effects are employed for examining the impact of FDI and trade liberalization on economic growth. The results of the empirical analysis suggest that FDI has a positive and significant impact on growth process for South Asian economies. A weak evidence has been found in support of the hypothesis that trade liberalization for fosters growth in these countries. The results of the causality analysis suggest that no causal relationship is observed in the case of India, Nepal and Sri Lanka; however, FDI and trade liberalization cause economic growth in case of Bangladesh and Pakistan, not vice-versa. The study uses the Arellano-Bond GMM dynamic model with other conventional estimation techniques for searching any dynamic relationship between FDI and domestic investment and the results clearly indicate that FDI inflows of the previous year have a significantly positive impact on the domestic investment of the current year. These results have important implications for South Asian countries in formulating and implementing their policies toward FDI and openness.

The rest of the paper is organized as follows. Following the introduction in Section I, Section II reviews the links between FDI, trade liberalization and economic growth based on the existing theoretical and empirical literatures. The section also involves analysis of literature about the relationship between FDI and domestic investment. Section III provides an analysis of the historical trends in FDI, trade-GDP ratio as an indicator of trade liberalization and economic growth of South Asian countries and compares these indicators with that of other comparable

regions of the world. The models for final estimation and methodology employed for empirical analysis in the paper are discussed in Section IV. Section V provides data specification and empirically examines the impact of FDI and trade liberalization on growth in South Asia using both the panel and country specific estimation. The direction of causality among FDI, trade liberalization and growth and the relationship between FDI and domestic investment are also examined in this section. Finally, Section VI summarizes the major findings and their policy implications, particularly for Bangladesh.

II. Literature Review

Developing countries worldwide had a 'fear-mood' attitude towards FDI even until the mid-1980s due to open contentious debate about the unexpected costs and benefits of FDI inflows in the host countries. The debate developed due to the notion that FDI in developing countries was mostly concentrated on the low-priced primary export sector to developed countries and thus had a negative or insignificant impact on overall growth.[3] In effect, a large number of developing countries adopted closed macroeconomic policies during that period, which essentially encouraged import substitution industrialization policies, backed by a dominant role of the state in development policies. However, since the late 1980s the conception started to change in favour of FDI inflows into developing countries, due to a possibly positive contribution of FDI to growth through capital formation and technology transfer, enabling them to convert their comparative advantage into a global force. The lack of available capital for rapid industrialization in developing countries also recognized the role of FDI as a channel of capital mobility in the host economy. For these reasons, the inflow of FDI increased rapidly during the late 1980s and the 1990s in almost every region of the world, lending support to the view that FDI and economic growth are positively correlated.[4]

a. FDI and Economic Growth

Either Neo-classical growth models or endogenous growth models are considered as the theoretical basis for empirical studies on FDI and growth.[5] Most of the empirical studies which tried to investigate the relationship between growth and FDI used either of these growth models as the basis using both the cross-country and country-specific data for the analysis.[6] These

[3] See, for instance, Singer (1950) and Griffin (1970) as mentioned in Sahoo (2006); Singh (1988); Fry (1992); Hein (1992) for both theoretical and empirical evidence about the negative association between FDI and growth. On the other hand, Carkovic and Levine (2002); Ericsson and Irandoust (2001); Aitken *et al.* (1997); Mello (1997) and Harrison (1996) fail to find any relationship between FDI and growth.

[4] See, for instance, Blomstrom *et al.* (1994); Balasubramanyam *et al.* (1996); Dees (1998); De Mello (1996); Borenzstein *et al.* (1995) for both cross-country and country-specific panel and cross-section evidence on the positive correlation between FDI and growth. A systematic summary of literature on the determinants of, and the relation between, FDI and growth can be found in Lim (2001).

[5] In the neoclassical growth models, FDI leads to economic growth through increasing the volume of investment and its efficiency, whereas long-run growth in the endogenous growth models is a function of technological progress deriving from technology transfer, diffusion and spillover effects through FDI (Nair-Reichert and Weinhold, 2001). In the neoclassical model, capital accumulation is subject to diminishing returns, whereas there is a possibility of non-diminishing returns to capital through incorporating technology or role of knowledge endogenously in the new growth theories (Romer, 1994; and Grossman and Helpman, 1991).

[6] See, for instance, Balasubramanyam *et al.* (1996), Borensztein *et al.* (1998), Nair-Reichert and Weinhold (2001), Kumar and Pradhan (2002), Townsend (2003) (for less developed countries) for cross-country panel studies;

studies systematically incorporated FDI as one of the determinants of economic growth with other determinants of growth such as growth of labour, education and technological progress as suggested by the standard growth models. The incorporation of FDI in the growth models opened the door for discussion about the possible role of knowledge capital in economic growth, especially of the developing countries.

It is a well-established fact that developing countries suffer from a shortage of appropriate knowledge in the development process. In FDI literature, it is already recognized that FDI not only brings capital for productive development to the host economy, it also transfers a considerable amount of technical and managerial knowledge and skills, which is likely to spill over to domestic enterprises in that economy. In other words, FDI helps developing countries to reduce the 'knowledge gap' with the developed world by bringing both the managerial and technological knowledge and skill to the host countries. Thus FDI benefits the host economy more through different channels as compared to its direct impact which are recognized as the sources of the economic growth.[7]

The possible channels of gains from FDI inflows to the host country can be explained through its effects both directly and indirectly. It is already recognized that FDI inflow nurtures the growth process directly by increasing production resulting from the rise in the volume of investment. It also transfers technology pertaining to direct production and know-how such as managerial skills to the host country. FDI may provide a stock of knowledge to developing countries and make factors of production more productive. FDI can also stimulate the economic growth by augmenting trade if the FDI inflows are channeled to the export-oriented industries. The indirect positive effects (or positive externalities) of FDI inflows include technological spillovers to local firms and to local workers. It may also create a competitive business environment among domestic firms and could have a positive effect on the general price level.

The main arguments against the FDI inflow are that multinational companies (MNCs) bring monopoly resources as FDI, supplant domestic firms, introduce production technology inappropriate to the host economy and create balance of payments crisis through repatriation of profits from the host country (Sahoo, 2006). In general, the MNCs bringing FDI have a bunch of superior resources such as technology, organization capability, managerial skills and marketing know-how, which together may have a negative externality on the domestic firms as foreign firms erode their market share (Markusen and Venables, 1997; Agosin and Mayer, 2000; and Kumar and Pradhan, 2002). As a consequence, FDI may crowd out domestic investment in the relevant industries. In most of the cases, FDI inflows to developing countries utilize capital intensive techniques in the production process, which may lower the demand for the abundant factor of production, i.e., labour, in developing countries. If this happens in a labour abundant

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Agrawal (2000) and Sahoo (2006) for South Asian countries; and Athukorala (2003), Medina and Smith (2001) and Graham and Wada (2001) for country-specific studies. However, Chowdhury and Mavrotas (2006) examined the causal relationship between FDI and economic growth, somewhat differently, applying newly developed econometric method, namely the Toda-Yamamto test for causality for three developing countries: Chile, Malaysia and Thailand.

[7] Balasubramanyam *et al.* (1996) and Kumar and Pradhan (2002) identified the indirect effect on growth of these channels as the 'externalities of FDI' and argued that FDI's effect on growth in host countries could be more valuable than its direct impact on output by complementing the domestic investment due to its highly possible positive externalities. Externalities of FDI inflow are also known as the 'spill-over' effects in the literature.

country, it may lower the economic growth. Since the impact of FDI on economic growth is not clear from either the theoretical and empirical perspectives and thus need to examine in the case of South Asian countries.

b. Trade Liberalization and Growth

The development in the theory of endogenous economic growth, largely influenced by Romer (1986), Lucas (1988) and Mankiw *et al.* (1992), gives an opportunity to establish a *long-run equilibrium* relationship between national trade policies and economic growth. The initial idea is that a more open trade regime allows a country to specialize in the production of a subset of intermediate inputs in which it has comparative advantage. Consequently, a higher equilibrium rate of growth can be achieved from a lower cost of a large quantity of that input.[8] In his seminal article, Solow (1957) identified that trade liberalization can facilitate neutral technical change through technological efficiency by eliminating protection for import substitution industries. That is, trade liberalization can promote allocative efficiency by reorienting factors of production in favour of sectors in which the economy possesses a comparative advantage in trade as well as by allowing for a choice of techniques of production which reflects the factor endowments of the economy (Balasubramanyam *et al.* 1996). A little differently, Quah and Rauch (1990) mentioned that a closed economy which has to produce a large group of intermediate goods is likely to run into bottlenecks. Thus the country cannot face these problems under free trade regime which consequently helps it to grow faster than under autarky. On the other hand, Edwards (1992) pointed out that a country with a higher degree of openness can absorb technology developed in advanced nations at a faster rate and thus grow more rapidly than a country with a lower degree of openness.

However, counter arguments of free trade policies can also be found in a situation where economists argued that trade liberalization policies bring macroeconomic instability characterized by high and variable inflation on the one hand, and fiscal and balance-of-payments crises on the other (Rodrik, 1992). Terms of trade deterioration, exchange rate depreciation and capital outflows due to trade liberalization are strong arguments, among others, against trade related reforms. The argument in this case is that trade policies only can affect the volume of trade, but not the relationship between the levels of imports and exports. That is, tariff and non-tariff barriers to trade determine the openness of an economy, but not its trade balance, which is determined by the balance between national income and expenditures (Rodrik, 1992).

c. FDI vs. Domestic Investment

The effect of FDI inflows on domestic investment can have either positive or negative consequence due to its backward and forward linkages with local firms. That is, FDI may displace domestic investment by competing in product and financial market due to its superiority in technologies and skills, larger economies of scale and better management and production process (Borensztein *et. al.*, 1998 and Sahoo, 2006).[9] In this process, the MNCs may erode the market share of domestic firms. With these kinds of non-price rivalry modes, the survival of

[8] The idea can be found in Romer (1989) as cited in Edwards (1993).

[9] Other empirical studies include Fry (1993) for negative relationship between FDI and domestic investment and Hanson (2001) for weak relationship between those.

existing domestic firms and entry of new domestic firms may fall in question.[10] Conversely, it may encourage the expansion of domestic investment through production complementarity and through transferring advanced technologies and managerial techniques to domestic firms. There are a number of empirical evidences that support the view that domestically owned firms are positively related to the presence of foreign firms.[11] The outcomes of the studies vary according to the hypothesis on which research is undertaken. For example, some studies find that FDI has a positive and proportional impact on domestic investment, whereas a few studies suggest that the gain from FDI to local industries depends on the local firm's ability to capture the gain. This paper attempts to examine the impact of FDI on domestic investment for South Asian economies.

III. Historical Trends in FDI, Trade Liberalization and Economic Growth

The trends in FDI inflows, trade liberalization process and economic growth vary among country groups and regions, basically on the basis of policy issues pertaining to those. Economies in developing countries received increasingly larger shares in the world FDI inflows since the mid-1980s. After a decline of about 4 percent each year on average during 1980-85, FDI in developing countries increased by 17 percent each year during the latter half of the 1980s (Nair-Reichert and Weinhold, 2001). During the period 1993-1998, FDI inflows in developing countries reached $138.9 billion and further $233.2 billion in 2004, which constituted 35 percent share of global FDI inflows (*World Investment Report, 2005*). The substantial inflow of FDI into developing countries can largely be explained by the wave of privatization and cross-border mergers and acquisitions (*Global Development Finance Report, 2006*).

The FDI inflows into South Asia maintained increasing momentum, especially after the mid-1980s. Total FDI inflows to South Asia were $0.83 billion during 1980-84 with average annual growth of 5.34 percent. At that period, the share of FDI inflows to South Asia in the developing countries and in world were 1.02 percent and 0.28 percent, respectively. Over the next 10 years, the total FDI inflows to South Asia increased to $5.93 billion with average annual growth of 36.01 percent. Rapid FDI inflows were also observed during the second half of 1990s, reaching $18.11 billion. It is noteworthy that aggregate FDI inflows to South Asia reached a record $24.88 billion in 2000-04 with average annual growth of 19 percent. In particular, FDI in South Asia was $7.2 billion in 2004 and the share of that in both the developing countries and the world was 3.4 percent and 1.11 percent, respectively.

Not only are the FDI inflows to South Asian countries increasing, overall macroeconomic performance and trade indicators are exhibiting promising growth in the region as well. Table 1 depicts a comparative picture among different sub-regions of the world in terms of GDP growth rate, FDI inflow, trade/GDP ratio and growth rate of manufacturing production during 1980-2004. The comparison is based on the two sub-periods: 1980-1990 and 1991-2004. It is clear that the performance of the East Asia and the South Asian countries in terms of GDP growth rate is

[10] Easterly (1993) points out that preferential tax treatment and other incentives to FDI may create distortion between the return to foreign and domestic capital and could have a large negative effect on domestic investment and growth.

[11] See, for instance, Caves (1974); Globerman (1979); Nadiri (1991); and Imbriani and Reganati (1997); Bosworth and Collins (1999); Lipsey (2002) and Barrios et al. (2004).

better compared to that of the Latin American countries. The poor performance of Latin American countries in terms of GDP growth rate overshadows their better performance in attracting FDI and in increasing trade/GDP ratio. However, East Asian countries performed better in terms of all the indicators compared to the two other regions during the aforementioned period. Edwards (1993) argued that the poor performance of the Latin American countries was largely underpinned by its import substitution strategies, whereas aggressive implementation of outward oriented strategies was the key to rapid economic growth of the East Asian countries.

Among the three regions, South Asia adopted and implemented liberalization steps a little later than the other two regions. Although as a region, South Asia received very low FDI compared to its counterparts, it deserves applause for maintaining a high economic growth as well as a stable manufacturing growth and for increasing a considerable trade/GDP ratio since 1980 (Table 1). In terms of all indicators, the Bangladesh economy performed better in the latter period, 1991-04, compared to the earlier (1980-90), although it kept one of the lowest trade/GDP ratio in South Asia, just ahead of India.

However, the economies in South Asia were not uniformly successful in receiving FDI since 1980s. In general, the South Asian countries experienced a sharp increase in FDI inflows only since the beginning of 1990s. The institutional and trade related reform measures, initiated by the respective governments of the region at that time, resulted in a fivefold increase in the average ratio of FDI inflows to gross capital formation during the 1990s (ADB 2004).[12] Among individual recipient countries of FDI, India and Pakistan were the most favoured South Asian destinations for FDI during 1980-2004. In particular, India has been widely recognized for its success in attracting FDI in the Information Technology (IT) sector. Evidence shows that between 1980 and 1984 Pakistan was in the top position in receiving FDI, while India was the second choice to the foreign investor followed by Sri Lanka and Bangladesh.

However, there have been some major changes in the preferences of foreign investors since the mid 1980s. Pakistan dropped from the top position marginally during 1985-89 and was replaced by India. FDI inflows to Sri Lanka and Bangladesh moved lower during the said period. The reason can be partly explained by their political unrest and natural calamities at that time. A robust FDI inflow to India has been observed since the 1990s with poor performance in FDI received by other South Asian countries. In particular, the decade 1995-2004 witnessed a dramatic increase in FDI flows in India.

[12] The various reform measures adopted by the South Asian countries as part of trade liberalization and to attract FDI are described in the Appendix A2.

TABLE 1
Growth, FDI and Trade in Latin America, East Asia and South Asia: 1980-2004 (Percentage Distribution)

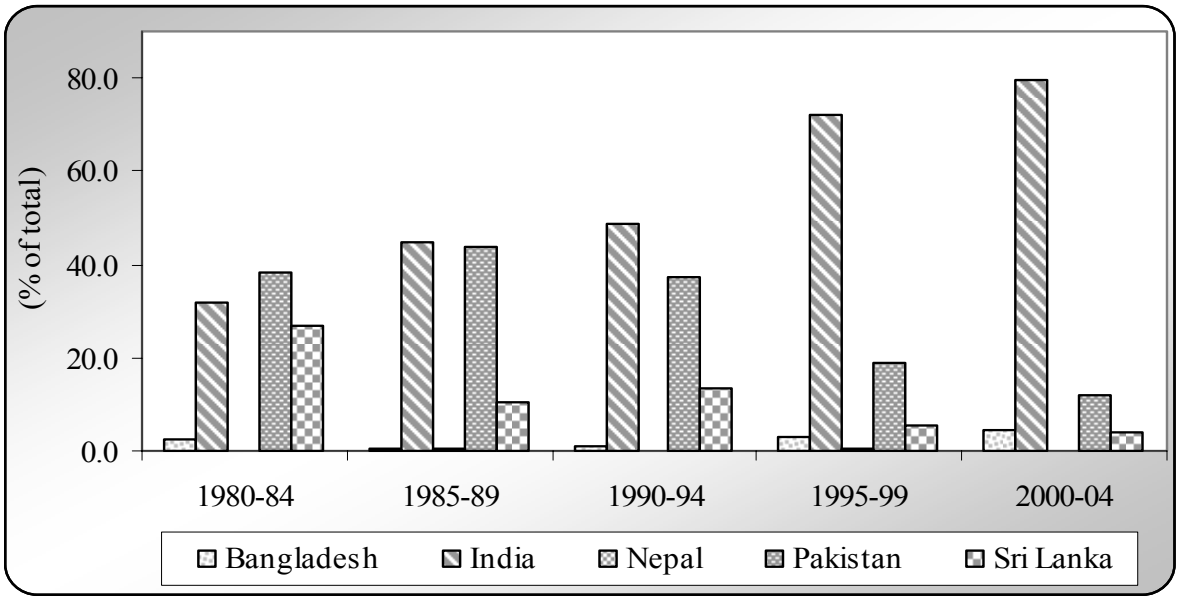
		Annual Rate of Growth of Real GDP		Annual Rate of Growth of Manufacturing		Annual FDI as percent of GDP		Trade as percent of GDP	
		1980-90	1991-04	1980-90	1991-03	1980-90	1991-04	1980-90	1991-04
A	*Selected Latin America Countries*								
	Argentina	-0.88	3.53	-1.96	2.07	0.71	2.40	15.19	24.22
	Brazil	2.32	2.50	0.80	1.23	0.62	2.44	17.50	21.82
	Chile	4.33	5.71	3.22	3.95	2.04	5.47	53.67	60.62
	Colombia	3.64	2.63	2.83	-0.72	1.29	2.44	28.87	37.88
	Mexico	2.55	2.96	2.58	2.99	1.14	2.51	30.21	53.47
	Peru	-0.15	3.85	-0.07	3.30	0.14	3.06	34.16	31.92
	Venezuela	0.44	1.69	1.24	-1.02	0.23	2.71	46.57	49.16
	Latin America and Caribbean (Average)	**1.62**	**2.88**	**0.99**	**1.83**	**0.79**	**2.64**	**28.56**	**39.06**
B	*Selected East Asian Countries*								
	Indonesia	6.62	4.33	13.34	6.02	0.42	0.25	47.93	61.42
	Malaysia	6.16	6.37	9.95	8.43	3.37	4.82	115.18	194.12
	Philippines	2.11	3.48	1.34	2.83	0.63	1.70	51.89	90.84
	Singapore	7.65	6.23	7.41	6.17	10.44	12.39	n.a.	n.a.
	Thailand	7.65	4.78	9.39	7.25	1.15	2.29	56.60	102.02
	S. Korea	7.81	5.74	n.a.	7.09	0.26	0.76	65.99	66.55
	Vietnam	4.63*	7.48	2.42**	11.08	0.48*	6.05	40.44**	96.55
	East Asia & the Pacific (Average)	**7.46**	**7.98**	**8.81**	**10.57**	**0.81**	**3.39**	**34.01**	**63.23**
C	*Selected South Asian Countries*								
	Bangladesh	3.46	4.95	4.67	6.76	0.01	0.23	19.27	29.30
	India	5.89	5.70	6.94	6.02	0.05	0.53	14.27	25.25
	Nepal	4.11	4.43	7.85	7.53	0.02	0.10	31.86	51.14
	Pakistan	6.65	4.01	8.40	4.58	0.36	0.85	34.91	36.19
	Sri Lanka	4.35	4.71	5.71	6.33	0.73	1.24	68.10	78.66
	South Asia (Average)	**5.68**	**5.39**	**6.90**	**5.87**	**0.09**	**0.56**	**18.65**	**28.66**

Source: World Development Indicators (WDI), World Bank (2006).

Note: 1. * Data are available for 1985-1990; 2. ** Data are available for 1986-1990; 3. n.a. = not available

Figure 1 provides an indication of the level of concentration of FDI in the South Asian countries, and clearly indicates that India was the most preferred FDI destination for foreign investors in South Asia since the 1990 reforms, with a sharp increase from 1994. The wide FDI inflows gap among countries provides a better understanding of factors accounting for the most favoured and the least favoured destinations. In comparison with all other South Asian countries, FDI inflows in India increased significantly and the FDI inflows gap with other countries also widened during 1980-2004. For example, the ratio of FDI inflows in India to FDI inflows in Nepal increased from 264.0 in 1980 to 533.5 in 2004, whereas with Sri Lanka, the ratio increased from 1.8 in 1980 to 22.9 in 2004.

Figure 1: FDI inflows in South Asian Countries: 1980-2004
(percent of total FDI inflows to South Asia)



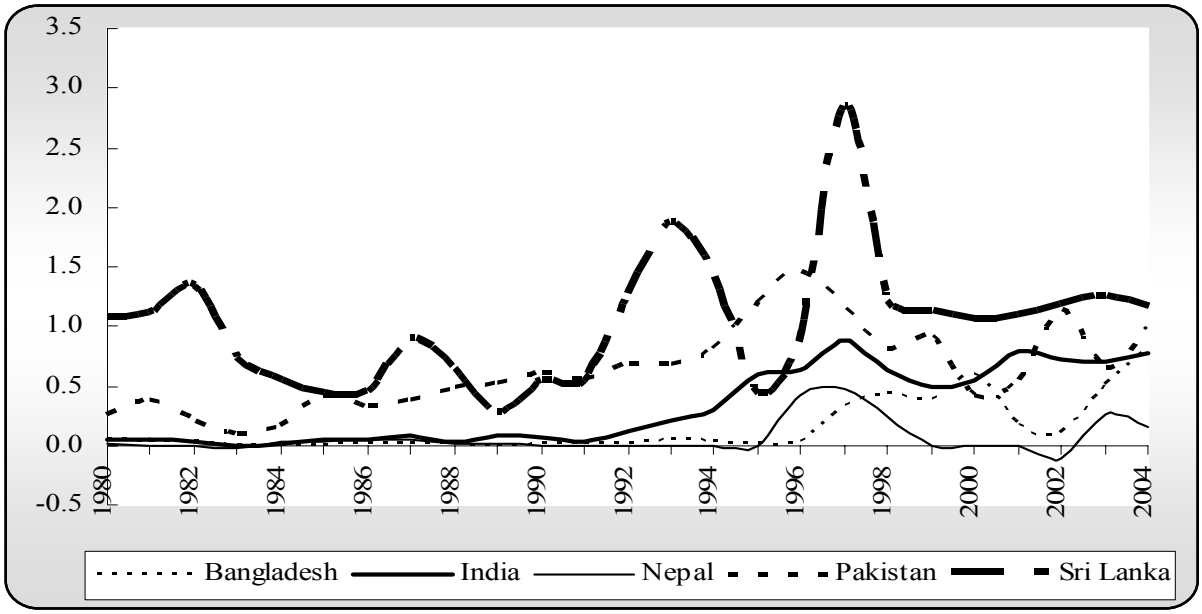
Source: World Development Indicator (WDI), 2006

The rapid increase in FDI inflows to South Asia is indicative of the improvement of business confidence in the region. In particular, the cross-border merger and acquisitions in India, especially in the electrical equipment, services and telecommunications sectors, the improvement in the investment environment and the privatization of assets in Pakistan and Bangladesh contributed largely to the recent FDI inflows in the region (Sahoo, 2006).

Probably the most systematic investment regime in South Asia exists in Bangladesh, mainly due to the active role of the Board of Investment in promoting and facilitating investment climate in the country (Sahoo, 2006). A noteworthy development of Bangladesh in receiving FDI is that it entered the first three FDI recipients of South Asia list for the first time during 2000-04 and became one of the most attractive destinations for foreign investment in the region. Among the FDI recipient sectors, the services sector has attracted the highest investment, especially the telecommunication industry, followed by IT and manufacturing sectors. However, in recent times, textiles and agro-based industries are receiving comparatively larger amount of FDI in Bangladesh.

In terms of FDI in relation to GDP, the historical analysis reveals that the share of FDI in GDP was the highest in Sri Lanka, followed by Pakistan during the last two and half decades. In Sri Lanka, the share of FDI was always more than 1 percentage of GDP since 1980, except for the late 1980s and the mid 1990s (Figure 2). This success in attracting FDI inflow was possible for various reform measures that have been implemented in Sri Lanka by the late 1970s. In contrast, FDI inflows in Pakistan, as percent of GDP increased significantly since the mid of 1980s and crossed the ratio of Sri Lanka in the late 1980s and the mid-1990s. FDI-to-GDP ratio in India, however, has been increasing since the beginning of 1990s due to a large volume of FDI inflows in India compared to other neighbouring countries. Between 1980 and 1991, FDI inflows were less than 0.1 percent of GDP in India, whereas it increased to 0.77 percent of GDP in 2004. On the other hand, Bangladesh had FDI-to-GDP ratio lower than 1.0 percent of GDP since 1980-1996 and it reached at 0.81 percent of GDP in 2004. In Nepal, FDI inflows crossed 0.1 percent of GDP only five times (1996-1998 and 2003-2004) during the period covered.

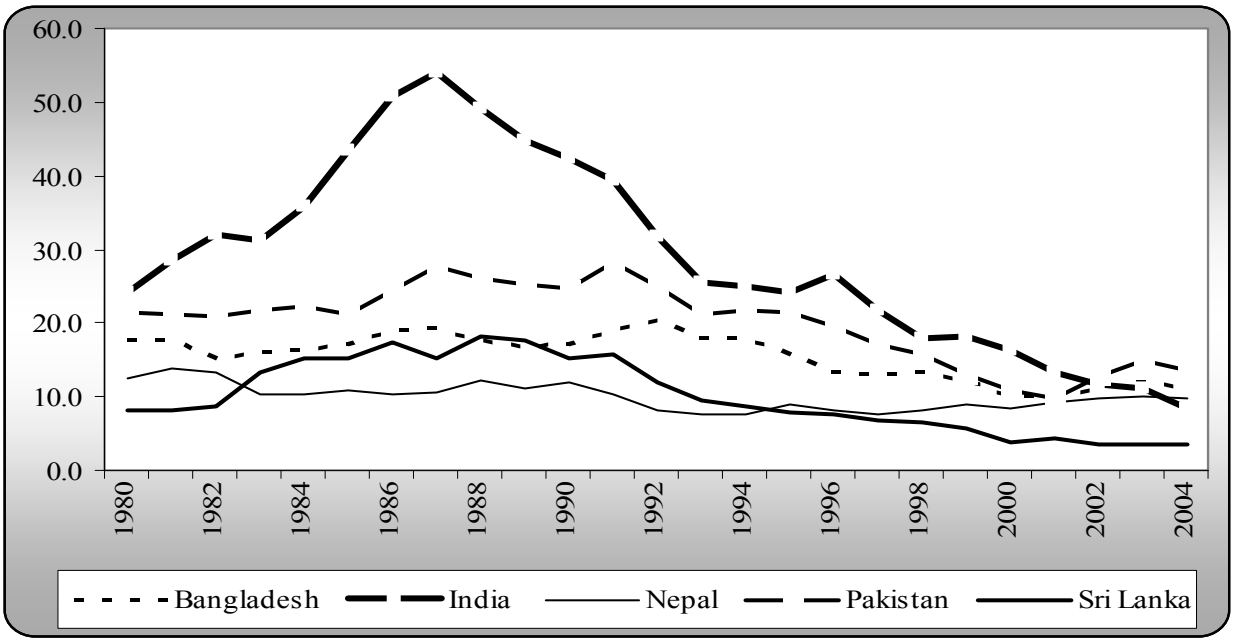
Figure 2: FDI as percentage of GDP in South Asian Countries: 1980-2004



Source: World Development Indicator (WDI) 2006

In respect of implicit tariff rate, import tax as percent of total import, a high level of implicit tariff rate is observed in almost all South Asian countries during the late 1980s from a low level of that in the early 1980s as depicted in Figure 3. However, the rate started to decline since the early 1990s. That is, the pace of trade liberalization in these countries received momentum especially since the beginning of 1990s. Among South Asian countries, India has been the most successful country in reducing implicit tariff rate (from 24.2 percent in 1980 to 8.3 percent in 2004) since 1980. However, Sri Lanka is the most liberalized country among all South Asian countries in terms of lower implicit tariff rate it contains throughout the period since 1980, except few years in the late 1980s and early 1990s. Bangladesh, Nepal and Pakistan were also successful in reducing the implicit tariff rate in the said period.

Figure 3: Implicit Tariff Rate in South Asian Countries: 1980-2004



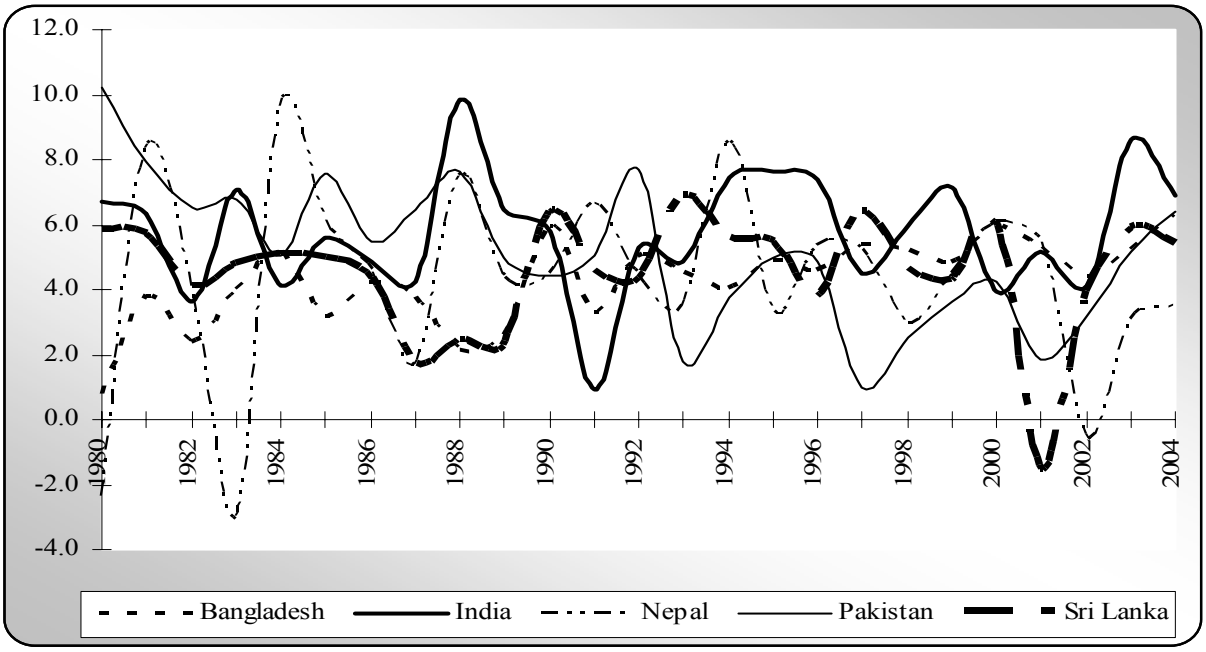
Source: World Development Indicator (WDI) 2006

The success of trade liberalization is reflected in the increased trade-GDP ratio in all South Asian countries. In particular, Sri Lanka has been successful in maintaining a high level of trade-GDP ratio (more than 70 percent of GDP) since 1980. It might be the reason that Sri Lanka initiated and followed liberalization steps earlier compared to its neighbours. Nepal, India and Bangladesh have successfully increased their trade-GDP ratio to an acceptable level.[13] However, among them, Nepal is maintaining the highest trade-GDP ratio in recent times, followed by Bangladesh and India. By contrast, trade-GDP ratio in Pakistan was fairly stagnant during the period 1980-2004, increasing from 36 percent in 1980 to 41 percent in 2004.

It is evident that the macroeconomic and trade related reform policies followed by the South Asian countries, especially since the mid-1980s, cumulatively helped these countries to experience a higher and consistent economic growth. It is clear from Figure 4 that GDP growth performance has varied across countries and time periods in South Asia. In general, except Pakistan, all the countries had experienced higher average growth rates in the nineties than that of the eighties. In particular, GDP growth rates in Bangladesh have consistently improved over the two and half decades. While India has maintained a higher GDP growth rate, the GDP growth rate in Sri Lanka and Nepal was highly volatile during this period.

[13] In particular, during 1980-2004 the trade-GDP ratio increased from 30 percent to 51 percent in Nepal, from 16 percent to 32 percent in India and from 23 percent to 36 percent in Bangladesh. Here, it needs to be mentioned that the pace of trade-GDP ratio in India and Bangladesh reflects the similar improvement pattern throughout the abovementioned period as depicted in Figure 3.

Figure 4: GDP Growth Rate in South Asian Countries: 1980-2004



Source: World Development Indicator (WDI) 2006

Tables A.3.1 to A.3.6 provide a detailed picture about the dynamics of changes that have occurred in FDI as percentage of GDP, GDP growth rate, literacy rate, index of openness (trade as percent of GDP), domestic investment as percent of GDP and labour force in South Asian countries during 1980-04 with 1980-84 being considered as the base period.

The main conclusions emerging from a review of the historical data are the following:

(i) Every country in South Asia was successful in attracting FDI over these periods (Table A.3.1). However, India was the most successful among all South Asian countries in attracting foreign investors, followed by Bangladesh and Nepal. Although changes in FDI as percent of GDP were lower in Pakistan and Sri Lanka, these economies enjoyed higher FDI/GDP ratio since the beginning of the period.

(ii) As the results show, the performance of Bangladesh was the most significant among neighbours in terms of GDP growth rate during 1980-2004 (Table A.3.2). The changes in GDP growth rate in India and Nepal were marginally positive, while changes in GDP growth rate in Sri Lanka and Pakistan were significantly negative over the years.

(iii) All South Asian countries were successful in improving literacy rate during the period of 1980-2004 (Table A.3.3). Nepal was the most successful in this case because of its lower base of the literacy rate, followed by Pakistan, India and Bangladesh. The changes in the literacy rate in Sri Lanka was the lowest among all South Asian countries, although the base literacy rate in Sri Lanka was almost like that of a developed country since the beginning of the said period.

(iv) Index of openness indicates that all countries in South Asia became highly open during the last two and half decades (Table A.3.4). In particular, Sri Lanka, India, Pakistan and Bangladesh have become more globally integrated as implicit tariff rate declined quite significantly in these countries during the trade liberalization period. Sri Lanka, the earliest

liberalized country in South Asia since the 1970s, experienced the most significant change in implicit tariff rate during the trade liberalization period because of its early trade liberalization steps, among others, at the beginning of 1980s.

(v) Bangladesh and Nepal were successful in pushing domestic investment along with the pace of foreign investment, although these two countries were the lowest recipients of FDI during 1980-2004 (Table A.3.5). The changes in domestic investment as percentage of GDP were the lowest in the three major FDI recipients (India, Pakistan and Sri Lanka) over the years. This might be an indication of the inverse relationship between FDI and domestic investment in the South Asian region.

(vi) Presently labour force in all South Asian countries is growing at a rate of over 2 percent which is significantly higher among developing countries. Over the years, the changes in the growth rate of labor force were negative in Bangladesh and Sri Lanka, although both countries enjoyed over 2 percent growth rate in the labour force during 1980-2004. India, Nepal and Pakistan successfully increased the growth rate of labour force.

IV. The Model and Methodology

In this section, a simple endogenous growth model has been used in which FDI and index of openness have been considered as the additional sources of growth in South Asian economies.

The effect of FDI on economic growth in South Asia during the trade liberalization period can be analyzed in the standard growth accounting or production function framework. This framework is used to control for the specific growth model variables contributing to output growth and also to examine the effects of trade liberalization on economic growth in South Asia. In the standard growth model, FDI inflows could promote GDP growth, on the one hand, by providing additional employment in a labor surplus economy and by improving the technological knowledge and human capital, on the other (Agrawal 2000).[14]

Specifying domestic and foreign owned capital stock separately in the Cobb-Douglas production function, the empirical investigation will be based on the following equation:

$$Y_t = A_{it} K_{dit}^{\alpha} K_{fit}^{\lambda} L_{it}^{\beta} H_{it}^{\gamma} O_{it}^{\varphi} \qquad (1)$$

where, Y is the flow of output, $K_{d,} K_f$ represent domestic and foreign owned capital stock respectively, L is the total labour force of the respective country, H is the human skills capital stock, and O is a measure of trade liberalization. A is the total factor productivity (TFP) explaining the output growth that is not accounted for by the growth in factors of production specified.

Taking logarithmic transformation and differentiating both sides of Equation (1) with respect to time, we obtain

[14] However, there is a different consensus on this view in the sense that foreign capital inflows could lead to immiserizing growth when such flows earn excessive profits in the host country due to various trade and financial distortions (Brecher and Diaz-Alejandro, 1977 and Agrawal, 2000).

$$y_{it} = a_i + \alpha k_{dit} + \lambda k_{fit} + \beta l_{it} + \gamma h_{it} + \varphi o_{it} \quad (2)$$

where, the lower case variables correspond to the growth rate of the uppercase variables. As it follows from equation (2), the growth rate of output is decomposed into the growth of TFP, and a weighted average of the growth rates of domestic and foreign capital stock, labor, human capital and index of openness. The lower case letters represent the growth rate of output, domestic capital stock, foreign capital stock, labor, human capital and index of openness. $\alpha, \lambda, \beta, \gamma, and \varphi$ represent the output elasticity of domestic capital stock, foreign capital stock, labor, human skill capital and trade liberalization index respectively.

The final form of Equation (2) can be written as follows:

$$y_{it} = a_i + \alpha I_{dit} + \lambda I_{fit} + \beta l_{it} + \gamma h_{it} + \varphi o_{it} + \varepsilon_{it} \quad (3)$$

where, y_{it} is the growth rate of real GDP, I_{it} is the domestic investment to GDP ratio, that has been considered as proxy of domestic capital, I_{it} is the foreign direct investment to GDP ratio as a proxy of foreign capital, l_{it} is the growth rate of total labour force, h_{it} is the adult literacy rate, o_{it} is the ratio of export and import to GDP and finally the stochastic error is denoted by ε_{it}.

Two estimation methods have been used in the study to investigate the relationship between economic growth, FDI and trade liberalization in the context of South Asia, namely the OLS with White's heteroskedasticity consistent covariance estimation, panel data estimation with fixed effects. One can argue about the use of random effect model in this regard. The random effect model is appropriate if one uses a larger sample including any country at random (Matyas, 1997 and Matyas, 1998). But countries have not been chosen randomly in this study which includes only five countries from South Asia, indicating that fixed effect model is appropriate. In addition, fixed effects model is appropriate when one has relatively small number of countries and large number of observations for each country. However, one can perform Hausman test to investigate whether random effect model is appropriate or not. Hausman test (1978) that has been employed to select the appropriate model between random effect model and fixed effect model for the estimation, strongly favors the fixed effect model in the estimation process. Thus, the regression has been estimated using country specific fixed effects which capture the effects of country specific unobserved variables.

South Asia region experienced comparatively very low FDI inflow since 1980s so that using data from 1980 might give unexpected results to test the relationship between FDI and growth. Therefore we have also estimated the regressions separately for the periods 1985-2004 along with the period of 1980-2004 to observe the differential effect of FDI on economic growth in different periods.

In order to investigate further the country-specific relationship between 'FDI and growth' and between 'trade liberalization and growth', Granger causality test (Granger 1969) has been employed under a bivariate VAR framework. This test is used to resolve the possible causality

bias between 'FDI and growth' and 'trade liberalization and growth.'[15] The Granger approach for causality takes into account the effect of lagged values of the causing variable on the current value of the dependent variable which systematically makes a nature of dynamic model in Granger approach (Kumar and Pradhan 2002).

According to this test the question of whether a variable, say I_f, causes another variable, say y, is seen by how the current y can be explained by past values of y and then is seen whether lagged values of I_f can improve the explanation. y is said to be Granger-caused by I_f if x helps in the prediction by y or in other words, the coefficients of the lagged I_f's are statistically significant. It is to be noted here that the two-way causation is frequently the case: I_f Granger causes y and y Granger causes I_f. A bivariate regression takes the following form:

$$y_{it} = a_0 + a_1 y_{it-1} + a_2 y_{it-2} + ... + a_l y_{it-l} + b_1 I_{fit-1} + b_2 I_{fit-2} + ... + b_l I_{fit-l} + e_t \quad (4)$$

$$I_{fit} = a_0 + a_1 I_{fit-1} + a_2 I_{fit-2} + ... + a_l I_{fit-l} + b_1 y_{it-1} + b_2 y_{it-2} + ... + b_l y_{it-l} + u_t \quad (5)$$

where *l* is the lag length and e_t and u_t are error terms.

In equation (4) null hypothesis is that x does not Granger-cause y and in equation (5) the null hypothesis is that y does not Granger-cause x. In other words, the null hypothesis is that:

$$b_1 = b_2 = ... = b_l = 0$$

Theoretically, FDI can either encourage more domestic investment through vertical linkages, or through positive knowledge spillovers to the domestic industries, or crowd-out domestic investment due to its larger economies of scale. Thus, effect of FDI and economic growth on the domestic investment contains a dynamic dimension.

In order to study the impact of FDI on domestic investment, a dynamic version of the linear model for investment is estimated in which the current values of domestic investment are made a function of two lags of the dependent variable, current and past values of FDI and lagged GDP growth variable. Arellano-Bond GMM dynamic model (Arellano and Bond, 1991) is used to capture the possible dynamic interrelationships between FDI inflows and domestic investment. The conventional estimation techniques for panel data namely, OLS and fixed effect, are likely to lead to biased and inconsistent estimates if domestic investment and FDI are simultaneously determined or the specification might suffer from potential endogeneity of all explanatory variables included in the model.[16] The primary advantage of using GMM is that it uses

[15] However, Chowdhury and Mavrotas (2006) argued that although Granger test can yield valuable information in terms of time patterns, it focuses only on time-precedence rather than causality in the usual sense. In addition, using Granger approach it is possible to make incorrect inferences about causality due to the sensitivity of stationarity or cointegration tests. In this circumstance, they suggest to use the methodology of Toda and Yamamoto (1995) for testing causality which avoids the problems associated with Granger test as mentioned above (See Giles 1997; Mavrotas and Kelly 2001 for details).

[16] For instance, see, Kumar and Pradhan (2002); Townsend (2003) and Basu and Guariglia (2003).

instrumental variables to correct possible endogeneity of explanatory variables (See, for instance, Carkovic and Levine, 2002 and Townsend, 2003). As described by Kumar and Pradhan (2002), the Arellano-Bond estimation techniques are based on one-step and two-step generalized GMM framework that utilizes the orthogonality conditions that exist between the lagged values of dependent variable and the disturbances. More specifically, this method takes into consideration the first difference of the model to eliminate the individual effects and then estimates the regression using two or higher period lagged dependent variables as instruments. Therefore the study uses the Arellano-Bond GMM dynamic model with other conventional estimation techniques.[17] Here, the impact of FDI on domestic investment is examined by estimating the following equation:

$$I_{dit} = \alpha_0 + \alpha_1 I_{dit-1} + \alpha_2 I_{dit-2} + \alpha_3 I_{fit} + \alpha_4 I_{fit-1} + \alpha_5 I_{fit-2} + \alpha_6 y_{it-1} + \varepsilon_{it} \qquad (6)$$

where, I_d and I_f are the domestic investment as percent of GDP and foreign investment as percent of GDP, respectively, and y_{it-1} is the lagged value GDP growth.

The fixed effects model and the Arellano-Bond GMM method have followed for panel data estimation of five South Asian countries. In addition, the country-wise OLS estimations have been preformed to examine the country-wise effect of FDI on domestic investment and to observe inter-country differences in attracting FDI as each country has their own ability to attract FDI of better quality given their respective infrastructure superiority.

V. Data and Empirical Evidence

In order to investigate the relationship between FDI and growth of South Asian countries, the time series data was collected on the five South Asian countries for the period 1980-2004.[18] The data on growth rate of GDP, gross domestic investment rate, FDI to GDP ratio, labour force, adult literacy rate, trade (exports plus imports) as percent of GDP, M2/GDP ratio and inflation rate are obtained from the *World Development Indicators 2006* (CD-ROM), the World Bank. Domestic investment is obtained by subtracting FDI to GDP ratio from gross investment as percent of GDP. Controversy remains in the empirical growth literature as regards the appropriate variable that is needed to be used as the proxy of the labour input. The previous studies considered different indicators such as the total employment of a country or total population size as the proxy of the labor force in the growth models.[19] However, the time series data on the employment level are not available for these countries. Furthermore, population size did not seem a good measure of employment level to some researchers, especially when growth models are considered for empirical investigations. Similarly, measurement of human capital stock is different in studies as literacy rates, gross enrolment rates or measures of educational

[17] In this regard, Anderson and Hsiao (1982) suggested to use an instrumental variable (IV) methods for estimation of dynamic data models; however even though the IV estimates are consistent, they are not efficient for not utilizing all the available moment conditions as noted in Kumar and Pradhan (2002).

[18] The five South Asian Countries, which have considered for this study, are Bangladesh, India, Nepal, Pakistan and Sri Lanka respectively. Countries have been selected on the basis of data availability, volume of FDI inflows to the respective countries. In general, these five countries absorb most of the FDI inflows in South Asia (almost 99 percent of total FDI inflows).

[19] See, for example, Medina and Smith (2001); Ram (1987); Van den Berg and Schmidt (1994).

attainment (such as Barro-Lee data set for educational attainment) are used extensively in literature. In this study, annual literacy rate has been used to capture the effect of human capital on overall growth process. The ratio of M2 to GDP is considered to observe the financial deepening of these economies and whether that has any impact on the growth process of these countries. The inflation rate is used in the growth model to observe whether the debate regarding the negative relationship holds for South Asian countries.

FDI, Economic Growth and Trade Liberalization

The estimation results of the growth model for South Asian countries are presented in Table 2 and 3. As explained earlier, a number of panel regression equations have been estimated by considering all combination of variables and two time periods. The results show a significant contribution of foreign direct investment and gross capital formation to the growth of South Asian countries. In particular, the role of FDI in promoting growth in South Asian countries is evident from this result. The coefficient of FDI is ranging from 0.78 to 1.19 indicating that a one percent increase in the FDI to GDP ratio leads to an increase in the growth rate of GDP by 0.78 percent to 1.96 percent. It is also observed that the impact of FDI is higher than the impact of domestic investment on the growth of South Asian economies. The results suggest that a one percent increase in the domestic investment to GDP ratio leads to an increase in the growth of GDP by 0.12 to 0.24 percent.

Table 2: FDI, Trade Liberalization and Economic Growth in South Asian Countries, 1980-2004

Independent	*OLS Regressions*				*Fixed Effects Regressions*		
Variables	*2.1*	*2.2*	*2.3*	*2.4*	*2.5*	*2.6*	*2.7*
Literacy Ratio	-0.03* (-2.19)	-0.03* (-2.13)	-0.02** (-1.75)	-0.03** (-1.94)	-0.119* (-2.08)	-0.116* (-1.98)	-0.166* (-2.26)
Growth of Labour	0.007* (7.20)	0.006* (6.36)	0.006* (4.79)	0.006* (3.57)	---	0.003 (1.29)	---
FDI	0.896* (2.19)	1.154* (2.64)	0.86** (1.82)	1.13* (2.58)	0.885** (1.67)	0.882** (1.68)	0.619 (1.13)
Domestic Investment	0.166* (2.04)	0.17* (3.34)	0.148* (2.76)	0.174* (3.27)	0.228* (3.31)	0.235* (3.25)	0.215* (2.68)
Trade Liberalization	---	0.046* (2.03)	0.038** (1.72)	0.047* (2.12)	---	---	-0.03 (-0.82)
M2/GDP	---	---	0.029 (1.49)	---	---	---	---
Inflation	---	---	---	-0.063 (-1.39)	-0.103* (-1.99)	-0.09** (-1.90)	-0.088* (-1.51)
Constant	2.349* (2.44)	1.33 (1.23)	0.86 (0.72)	1.67 (1.59)	6.447* (1.96)	6.13** (1.73)	7.87* (2.00)
F-value	24.8	16.23	6.82	4.75	4.39	3.82	4.50
R-squared	0.06	0.10	0.11	0.11	0.11	0.11	0.13
No. of observations	125	125	125	125	125	125	125

Notes: Figures in parentheses are t-ratios; * and ** indicate 5 percent and 10 percent level of significance respectively. Estimated using statistical package STATA 9.2.
Source: Author's computations

The implicit tariff rate, an indicator of trade liberalization, turns out to be positive and significant in the OLS regressions, but is not significant in the fixed effect model. Thus there is a weak

support for concluding that trade liberalization has a positive role to growth of South Asian countries. Though the coefficients of labour force growth are positive and significant in regressions for the period of 1980-2004, they are negative and significant in regressions for the period 1985-2004. This might be the case that labour skills are not improving corresponding with the pace of FDI inflow and growth in GDP among South Asian economies. Moreover, it needs to be considered that all South Asian countries have unskilled labour surpluses. The literacy ratio, proxied for human capital, turns out to be negative throughout the regression results, indicating that a comparatively lower literacy rate could explain the slower growth process in this region.

Table 3: FDI, Trade Liberalization and Economic Growth in South Asian Countries, 1985-2004

Independent	*OLS Regressions*				*Fixed Effects Regressions*		
Variables	*3.1*	*3.2*	*3.3*	*3.4*	*3.5*	*3.6*	*3.7*
Literacy Ratio	-0.037* (-2.98)	-0.03* (-2.20)	-0.03* (-1.97)	-0.03* (-2.78)	-0.13* (-2.34)	-0.14** (-1.90)	-0.09 (-1.43)
Growth of Labour	-1.47** (-1.79)	---	---	-1.69* (-2.06)	---	-1.40 (-1.37)	-1.23 (-1.23)
FDI	1.303* (2.99)	1.12* (2.67)	0.95* (2.11)	1.53* (3.33)	1.192* (2.50)	0.78** (1.72)	0.1.02* (2.33)
Domestic Investment	0.127** (1.74)	0.20* (3.58)	0.19* (3.18)	0.12** (1.74)	0.219* (3.12)	0.24* (2.23)	0.19* (2.18)
Trade Liberalization	---	0.04** (1.72)	0.03** (1.67)	0.04** (1.69)	---	-0.05 (-1.33)	---
M2/GDP	---	---	0.02 (0.79)	---	---	---	0.03 (0.66)
Inflation	---	---	---	-0.086 (-1.61)	-0.08 (-1.30)	---	---
Constant	6.667* (2.26)	0.50 (0.44)	0.50 (0.44)	7.17* (2.29)	6.79* (2.30)	9.11* (2.21)	6.81* (2.15)
F-value	6.08	4.74	4.74	4.75	4.83	3.94	3.84
R-squared	0.13	0.14	0.14	0.18	0.14	0.15	0.14
No. of observations	100	100	100	100	100	100	100

Notes: Figures in parentheses are t-ratios; * and ** indicate 5 percent and 10 percent level of significance respectively. Estimated using statistical package STATA 9.2.
Source: Author's computations

The coefficients of M2 to GDP ratio, an indicator of financial deepening, are not significantly different from 0. However, the coefficients of inflation rate are negative and significant in the fixed effect estimations for the period of 1980-2004, but not significant otherwise.

On the whole, the panel data estimations highlight the fact that FDI has a positive and significant impact on growth for five South Asian economies with a positive and significant impact of domestic investment on economic growth. There is a weak support to the hypothesis that trade liberalization is supportive of the growth of these countries. However, the results from panel data estimations may suffer from limitations, and thus need to be analysed with caution. It is quite usual that the impact of FDI on growth and the causation between FDI and growth vary among countries due to the effect of other factors such as domestic investment and knowledge

spillovers.[20] Moreover, causation between trade liberalization and growth process may also be observed if country-specific study can be considered. Thus a causality analysis has been performed for each country using time series data.

Direction of Granger Causality

The Granger causality tests have been performed in a bivariate vector autoregressions (VAR) framework and the results are reported in Table 4. The Schwartz Information Criterion (SC) has been used to determine the optimal lag length in the test. A one-way causality is found for Bangladesh and Pakistan between FDI and growth. For both countries, FDI leads to GDP growth. However, the direction of causality is not clear in the cases of India, Nepal and Sri Lanka and thus the Granger test is not able to determine the direction of causality.

Table 4: Granger Causality between FDI and Economic Growth and between Trade Liberalization and Economic Growth: 1980-2004

Country	Null Hypothesis*	Obs	Number of lags	F-statistic	Probability	Conclusion
Bangladesh	FDI dngc Growth	24	1	5.58436	0.02784	FDI→Growth
	Growth dngc FDI	24	1	0.02407	0.87818	
	TL dngc Growth	24	1	6.63494	0.01762	TL→Growth
	Growth dngc TL	24	1	0.53141	0.47407	
India	FDI dngc Growth	21	4	1.74481	0.20485	Granger Neutral
	Growth dngc FDI	21	4	1.21863	0.35349	
	TL dngc Growth	22	3	0.54081	0.66164	Granger Neutral
	Growth dngc TL	22	3	0.55297	0.65396	
Nepal	FDI dngc Growth	24	1	0.02350	0.87963	Granger Neutral
	Growth dngc FDI	24	1	0.92217	0.34783	
	TL dngc Growth	24	1	0.57225	0.45777	Granger Neutral
	Growth dngc TL	24	1	1.25017	0.27615	
Pakistan	FDI dngc Growth	24	1	5.08645	0.03491	FDI→Growth
	Growth dngc FDI	24	1	1.60161	0.21954	
	TL dngc Growth	24	2	14.0065	0.00021	TL→Growth
	Growth dngc TL	24	2	1.67485	0.21524	
Sri Lanka	FDI dngc Growth	20	5	1.73899	0.22173	Granger Neutral
	Growth dngc FDI	20	5	2.35699	0.12467	
	TL dngc Growth	24	1	0.08280	0.77636	Granger Neutral
	Growth dngc TL	24	1	0.00354	0.95311	

Notes: * dngc stands for 'does not Granger cause'

The Granger causality tests between trade liberalization and GDP growth postulates the same results as it has been in the case of FDI and GDP growth. That is, in the cases of Bangladesh and Pakistan, trade to GDP ratio, as the indicator of trade liberalization, leads to GDP growth, whereas the direction of causality is not pronounced in the cases of India, Nepal and Sri Lanka. Since the direction of causality in majority of countries could not be determined by the Granger causality, the interpretation of results of panel estimation requires caution.

[20] See, for instance, Fry (1992) and De Mello (1999) as mentioned in Kumar and Pradhan (2002).

FDI and Domestic Investment: Complements or Substitutes?

Due to the expected backward and forward linkages between FDI and local industries, FDI can either crowd-in domestic investment by transferring technologies and knowledge to domestic firms or crowd-out domestic investment due to larger economies of scale and better managerial skills. These characteristics of FDI open the door for the discussion of the dynamic effect of FDI on domestic investment. The results of the investment functions suggested by model (6) using panel fixed effect as well as Arellano-Bond GMM dynamic estimation are reported in Table 5. The estimated models are found to be significant in terms of all diagnosis statistics. The Sargan test from the two-step estimator cannot reject the null hypothesis that the over-identifying restrictions are valid. And it also cannot reject the null hypothesis of no second-order autocorrelation, suggesting the consistency of the obtained estimates.

Table 5: Effect of FDI on Domestic Investment: 1980-2004

Independent Variables	*Fixed Effect Estimations*		*Arellano-Bond GMM Dynamic Panel Data Estimations*	
	5.1	*5.2*	*5.3*	*5.4*
Domestic Investment$_{t-1}$	0.621*	0.619*	0.371*	0.454*
	(8.23)	(8.21)	(4.09)	(3.82)
Domestic Investment$_{t-2}$	---	---	---	-0.025
				(-0.21)
FDI	---	0.109	0.600	0.733
		(0.21)	(1.11)	(1.16)
FDI $_{t-1}$	0.624*	0.565	0.822**	0.847**
	(2.36)	(1.47)	(1.67)	(1.64)
GRGDP	0.151**	0.149**	0.102	0.092
	(1.83)	(1.78)	(1.39)	(1.15)
GRGDP $_{t-1}$	0.169*	0.171*	---	---
	(2.16)	(2.17)		
Constant	6.189*	6.18*	.008	0.004
	(4.18)	(4.17)	(0.31)	(0.13)
F-value	26.03	20.79	---	---
R-squared	0.74	0.74	---	---
Sargan Test	---	---	79.16	44.52
Serial Correlation of 1st order			-4.19	-5.69
Serial Correlation of 2nd order			0.38	1.12
No. of Observations	120	120	115	110

Notes: Figures in parentheses are t-ratios; * and ** indicate 5 percent and 10 percent level of significance respectively. Estimated using statistical package STATA 9.2.
Source: Author's computations

It is evident that FDI inflows and domestic investment in the past one year have significant effect on the domestic investment in the current year. In both cases, the signs are positive implying a dynamic positive effect of FDI and domestic investment on the current year's domestic investment. The significant coefficients of FDI lagged one year range from 1.08 to 0.62 implying that a one percent increase in FDI to GDP in the last year leads to an increase of 1.08 to 0.62 percentage points in domestic investment as a share of GDP in the current period. Similarly, the coefficients of domestic lagged one year range from 0.62 to 0.37 implying that a one percent increase in the domestic investment as share of GDP in the previous year leads to an increase of

0.62 to 0.37 percentage points in domestic investment as share of GDP in the current period. Though the signs of FDI inflow are positive for the current period, but are not significant. The signs of the growth rate of GDP in the current period and the last period are positive and highly significant in the fixed effect estimations, but not significant in the Arellano-Bond GMM Dynamic estimations. Thus, FDI has a dynamic effect on the domestic investment in the context of South Asian countries, but FDI in the current period does not affect the domestic investment contemporaneously.

Though the panel analysis reveals that FDI crowds-in domestic investment in South Asian economies, there may be differences in results if inter-country analysis is considered. Table 6 provides the findings from the re-estimations of equation (6) for each country.

Table 6: FDI and Domestic Investment Relationship for South Asian Countries: 1980-2004

Independent Variables	*Dependent variable: Domestic Investment*				
	Bangladesh	*India*	*Nepal*	*Pakistan*	*Sri Lanka*
Domestic Investment$_{t-1}$	0.82*	0.04	0.44*	0.75*	0.51*
	(7.99)	(0.25)	(1.97)	(5.67)	(4.29)
Domestic Investment$_{t-2}$	---	---	0.42*	---	---
			(1.97)		
FDI	---	3.25	6.18**	0.40	-0.59
		(1.42)	(3.56)	(0.49)	(-0.84)
FDI $_{t-1}$	2.17**	-4.16**	-7.64*	---	1.35*
	(1.67)	(2.37)	(-2.08)		(1.98)
GRGDP	0.06	0.25**	---	---	0.42*
	(0.36)	(1.73)			(2.04)
GRGDP $_{t-1}$	---	---	0.15	0.21	---
			(1.05)	(1.49)	
Constant	3.12**	20.22*	2.86	2.98	8.89*
	(1.88)	(4.95)	(0.63)	(1.28)	(2.87)
Adjusted R-squared	0.91	0.78	0.55	0.67	0.51
F-value	80.04	14.9	6.35	16.41	6.91
D-W statistic	1.68	1.98	1.99	1.94	1.98
No. of Observations	24	24	23	24	24

Notes: Figures in parentheses are t-ratios; * and ** indicate 5 percent and 10 percent level of significance respectively. Estimated using statistical package STATA 9.2.
Source: Author's computations

The inter-country analysis reveals that the effects of FDI on domestic investment vary among countries. For example, FDI/GDP ratio in the last period has a positive and significant effect on the domestic investment as percent of GDP in the current period in the context of Bangladesh and Sri Lanka. In case of Bangladesh, Nepal, Pakistan and Sri Lanka, domestic investment as percent of GDP in the last period has a positive and significant effect on the domestic investment of the current year. On the other hand, the ratio of FDI to GDP in the last period has a negative and significant effect on the ratio of domestic investment to GDP ratio in the current period in the case of India and Nepal. However, in the case of Nepal, domestic investment as percent of GDP with a two-period lag and the ratio of FDI to GDP in the current period has a significant and positive effect on the domestic investment as percent of GDP in the current period. These results appear to be consistent with the observation of Kumar and Pradhan (2002), which justifies the results of the study.

VI. Concluding Remarks and Policy Implications

The purpose of this paper had been to find out possible impacts of FDI and trade liberalization on the growth process in the case of South Asian countries during the period 1980-2004. The paper also tried to examine the direction of causality among FDI, trade liberalization and economic growth using country-specific data over the same period. Finally, the paper observed the effect of FDI on domestic investment in South Asian economies using both cross-country and country specific data. In this regard, the paper initially explained the linkages of FDI and trade liberalization to growth from the theoretical perspectives and mentioned the results of other empirical evidences considering both cross-country and country-specific studies. In the examining process, the paper, first, explained the historical trends of FDI, trade-GDP ratio and economic growth of South Asian countries and compared those with that of other regions of the world. It is observed that although South Asia, as a region, received comparatively lower FDI than its counterparts such as Latin America and East Asia, it maintained a high economic growth and a considerable trade/GDP ratio since 1980. Among South Asian countries, India and Pakistan were the most favoured destinations for FDI, followed by Sri Lanka and Bangladesh. Sri Lanka was the most liberalized country in South Asia in term of trade-GDP ratio, followed by Nepal and Pakistan; however, Bangladesh and India improved significantly in this regard, particularly from the beginning of 1990s. Except Pakistan, all countries had experienced higher average growth rates in the nineties than that of the eighties.

The empirical evidences of the abovementioned investigations have been established using both panel data estimation and country-specific time series analysis for the period 1980-2004. The major findings that emerge from the analysis are as follows:

- The empirical findings from the panel data estimations highlight the fact that FDI has a positive and significant impact on growth for South Asian economies with a positive and significant impact of domestic investment on economic growth as well. The findings of this paper justify various investment incentives given to foreign investors by the South Asian countries over the years and suggest continuation of the existing efforts in encouraging more FDI inflows to the region.
- Though the impact of trade liberalization on growth in the case of South Asian countries is positive, but weak, as evident from the results. However, the lack of appropriate indicator for trade liberalization might be the reason for getting weak support about the positive relationship between trade liberalization and growth.
- FDI and trade liberalization lead to GDP growth in the cases of Bangladesh and Pakistan as suggested by the Granger causality tests. The direction of causality is not pronounced in the case of other countries. Thus the findings of this paper in regard to the direction of causality need to be used with caution.
- It is evident that FDI inflows in the past one year have a significantly positive impact on the domestic investment in the current year suggesting a dynamic effect of FDI on domestic investment. The results also reveal that FDI actually crowds-in domestic investment in the cases of South Asian economies, and domestic investment of the previous year has a significantly positive impact on the current year's domestic investment. This clearly suggests that FDI is supportive of domestic investment in South Asia and thus there is needed to encourage more FDI inflows in the region.

- However, the country-specific analysis reveals that FDI crowds-in domestic investment in the cases of Bangladesh and Sri Lanka, whereas it crowds-out domestic investment in the cases of India and Nepal. Nevertheless, domestic investment in the previous period has a significantly positive impact of the domestic investment of the current year in cases of all South Asian countries except India.

Bangladesh appears to harbour the most systematic foreign investment regime in South Asia, especially since the beginning of 1990s, due to various facilitating steps taken to attract FDI. Since the mid-1980s, Bangladesh was one of the frontrunners in implementing trade related reforms and measures in this regard which included a significant decline in quantitative restrictions, opening up of trade in many restricted items, rationalization of import tariffs, and liberalization of the foreign exchange regime.[21] As a result, Bangladesh has been successful in maintaining a considerable level of economic growth over the years. The results of this study also reflect the outcomes of the abovementioned reform measures. The results clearly indicate that FDI and trade liberalization causes economic growth in the perspective of Bangladesh. It is also found that FDI has a dynamic and positive impact on the domestic investment of Bangladesh with positive and dynamic impact of domestic investment itself. Thus the respective authorities ought to put efforts in encouraging more FDI inflows to Bangladesh and review the existing policies in liberalizing trade.

The findings of this study should be viewed with caution since it suffers from several limitations that might usefully be addressed in future investigations. First, the paper has not been successful in getting a strong result about the relationship between trade liberalization and GDP growth. The weak outcomes in this regard might be a result of using inappropriate indicator of trade liberalization, since serious measurement problems are associated with the indicators of trade policy used in cross-country studies (Weerasinghe 1999). In view of the problems associated with measurement of trade policy openness, future studies may get more appropriate results considering other indicators of openness such as black market premium (BMP), Sachs and Warner Index (SWI) and Leamer index for further investigations. Second, a more concrete result about the relationship among FDI, trade liberalization and economic growth can be found if the impact of FDI and trade liberalization on output growth can be shown through its major components, namely capital accumulation and total factor productivity growth.

[21] See, for details, Razzaque *et al.* (2003:2) and Bhattacharya *et al.* (2006).

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Appendix

A1. Variable Managements and Data Sources

Data Source

The data on GDP growth rate (annual %), Gross Fixed Capital Formation as domestic investment net of FDI (% of GDP), net FDI inflows (% of GDP), total labour force, literacy rate (annual %), trade (export plus import as % of GDP), money supply (M2 as % of GDP) and inflation (annual %) has been obtained from World Development Indicators 2006 (CD-ROM), World Bank.

Variable Measurements

$\mathbf{Y_{it}}$ is the growth rate of real GDP (annual %)

Domestic Investment$_{it}$ is the domestic investment as percent of GDP which is obtained as the difference between the total investment as percent of GDP and FDI as percent of GDP of the respective country.

FDI$_{it}$ is the FDI as percent of GDP which is defined as the net FDI inflows as a percentage of GDP of the host country.

Literacy ratio$_{it}$ is the literacy rate (annual %) which is used as the proxy of human capital stock.

Growth of Labour$_{it}$ is the growth rate of labor force (annual %).

Trade liberalization$_{it}$ is used as the trade liberalization index which is defined as the import tax as percent of total import.

M2/GDP$_{it}$ is the broad money supply as percent of GDP which is used as the indicator of financial deepening of an economy.

Inflation$_{it}$ is the inflation rate (annual %)

Sample Coverage

The sample covers 5 countries in South Asia, namely Bangladesh, India, Nepal, Pakistan and Sri Lanka. The sample size is 125 which covered period 1980-2004 for each country.

A2. Country-wise Major Liberalization Issues in South Asia

Country	*Bangladesh*	*India*	*Nepal*	*Pakistan*	*Sri Lanka*
1. FDI Policy Reforms	In the late 1980s and the 1990s, FDI is encouraged in industrial activities except arms and ammunitions; production of nuclear energy; security printing and minting; forestry in reserved forest areas; and railways. Investments may be undertaken either independently or through joint venture, either with the local, private or public sector. Foreign investors are provided with some incentives like tax exemptions for power generation and tax holidays for different industries. No import duty is charged in the case of capital machinery and spares for 100% export oriented industries.	FDI is permitted in every sector except arms and ammunitions; defense aircrafts and warships; atomic energy and railways. Tax holidays are offered in Special Economic Zones set up to make industry globally competitive. Special tax treatment and holidays are enjoyed by Infrastructure Sector Projects. Foreign nations are generally taxed only on their Indian Income. Incentives for R&D measures are also provided to foreign investors by central govt. All foreign investors are freely repatriable except for cases for cases where NRIs choose to invest specifically under non-repatriable schemes. For certain sectors, foreign equity is allowed up to 100%.	A clear-cut policy towards FDI was introduced in the 1980s. FDI is allowed in most of the sectors except cottage industries; personal business services; arms & ammunitions and consultative services. Incentives are given to industries that are set up for export purposes. These include income tax exemption on export income, exemption on foreign investor's interest income earned abroad, and a relaxation of taxes on specific industries. Foreign equity was allowed up to 100% for large industries exporting more than 90% of total production.	Liberalization of FDI in Pakistan began in the end of 1980s. At present, FDI is opened up to sectors like services and agriculture, which constitute three fourth of GNP. The restricted sectors for FDI are arms & ammunitions; high explosives; radioactive substances; security printing currency & mint; and new units of alcohol manufacturing except industrial alcohol. Foreign investors are allowed to hold up to 100 % equity of industrial projects without any permission from the government except the restricted sectors. Attractive tariff and tax incentives have been given to foreign investors since 1997.	The notable feature of FDI policy measure in Sri Lanka was the establishment of the Board of Investment with wide powers of tax relief and administrative discretion in all maters related to FDI. FDI is permitted in most sectors but it is barred completely in non bank money lending; pawn broking; retail trade with a capital investment of less than $ 1million. A range of tax incentives including breaks on taxes on corporate profits and dividends, value added tax and import and exercise duties. Except few sectors, automatic approval is given for equity participation up to 100%.
2. Trade Policy Reforms	In the early 1990s, the facility of duty-free import of machinery was introduced for 100% export oriented industries. An incentive to exporters is also provided in terms of duty drawbacks equal to custom duties and VAT paid on imported materials used in the manufacture of exports.	In 1991, the tariff rates were lowered on imports and the maximum tariff rate has set at 50% from 250%. Tax exemption on export earnings and provision of concessional finance for exports and advance license scheme to allow duty-free import of intermediate goods for exports were introduced. The negative list for exports has been significantly pruned.	Significant tariff reforms, such as expanding the import license auction system, increasing the number of items under Open General License system and bonded warehouse facilities for garments exports were introduced. In the mid-1980s, gradual relaxation of quantitative restrictions was observed. In 1989, Govt. introduced a 25% cash subsidy to jute Hessian exporters. In the same year,		In 1977, most of QRs were removed and replaced by import duties and import duties were raised. At the same time, export taxes were increased and export subsidies have reduced largely. In 1993, a reduction on the maximum nominal tariff on imports to 40%, introduction of a four band tariff and the progressive elimination of export duty on traditional exports were observed.

			cash incentives ranging 10% to 35% of the value fob were offered to a range of export items.		
3. Exchange Rate Policy Reforms	On a daily basis the buying and selling rates of the US Dollar on the basis of the Real Effective Exchange Rate were introduced in 1991. Banks are free to determine their own rates of US Dollar and the cross-rates for all other currencies. Capital account is convertible for foreigners as well as expatriate Bangladeshis.	Rupee was made convertible for current account transactions in 1993.	Rupee was experienced a large devaluation in 1985 and 1991 by 14.5% and by 40% respectively. A dual exchange rate system was introduced in 1992 and the DER system was abolished in 1993. In 1993, the govt. announced full convertibility of the Nepalese rupee for all current account transactions at the market determined exchange rates.	The exchange rate changed to 'managed float' against a trade weighted basket of currencies in 1982.	Unification of exchange rate and Relaxation of exchange rate controls were observed in 1977. Large devaluation of the Rupee occurred in 1989. In 1993, Liberalization of exchange controls on the current account of the BoP and abolition of compulsory surrender requirements for exporters were introduced.
4. Fiscal Policy Reforms	Domestic resources mobilization strengthened through improvement in tax policies, better tax collection and introducing of Value Added Tax (VAT) in 1991.	The government reduced the income tax by 40%, abolished the estate duty, raised the wealth tax exemption limit and the effective rates of tax, and lowered taxes on corporation in 1985. Modified Value Added Tax (MODAT) was introduced in 1986.	Measures, such as freezing salary increments, eliminating vacant positions and reducing financial commitments to public enterprises, had undertook to reduce budget deficit during 1985-86. Measures have been taken to increase tax collection such as improved tax administration, broadened the tax base and found alternative sources of revenue in the early 1990s. At the same period, measures, such as controlling salary increments, decreasing transfer payments to public enterprises and reducing subsidies on food and fertilizers, have been taken to control budget deficit and inflation.		Public expenditure was rationalized in 1977. Reform measures have been taken in the tax system, such as lowering income and corporate taxes (by 40% and 35% respectively), abolishing wealth and capital gain taxes with a view to stimulating the capital market, improving tax compliance and increasing administrative efficiency during 1989-93.

5. Industrial Policy Reforms	Export-oriented, private sector-led growth strategy was adopted. No limitation pertaining to equity participation except five reserve sectors. Industries need only to be registered with the Board of Investment (BOI) to obtain institutional facilities. Foreign investors are allowed all the facilities available to domestic investors, and repatriation of profits.	Industrial licensing, permission from the Government of India for new investments and capacity expansions, has been abolished. Monopolies and Restrictive Trade Practices Act have also been eliminated. Majority foreign investment (up to 51%) is freely allowed in most industries.	Liberal Industrial Policy was declared. In 1987, provision of pre-export loans to exporters, provision of duty drawback to export-oriented industries, bonded warehouse facilities to EO industries, establishment of EPZs and industrial village and in 1992, reduction of sales tax and excise duties on locally produced goods were introduced.		
6. Reforms in Public Sector Enterprises and Privatization	No govt. permission is necessary to set up new industries except in a few reserved sectors. Identify and remove legal, policy and regulatory constraints on private investment.	The govt. drastically reduced the significance of the Monopolies and Restrictive Trade Practices Act, by raising the minimum limit of assets of a company to come under the purview of the Act from Rs. 200 million to Rs. 1000 million in 1985.	In 1991, a privatization cell was created and in 1993, two corporations were liquidated and eight enterprises were privatized.	Rationalization of public investment program was initiated.	In 1977, expenditure on social welfare had reduced.
7. Financial and Banking Reforms	The policies of disinvesting a few nationalized banks were adopted and the permission had given for setting up of all kinds of financial institutions in private sector since the early 80s. The commercial banks were allowed to set their own bank rates freely. Reforms measures of NCBs have taken in terms accounting and auditing system and technical improvement of management. In 1990, an act to expedite NCB loan recovery was enacted.		In 1986, Foreign banks were permitted to operate. In the same year, interest rates were partially liberalized for commercial banks. However, in 1989, commercial banks were granted full freedom to set deposit rates. In 1993, a large reduction in the SLR took place with a view to increasing commercial banks liquidity and to enable them to reduce interest rates for lending. Nepal Stock Exchange was created in 1994.		De-control of prices and interest rate was introduced in 1977.

Sources: Shand (1999), Sahoo (2006).

A.3 Changes in Variables

Table A.3.1: Changes in FDI as Percentage of GDP: 1980-2004

Period	Bangladesh	India	Nepal	Pakistan	Sri Lanka
1980-1984	0.022	0.028	0.004	0.228	0.958
1985-1989	0.007	0.058	0.030	0.430	0.546
1990-1994	0.020	0.144	0.000	0.672	1.128
1995-1999	0.238	0.646	0.228	1.103	1.299
2000-2004	0.440	0.708	0.059	0.749	1.150
Percentage change between 1980-84 and 2000-04	1861.74	2403.99	1313.82	228.11	20.08

Source: World Development Indicator (WDI) 2006

Table A.3.2: Changes in GDP Growth Rate: 1980-2004

Period	Bangladesh	India	Nepal	Pakistan	Sri Lanka
1980-1984	3.24	5.58	3.30	7.30	5.12
1985-1989	3.20	6.21	4.85	6.43	3.17
1990-1994	4.60	4.86	5.50	4.54	5.58
1995-1999	5.01	6.53	4.27	3.41	4.94
2000-2004	5.44	5.74	3.52	4.18	3.94
Percentage change between 1980-84 and 2000-04	67.90	2.81	6.74	-42.80	-22.96

Source: World Development Indicator (WDI) 2006

Table A.3.3: Changes in Literacy Rate: 1980-2004

Period	Bangladesh	India	Nepal	Pakistan	Sri Lanka
1980-1984	29.96	42.71	24.12	29.26	86.02
1985-1989	32.60	46.87	28.06	32.98	87.74
1990-1994	35.36	50.90	32.58	36.96	89.31
1995-1999	38.27	54.85	38.27	40.80	90.79
2000-2004	40.87	61.07	44.51	45.52	91.73
Percentage change between 1980-84 and 2000-04	36.41	42.99	84.54	55.58	6.64

Source: World Development Indicator (WDI) 2006

Table A.3.4: Changes in the Index of Openness: 1980-2004

Period	Bangladesh	India	Nepal	Pakistan	Sri Lanka
1980-1984	16.50	30.35	12.09	21.45	10.70
1985-1989	18.00	48.44	11.04	24.88	16.74
1990-1994	18.45	32.81	9.14	24.10	12.20
1995-1999	13.55	21.67	8.35	17.41	6.94
2000-2004	10.84	12.13	9.52	12.42	3.72
Percentage change between 1980-84 and 2000-04	-34.30	-60.02	-21.30	-42.10	-65.25

Source: World Development Indicator (WDI) 2006

Table A.3.5: Changes in Domestic Investment as percentage of GDP: 1980-2004

Period	Bangladesh	India	Nepal	Pakistan	Sri Lanka
1980-1984	16.53	20.78	18.26	18.49	28.44
1985-1989	16.41	23.21	21.53	18.20	22.19
1990-1994	17.50	22.74	20.81	19.04	23.33
1995-1999	20.49	22.54	24.41	16.45	24.06
2000-2004	22.89	22.25	24.85	14.61	22.56
Percentage change between 1980-84 and 2000-04	38.48	7.07	36.06	-20.97	-20.66

Source: World Development Indicator (WDI) 2006

Table A.3.6: Changes in Growth Rate of Labour Force: 1980-2004

Period	Bangladesh	India	Nepal	Pakistan	Sri Lanka
1980-1984	2.54	1.99	1.72	2.73	2.12
1985-1989	2.56	1.85	1.85	2.60	1.94
1990-1994	2.15	2.08	2.07	2.36	1.98
1995-1999	2.21	2.12	2.22	2.78	2.16
2000-2004	2.20	2.07	2.31	2.96	2.01
Percentage change between 1980-84 and 2000-04	-13.51	4.12	34.07	8.52	-5.09

Source: World Development Indicator (WDI) 2006

Table A.3.7: Changes in the Trade-GDP Ratio: 1980-2004

Period	Bangladesh	India	Nepal	Pakistan	Sri Lanka
1980-1984	0.20	0.15	0.31	0.34	0.74
1985-1989	0.18	0.14	0.33	0.35	0.63
1990-1994	0.21	0.18	0.41	0.37	0.72
1995-1999	0.30	0.24	0.58	0.36	0.80
2000-2004	0.35	0.30	0.50	0.38	0.82
Percentage change between 1980-84 and 2000-04	71.60	103.08	60.67	11.33	10.79

Source: World Development Indicator (WDI) 2006

A.4: FDI, Trade Liberalization and Economic Growth: Literature Survey

Authors (year)	Data/coverage	Questions addressed	Estimation techniques	Major findings
Agosin and Mayer (2000)	UNCTAD for 32 developing countries over the period 1970-96.	(4)	Three investment equations (one for each region) on pooled data using seemingly unrelated regressions (SUR)	In Asia, there has been substantial crowding in of investment, while crowding out has been the norm in Latin America. In Africa, FDI has increased overall investment one-to-one. The positive impacts of FDI on domestic investment are not assured.
Agrawal, Pradeep (2000)	For 5 South Asian countries over the period of 1965-1996	(1) and (4)	OLS and fixed effect model	An increase in FDI inflows was associated with a many-fold increase in investment by national investors. The impact of FDI inflow on GDP growth is found to be negative prior to 1980, mildly positive for early eighties and increasingly positive over the eighties and early nineties. FDI inflows contributed more to investment and to GDP growth than an equal amount of foreign borrowing.
Blomstrom, Lipsey and Zejan (1994)	IMF database for 78 developing countries over the period 1960-85.	(2)	Granger causality	FDI Granger-causes economic growth
Borensztein, E; J De Gregorio and J-W. Lee (1998).	OECD data for 69 developing countries for the two periods: 1970-79 and 1980-89.	(1), (2) and (4)	The SUR and the instrumental variable (IV) approach.	FDI has a positive effect on growth. However, causality analysis reveals that fact that the direction of causation actually runs from growth to FDI. In a dynamic manner, FDI affects domestic investment with a negative initial effect and the subsequent positive effects for the panel data as well as for most of the countries individually.
Carkovic and Levine (2001)	WDI and IMF database for the period 1960-95.	(1), (2) and (4)	Dynamic Panel Data Estimator (GMM)	The impact of the exogenous component of FDI on GDP growth is not significantly different from zero, not is FDI strongly linked to productivity (TFP) growth. These results are robust after controlling for the level of human capital and financial development.

Authors (year)	Data/coverage	Questions addressed	Estimation techniques	Major findings
Chowdhury, Abdur and George Mavrotas (2006)	Data from three countries – Chile, Malaysia and Thailand – are used for the period runs from 1969 to 2000 from the *Global Development Finance* and *World Development Indicators*, and *Balance of Payments Yearbook* (IMF).	(2)	The augmented Dickey-Fuller (ADF) test, Toda-Yamamoto test, Bootstrap test.	The empirical findings based on the Toda-Yamamoto causality test suggest that it is GDP that causes FDI in Chile and not vice versa. In the case of both Malaysia and Thailand, there is strong evidence of a bi-directional causality between GDP and FDI.
De Mello (1999)	IMF's *Balance of Payments Statistics*, for 16 OECD and 17 non-OECD countries over the period 1970-90.	(1) and (4)	Stationarity and cointegration analysis plus dynamic panel estimation (fixed effect and mean group estimators)	The FDI-growth nexus is not robust in all countries. Where the positive relationship holds, it depends on country-specific factors. FDI enhances output growth through higher productivity in OECD countries, and through capital accumulation in non-OECD countries. The growth impact of FDI tends to be lower in technological leaders and higher in laggards.
Hansen, Henrik and John Rand (2006)	World Development Indicators (WDI) 2002 and UNCTAD's FDI/TNC database for 31 developing countries for the period of 1970-2000.	(1) and (2)	A mean group estimator, Granger causality, fixed effect model with country-specific time trend.	A strong causal link from FDI to GDP has been found in the long-run. FDI appears to be growth enhancing much in the same way as domestic investment. A higher ratio of FDI in gross capital formation has a positive effects on the level of GDP and hence on growth. The paper finds no systematic differences in the total impact across regions. That is, FDI has a significant long-run impact on GDP irrespectively of the level of development.
Kumar, N. and J.P. Pradhan (2002)	World Development Indicators 2001 (CD-ROM) for 98 developing countries for the period of 1980-99.	(1), (2) and (4)	OLS and fixed effect panel, Granger causality and Arellano-Bond GMM Dynamic Panel	A significant positive effect of FDI on growth in developing countries has been found. The causality tests suggest that the direction of causation between FDI and growth is not pronounced in a majority of cases. However, in a substantial number of cases, growth rate of economy acts as a signaling mechanism for FDI. And finally, FDI appears to crowds-out domestic investment in net terms in majority of countries.

Authors (year)	Data/coverage	Questions addressed	Estimation techniques	Major findings
Nair-Reichert, Usha and Diana Weinhold (2001)	World Bank data for 24 developing countries over the 1971-1995 periods.	(1) and (2)	Non-dynamic fixed-effect panel, first-differenced instrumented panel and mixed (fixed and random) effect model (heterogenous panel).	Standard fixed-effects estimation points to a significant and positive impact of FDI on growth. Results from the dynamic model under the assumption of heterogeneity reinforce this claim and show how the indirect impact of FDI on growth works differently across countries.
Townsend, Isaac (2003)	WDI (2002), OECD's *International Development Statistics,* over the period 1960-1989	(1)	Seemingly Unrelated Regression (SUR) and Generalized Method of Moments (GMM).	FDI does not have an exogenous effect on economic growth in LDCs.

Note: Questions addressed: (1) what is the relationship between FDI, trade liberalization and economic growth in South Asian countries; (2) what is the direction of causes among FDI and growth rate in these economies; (3) what is the direction of causes among trade liberalization and growth; and (4) whether domestic investment and FDI are complements or substitutes in the context of these economies.