



IMF Working Paper

India's Growth Spillovers to South Asia

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Asia and Pacific Department

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Abstract

This study investigates the role of India's economy in explaining the observed growth in South Asia, taking into consideration other sources of growth endogenous to the countries in the region. Since a review of key variables indicates that India's bilateral trade and financial linkages with South Asian countries (SAC) are relatively weak, the paper analyses the spillover effects by focusing on growth more generally with India's growth as an explanatory variable. The results of the panel growth regressions suggest that India's growth has good explanatory power for growth in other SAC after 1995.

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I. INTRODUCTION

Since the mid-1990s, the size of the Indian economy has increased nearly twenty-fold in U.S. dollar terms. Real GDP growth averaged 5 percent annually, poverty reduction has been significant, and living conditions have improved in a variety of dimensions—such as life expectancy, infant mortality and years of schooling. At the same time, India's share in global exports has more than doubled.

In an interdependent world, changes in economic performance in one country could manifest in countries with which it is highly integrated as positive spillovers or adverse exogenous shocks. Various studies have identified trade, financial flows, human capital and terms of trade as key channels through which this takes place. Demand for imports, inputs and final products affect partner countries' supply of exports and real incomes through the trade channel. Increased demand for imports from partner countries impacts positively domestic production, while higher partner countries' exports could worsen current account dynamics, and lower the competitiveness of domestically produced competing goods, which could feedback into investment and consumption decisions. Integrated stock markets and cross border financial services often provide a wider pool for the intermediation of financial resources and greater depth to financial markets, and could also be sources of contagion. Access to education and health services in more developed economies could contribute to human capital development and skills accumulation, which feed into higher growth rates. In addition, growth spillovers and exogenous shocks could be transmitted through changes in factor productivity and business confidence from neighboring countries.

Studies have indicated that when a major economy coexists side by side with smaller countries, spillover effects of the major economy's growth on the smaller economies is often high. Given India's rapid growth and the size of its economy relative to those of its South Asian neighbors, a strong positive spillover effect could manifest in higher growth for countries in the region. India's strong performance as a supply chain for the service sector of advanced economy markets is well researched; but there is little or no research into how India's growth affects the growth of its immediate neighbors. The objective of this paper is to analyze the spillover effects of India's growth to other South Asian countries (SAC)². Panel growth regressions are estimated for SAC with India's growth as an explanatory variable to test the extent to which growth in the region has been associated with developments in India. In addition, trade, a key channel through which spillovers are propagated, and other standard growth model variables are included in the estimation.

The results indicate that overall, India's growth has good explanatory power for growth in SAC after 1995, controlling for other sources of growth endogenous to the countries such as

² Throughout this paper SAC refers to the following South Asian countries: Afghanistan, Bangladesh, Bhutan, Maldives, Nepal, Pakistan, and Sri Lanka.

human capital, the size of the government, inflation, and other trading partners' growth. The growth spillovers from India are likely to be transmitted through a combination of different channels. The rest of the paper is organized as follows: section II discusses trends in India's trade and financial linkages with the rest of the world. India's role in regional economic linkages is discussed in section III, while section IV provides a literature review on India's impact in the region and theoretical issues. An empirical analysis of the spillover effects of India's growth using panel data analysis is undertaken in section V. Section VI concludes the study.

II. INDIA'S GROWTH: STYLIZED FACTS

The Indian economy was until the early 1990s a closed economy with low international trade, high tariff and non tariff barriers, and a tightly controlled capital account. As Kochhar et al (2006) explained, the focus of economic policy was on self sufficiency. Though deregulation began in the 1980s, the stage for India's integration into the world economy was set in 1991 when major reforms were initiated after a severe balance of payments crisis. The reforms included a unified exchange rate system, lowering of tariffs across the board, and substantial reductions in regulation of, and restrictions on, trade. The results of the liberalization were a large increase in exports, imports, and foreign direct investment (FDI), with external debt declining and foreign reserves recording strong improvements.

Table 1. India: Trade Performance 1980 - 2010

	1980-1984	1985-1989	1990-1994	1995-2000	2000-2005	2006	2007	2008	2009	2010
	(Annual percentage change)									
Trade										
Export value	5.4	8.9	9.5	11.4	20.7	25.1	24.4	18.5	-1.1	26.3
Goods	4.9	10.4	9.8	9.5	18.9	21.1	24.3	19.2	0.3	26.9
Services	7.2	4.3	8.4	18.4	25.2	32.8	24.7	17.4	-3.7	25.0
Export volumes	6.8	3.5	8.1	11.1	14.7	13.8	17.1	10.6	0.7	21.7
Goods	8.2	10.4	9.6	9.8	11.6	6.5	14.8	6.5	5.5	19.9
Services	3.5	-0.6	1.5	18.6	24.3	28.0	20.9	17.0	-6.0	24.6
Import value	2.3	9.2	6.9	11.7	20.4	24.6	24.0	23.6	3.7	21.8
Goods	1.2	9.3	6.4	11.0	21.0	23.8	25.2	27.7	2.3	19.3
Services	12.5	9.1	9.9	16.2	18.5	28.6	18.7	4.5	11.8	34.8
Import volumes	5.8	5.3	7.2	9.3	10.3	9.4	16.3	10.8	8.3	16.6
Goods	5.3	5.5	7.6	8.2	8.7	4.9	16.6	14.0	7.6	10.7
Services	11.8	6.8	5.0	20.9	21.6	30.1	15.2	-1.2	11.3	41.2
Memorandum:										
	(in percent of GDP)									
<i>Export of Goods and Services</i>	5.9	5.8	8.5	11.1	14.9	21.3	20.9	22.8	22.3	21.8
<i>Imports of Goods and Services</i>	8.7	8.4	10.1	14.2	17.0	25.0	24.4	27.8	28.5	26.9

Sources: IMF World Economic Outlook.

Exports growth doubled in the first ten years after the reform, from an annual growth of around 11.4 percent average during 1995–2000, to 25 percent by 2006 (Table 1). Services exports, especially software and information technology (IT), also grew rapidly. Exports of goods and services now account for around 22 percent of India's GDP, up from around

8 percent at the eve of the reforms. Imports have also grown remarkably, reflecting India’s growing integration with the global economy.

The destination and source of India’s trade have also become more diverse since the mid 1990s. While in the early part of India’s transformation Europe and other advanced economies accounted for a large share of India’s trade, in the past decade the share of trade with Asia, Africa and the Middle East has grown significantly, surpassing that of the advanced economies (Chart 1). At the beginning of India’s transformation, the key contributors to export growth were food and beverage categories, but twenty years later India’s exports are led by services. India’s exports of IT have grown consistently above the global average since 2000, and the share of services in India’s exports has been much higher than in most comparator countries. Between 1995 and 2010, India’s share of services exports in world trade more than quadrupled, while goods exports only doubled (Anand et al). This contrasts with the rest of Asia where the market share of goods exports is higher than services and market share gains in services are not rising as fast (Chart 2).

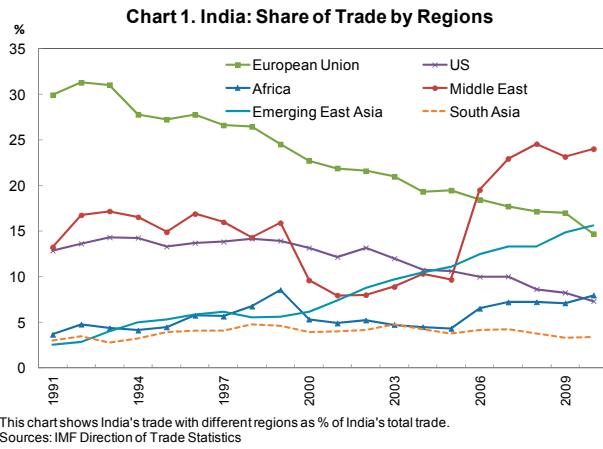
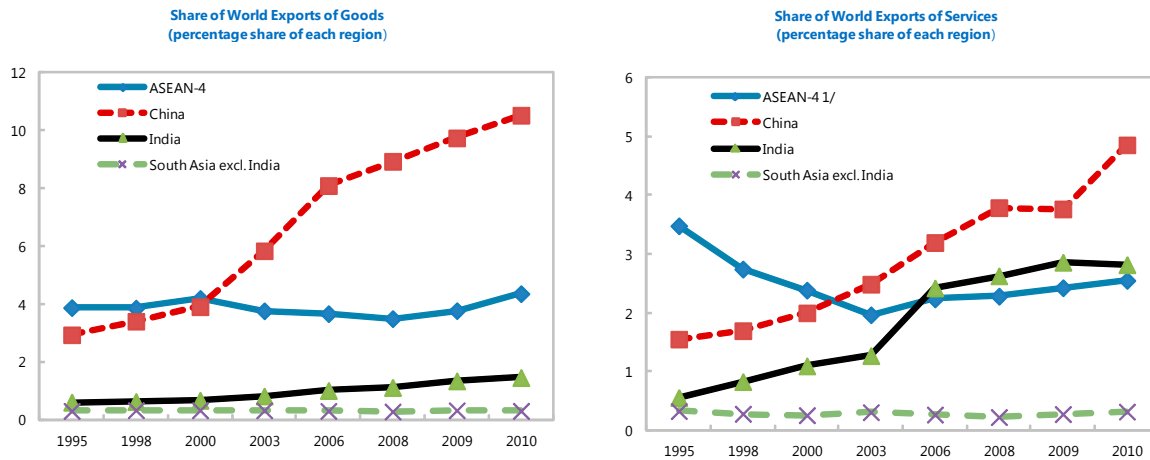


Chart 2. Regions' Share of World Exports of Goods and Services, 1995-2010



Sources: IMF Direction of Trade Statistics; IMF World Economic Outlook; and IMF Staff calculations. ASEAN-4 comprises Indonesia, Malaysia, Phillipines and Thailand.

Nevertheless, while India has made progress also in merchandise exports, it still exports less than other Asian countries like China and ASEAN-4. Though strong growth since 1995 has translated into a doubling of India's exports to developing Asia, its 1.7 percent share is still small compared to China (7.1 percent) and ASEAN-4 (8.7 percent) (Table 2).

One explanation for the small share of India in world and regional trade is that despite the reforms and trade liberalization, the economy is not as open. India has never been as aggressive as East Asian in attracting foreign investors and facilitating their operations through one-stop shops, tax incentives, outright grants, and concierge-level services. In addition, trade restrictiveness is higher when compared to regional partners.

Assuming that high tariff are indicators of restrictiveness, a comparison of import duty (as a share of goods imported) in India, China and other regions confirms that tariff walls are still high in India (Chart 3). Nontariff barriers also appear to be higher in India and SAC compared to other emerging economies in Asia (Panagariya 1999).

The strengthening of India's financial linkages with the external world was also a major focus of the reforms. First, the liberalization of some parts of the capital account – mostly equity flows – encouraged foreign investment and reduced reliance on short-term debt creating flows. Outflows, especially those linked to initial inflows by Non Resident Indians, were liberalized. As a result, FDI and equity portfolio flows increased significantly as a share of GDP between 1995 and 2010 (Table 3).

Table 2. Share of World Exports to Developing Asian Countries

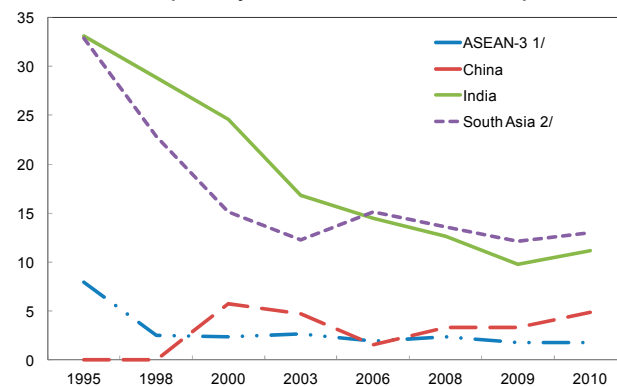
	1995	1998	2000	2003	2006	2008	2009	2010
	(Percentage share)							
ASEAN-4 ^{1/}	6.2	7.3	7.1	7.4	7.4	7.4	7.6	8.7
China	2.3	2.6	3.0	4.0	5.4	6.4	6.9	7.1
India	0.8	0.9	0.8	1.3	1.5	1.4	1.6	1.7
South Asia ^{2/}	0.3	0.4	0.3	0.3	0.4	0.3	0.3	0.3

Sources: IMF, *Direction of Trade Statistics*; and IMF staff calculations.

1/ ASEAN-4 comprises Indonesia, Malaysia, Philippines, Thailand.

2/ Excluding India. Afghanistan and Bhutan not reported.

Chart 3. Import Duty Revenue in Percent of Goods Imported



Sources: IMF sources and staff calculation.

1/ India, Thailand Philippines; 2/ Maldives, Nepal, Pakistan

Table 3. India - Composition of Foreign Assets and Liabilities, 1995-2010

	1995	2000	2003	2006	2008	2009	2010
	(percent of GDP)						
Portfolio Flows	-1.1	0.0	1.2	-0.3	-2.9	1.9	0.6
Foreign Direct Investment	0.6	0.8	0.7	2.2	3.0	2.7	1.6
Private Debt ¹	...	0.0	0.1	0.1	0.1	0.1	0.1
Total External Reserves	6.0	8.4	17.5	19.5	20.5	22.4	18.2
Total External Debt	0.03	0.02	0.02	0.02	0.02	0.02	0.02

Sources: IMF, *World Economic Outlook*; CEID Database; IIP, and IMF staff calculations.

1/ Private debt comprises investments in bonds, notes, and money market instruments by banks and nonbanks as reported in the International Investment Position (IIP) database.

External debt decreased and foreign reserves increased substantially during the period, and the domestic financial system witnessed a strong transformation. Prior to the reforms, most banks were largely state owned with little equity capital. Banks, pension funds, and insurance companies were forced to buy government bonds as their primary investments. With financial sector reforms, barriers to entry were relaxed, and financially repressive policies were gradually eased. The result was increased financial deepening, though the system is still dominated by publicly owned financial institutions.

Given greater openness, stronger growth, and better integration into the world economy, India's growth should start to have significant spillover effects on neighboring countries, which compared to India are relatively small economies. As India's exports and imports expand, and its financial flows become more diversified, both positive and negative economic shocks to the economy should, other things being equal, be readily transmitted to its trading partners, with the speed and magnitude of transmission depending on the strength of the economic linkages. The extent of India's economic linkages to the rest of South Asia is examined in the next section.

III. INDIA'S ECONOMIC LINKAGES TO SOUTH ASIA

Many South Asian countries share a common history and culture, and until 1947 the three largest – India, Pakistan and Bangladesh – had a common market with integrated monetary and communication systems. Though the economies share similar developmental challenges, India's economy is disproportionately larger than its

Table 4. South Asia - Selected Indicators, 2009-2010 average

	Imports from India (Share of total import)	Exports to India (Share of total export)	GDP (US\$ billion)	GDP per capita (US\$)
Afghanistan	5.3	22.4	10.6	517.0
Bangladesh	13.9	2.2	89.4	638.0
Bhutan	41.4	93.5	1.3	1978.0
Maldives	8.9	21.5	2.2	6363.0
Nepal	56.7	56.5	12.5	652.0
Pakistan	5.7	1.3	166.5	1050.0
Sri Lanka	23.6	5.3	42.0	2435.0
<i>Memo</i>	Trade with SAC, percent of total			
	Imports	Exports		
India	0.6	4.7	1310.2	1265.0

Source: IMF Sources

neighbors'. Currently, India accounts for about 80 percent of the region's GDP, Pakistan accounts for about 10 percent, Bangladesh 6 percent, Sri Lanka 2 percent, and the rest less than 2 percent.

Economic growth in the region accelerated since the late 1990s, a period that coincides with the opening up of the Indian economy. On average, the rate of growth of real per capita GDP rose from 3.5 percent in 1990–1995 to 4.5 percent in 2005–2009. This was the case even though Afghanistan, Nepal and Sri Lanka faced considerable political challenges that likely negatively affected macroeconomic performance for part of the period under study. India's granting of duty-free access to goods from five SAARC countries in November 2011 is expected to strengthen intraregional links and there is a framework agreement to reduce custom duties of all traded goods to zero by 2016.³

Unlike some regional powers such as South Africa, India does not operate an economic union with its neighbors⁴. For the smaller economies like Bhutan and Nepal, India is the single-largest trading partner, and a fixed peg with the Indian rupee provides a source of stability and has helped anchor inflation. For Bangladesh, trade with India as a share of total trade remains around 10 percent since mid-1990s (Chart 4); while Sri Lanka's trade with India has picked up following a bilateral trade agreement, with exports to India quadrupling since the full implementation of the agreement in 2000. The recent increase in Maldives's trade with India was boosted by increasing demand for tourism, with India supplying round 3 percent of tourists. While in the past political differences hindered the development of formal economic links between Pakistan and India, it is widely believed that unofficial trade between the two countries is sizeable. Trade between the two largest economies in the region is expected to accelerate going forward, given that Pakistan recently granted most favored nation (MFN) status to India.

India's official financial flows, especially to the smaller economies, are key transmission channels for spillover effects to the region. More than 70 percent of Bhutan's budgetary grants are from the Government of India, and almost all (98 percent)

Table 5. FDI Flows 2005-2010
(\$, millions)

	2005	2006	2007	2008	2009	2010
FDI inflows						
Afghanistan	271	238	243	300	185	76
Bangladesh	845	792	666	1086	700	913
Bhutan	9	6	78	28	15	12
Maldives	53	64	91	135	112	164
Nepal	2	7	6	1	39	39
Pakistan	2201	4273	5590	5438	2338	2016
Sri Lanka	272	480	603	752	404	478
Total	3653	5860	7277	7740	3793	3698
FDI outflows						
India	2985	14285	17234	19397	15929	14626

Source: UNCTAD World Investment Report

³ The South Asian Association for Regional Cooperation (SAARC) was founded in 1985. Its seven founding members are Bangladesh, Bhutan, India, the Maldives, Nepal, Pakistan, and Sri Lanka. Afghanistan joined the organization in 2005. In 2004, SAARC countries reached an agreement to create the South Asian Free Trade Area (SAFTA).

⁴ South Africa, together with Botswana, Lesotho, Namibia and Swaziland belong to the Southern African Customs Union. In addition, all except Botswana also share membership of the Common Monetary Area (CMA).

of Bhutan's external debt is owed to India and serviced automatically from the proceeds of joint venture hydroelectric power receipts. In Maldives, loans from India account for about 20 percent of external debt outstanding, and the State Bank of India is the second largest bank operating in Maldives. In Afghanistan, India recently committed to US\$ 650–750 million (about 4 percent of GDP) in aid through direct and indirect budget support. In 2010, EXIM Bank of India extended a line of credit of \$1 billion to the Government of Bangladesh for financing eligible goods and services, including project exports and consultancy services. While these flows allow these countries to bridge the gap between domestic savings and investment, enabling higher levels of consumption, they could also make the economies susceptible to adverse developments in India.

Although bilateral financial flow data are not available on a systematic basis, private sector financial flows in South Asia seem to be low. Using firm-level data, Kumar (2008) shows that outward foreign direct investment (FDI) from selected Indian enterprises to South Asia averaged about \$20 million a year in 2002–2006, less than 1 percent of the total FDI outflows included in the sample. If this percentage is applied to India's aggregate FDI outflows, India's FDI to SAC would account for less than 4 percent of the total FDI inflows received by SAC (Table 5). However, there are signs that intraregional FDI is now on the increase, as some of India's major corporations are expanding their regional investments, taking advantage of a relatively good business environment in some of the countries of the region. Tata Inc., for example, has, after a failed attempt in 2004, reopened discussions with Bangladesh on investment in the country's telecoms, power and automobile sectors. In Maldives, Indian foreign direct investment is being deployed to the expansion and modernization of the Malé airport.

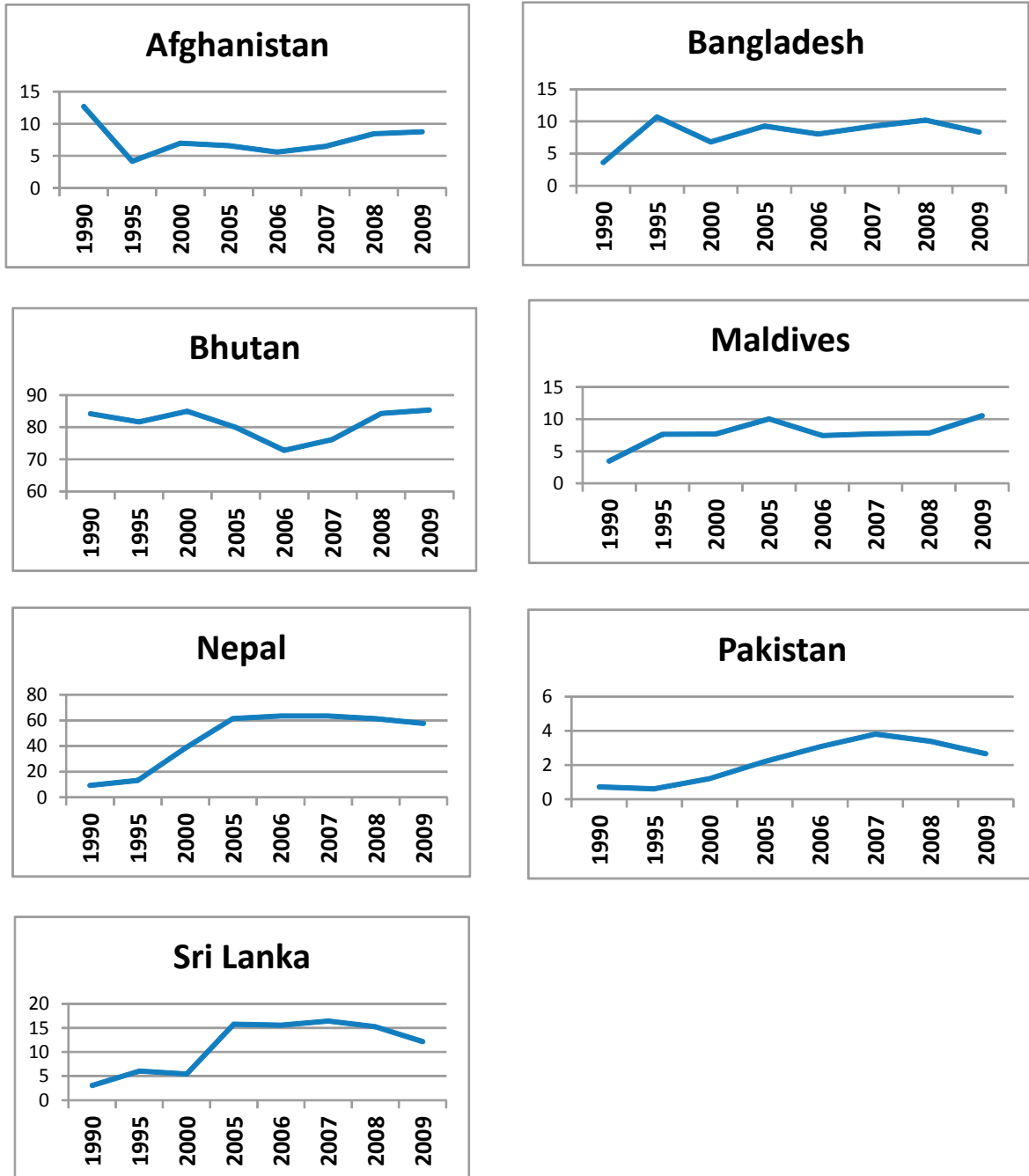
In recent times, the main driver of India's foray to neighboring SAC is its energy requirement. In Bhutan, the key linkage in the real sector comes from hydroelectric power projects, jointly being developed using grants and loans from India. The power projects are providing a surge in export earnings for Bhutan while helping supply critical power to India, and over the years should bring strong growth dividends to both countries. In Bangladesh, India is jointly developing thermal power generation facilities, and an electricity transmission interconnection project is planned to link the electricity grids of the two countries, with India expected to supply at least 250 MW of power to Bangladesh. To facilitate trade, Bangladesh would allow the use of its sea ports for the movement of goods to and from India by road and rail. In Afghanistan, India is constructing a major road in a remote area, and further development and cooperation are being channeled through rebuilding of air links and power plants.

Remittances provide another channel through which India's growth may affect growth in SAC. Although not recorded by official data, it is believed both Nepal and Bangladesh have a sizable number of emigrants in India. Their remittances are important in financing domestic consumption and moderating the impact of exogenous shocks. On the other hand, Indian

migrant workers constitute a large proportion of the expatriate labor force in Bhutan and Maldives, especially in the construction sector.

India's contribution to human capital development in South Asia is mainly through education and health. It has long been a destination for higher education in the region. From 1992 to 2007, the number of SAC students studying in India's universities has more than doubled to almost 5000 (Dongaonkar and Negi 2009). Both officially and through private sector driven initiatives, India is investing in health and education sectors in other countries. India is also assisting to train Afghan civil servants, diplomats and police, while in Bangladesh and Bhutan it is providing technical assistance for the implementation of power projects.

Chart 4. SAC: Trade with India in Total Trade (%)

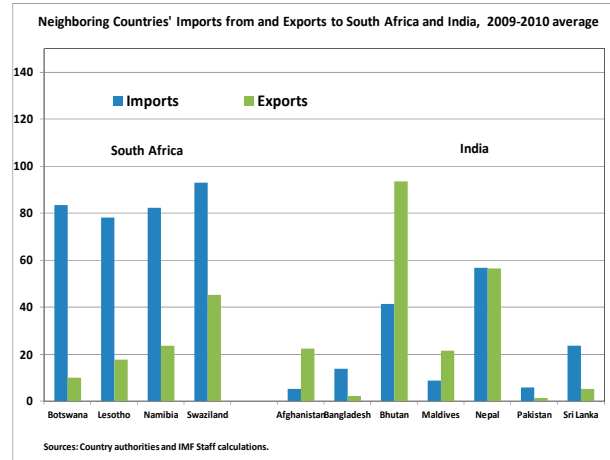


These charts show the trade with India as % of total trade for each individual SAC.
Source: IMF Direction of Trade data and staff estimates.

Box 1. South Asia, Southern Africa and East Asia: A Comparison

Growth and integration patterns between South Africa and the Southern Africa region (SAR) and between China and East Asia produced similar outcomes to those of India in South Asia, though the magnitude of the impact differs.

Economic growth in the Southern African region has, as a whole, accelerated since the mid 1990s, coinciding with the post-apartheid opening up of the South African economy. The average GDP growth rate of the region rose from 2.7 percent in 1990-1994 to 3.4 percent in 2006-2010, with most of the acceleration accounted for by the post-apartheid growth spurt in South Africa. The smaller countries have benefited from South Africa's strong growth, and real GDP per capita relative to South Africa was higher in 2005-08 than in the previous periods. The Southern Africa Customs Union (SACU), to which all the countries belong, aided integration and South Africa accounts for more than 80 percent of SAR imports. Trade within SAR is free from tariffs and virtually all other trade barriers. Though most of the smaller countries' imports, especially of intermediate goods, are from South Africa, they have been able to build solid export markets. The bulk of Lesotho and Namibia's exports, for example, are destined for markets outside the region.

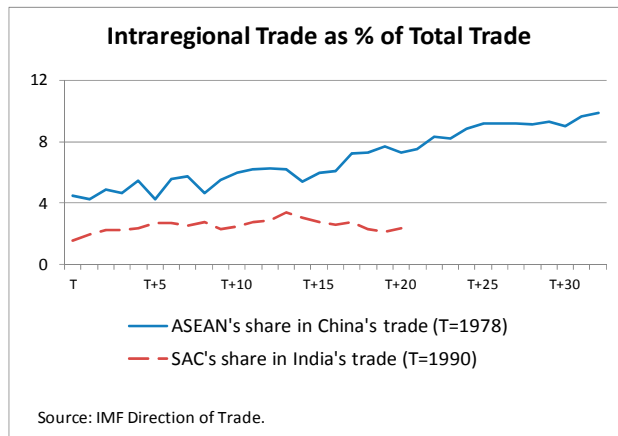


China, an emerging economic giant in Asia, has developed close trade linkages with the ASEAN region, with the share of ASEAN trade in China's total trade doubling to nearly 10 percent from the early 1990s to 2010. At the same time, China's share in ASEAN's exports has nearly tripled, and its share in imports more than quadrupled from 1993 to 2008. Though the ASEAN-China Free Trade Area came into effect on January 1, 2010, strong trade linkages preceded its establishment, in part because countries pursued an export-oriented growth strategy, and, over time, were able to shift production to exploit changing trade complementarities with China. For example, while the more developed ASEAN countries had exported mainly primary goods and natural resource commodities to China until the early 1990s, information and communication technology goods and intermediate capital goods comprise the majority of their exports to China now, reflecting China's growing demand for high-tech products. For the poorer ASEAN countries (Cambodia, Vietnam, Laos and Myanmar), comparative advantage lies in low labor costs, especially as relative incomes rise in China.

Non trade factors have also contributed significantly to regional integration and strong spillover effects in SAR and East Asia. In SAR, financial integration is enhanced by membership in the Common Monetary Arrangement (CMA, a quasi currency board) and South African banks intermediate most cross border financial flows. Membership in the CMA facilitates cross-border trade and financial flows, provides a framework for monetary policy, and helps maintain price stability. The policy credibility of the South African Reserve Bank has a positive spillover effect, lowering inflation expectations in the smaller countries, with the peg of the smaller countries' currencies to the South African rand reducing transaction costs for cross border flows. In addition, SAR labor markets are fairly well integrated, and remittance flows from nationals resident in South Africa represent a key source of income and balance of payments flows for the smaller countries, especially Lesotho and

Swaziland. In East Asia, the FDI channel has been a major source of integration. Although Chinese firms are not significant investors in ASEAN countries, there are considerable FDI flows from ASEAN to China, mainly involving intra-firm trade and cross-border production sharing. ASEAN's FDI to China accounted for about 6 percent of total FDI received by China in 2008. As trade flows between China and ASEAN continue to grow on account of the tariff reductions from the free trade agreement, this is expected to bring more associated FDI.

Several factors account for the stronger trade linkages in Southern Africa and East Asia when compared to South Asia. The Southern African region comprises relatively more homogenous countries and the size of South Africa's economy, relative to the rest of Southern Africa economies, is much larger than India's in South Asia. In East Asia some of the ASEAN economies had attained relatively high levels of development before the opening up of China, as a result of which they were in a better position to exploit trade complementarity with China than were poor South Asian countries with India. In merchandise trade, China and ASEAN economies are largely complementary, underlined by the intensification of cross-border production networks in the region. Intra-industry trade now accounts for a large share of China-ASEAN trade, reflected by the dominance of trade in materials, parts and components. On the other hand, India's exports have been driven by service exports, with limited scope for integrating its South Asian neighbors into the value chain.



The potential for increased integration and stronger spillover effects from India to the rest of South Asia is strong. Trade between China-ASEAN began to grow steadily in the early 1990s, nearly a decade after China began its reform and opening policies. As India's economic reforms started about 10 years later than China's, one can argue that India is still in the relatively early stage of integrating itself with the intraregional trading system. Indeed, India's trade with the rest of the world on average grew twice as fast in the last ten years as in 1991-2000.

This pattern may soon extend to South Asia.

A supportive policy framework to facilitate intraregional trade in South Asia would help. Trade within Southern Africa is virtually free of any restrictions and the recently launched ASEAN-China Free Trade Area reduces tariffs on almost 90 percent of imported goods to zero. Trade restrictiveness in South Asia, however, has remained high, as indicated by the World Bank's Overall Trade Restrictiveness Index. In India's case, tariffs for agricultural goods and processed goods are higher than for semi-manufactures, consistent with its strategy of protecting agriculture and promoting the development of manufacturing activities that require imports of intermediate goods. As trade between India and Sri Lanka saw a substantial increase following the bilateral trade agreement, there is reason to believe the South Asian Free Trade Area (SAFTA), once fully implemented, can have a significant positive impact on intra-South Asia trade linkages.

IV. LITERATURE REVIEW

Various studies have attempted to explain the relatively modest level of trade and regional integration in South Asia. One reason often adduced is that the countries share some basic similarities—low income, relatively abundant labor, and comparative advantage in similar commodities, thus reducing the potential for comparative advantage driven trade. However, this alone does not explain why the smaller countries have not been transformed into an Indian supply chain by creating “niche” sectors to take advantage of India’s growth. Some other findings include:

- **Infrastructural constraints and institutional restrictions.** Wilson and Ostuki (2005) find that delays in transit due to road or port congestion, and customs procedures (non-tariff barriers) raise the costs for exporters. Their study indicates that an improvement in South Asia’s infrastructure to around 50 percent of East Asia’s could improve intra-regional trade by about 60 percent.
- **High levels of overall protection.** The average weighted tariff is relatively high, relative to the world average. India is less open in terms of weighted average applied tariff rate than Sri Lanka, Pakistan or Nepal, implying that the protection imposed by the largest economy could have reduced the region’s trade.
- **Challenging business environment.** South Asia ranks second last among regions across the world in terms of ease of trading across borders due mainly to procedural delays stemming from institutional requirements. In 2011, India is ranked 100th in “Ease of trading across borders” compared to China’s rank of 50th in the world.⁵ India’s poor rank relative to other emerging countries reflects the large number of documents required by exporters and importers, the time delays in exports and imports, and the high costs per container.
- **Restrictive rules of origin and destination.** Countries often specify restrictive rules of origin, which raise the transactions costs of trading across borders. Due to inadequate administrative capacity to curb illegal flows, SAARC members specify the port of entry for certain products, which may have curbed trade.
- **Limited revealed comparative advantage.** South Asian economies have similar patterns of revealed comparative advantage in a relatively low range of products, and bilateral trade structures exhibit low trade complementarities. Kemal (2005) finds that low trade complementarities “reflect in part the barriers that countries have imposed on their trade, which were intended to change the trade pattern away from what would emerge were they to allow their true comparative advantage to emerge”. In

⁵ *Ease of Doing Business 2011*, World Bank, <http://www.doingbusiness.org>.

contrast, China and ASEAN economies are largely complementary in merchandise trade. As cross-border production networks grow in the China-ASEAN region, intra-industry trade has come to account for a large share of intraregional trade, reflected by the dominance of trade in materials, parts and components.

- **Substantial informal or illegal trade.** Bilateral unofficial trade of India with Bhutan, Nepal, Pakistan, and Sri Lanka was estimated to be more than their respective official trade in the 1990s (Sawhney and Kumar, 2008). Taking into account the informal trade of the region together with the reported formal trade, the total intra-regional trade was found to be higher by 5 percent. Taneja (2004) estimates that the magnitudes of legal and extra-legal trade between Bangladesh and India are roughly the same; that extra-legal trade is estimated to be nearly one third of the value of legal trade between India and Sri Lanka, and that India's formal trade with Pakistan is less than 10 per cent of their estimated informal trade of USD 2 billion.

Though conventional transmission channels for growth spillovers may indicate low integration between India and SAC, it is still possible that India's growth is a source of growth in neighboring countries through indirect channels that affect human capital, factor productivity and overall business confidence. Therefore, an analysis that isolates the direct channels of spillover effects may only present a partial picture, while a growth model that explains SAC growth, augmented with an Indian effect, may offer a more robust explanatory tool for assessing the impact of India's growth on its neighbors.

A considerable body of work has examined the spillover effects of economic growth of a wide range of countries to the rest of the world or to specific regions, with most of them focusing on the contribution of common factors to national business cycle fluctuations. Most of these studies identify direct channels of transmission of spillover effects, such as trade, financial flows and changes in the terms of trade, especially through the exchange rate channel. While earlier studies were mostly undertaken in a static VAR model of real GDP growth, some more recent studies, for example Stock and Watson (2005), have introduced dynamic factor models which reduce common variations across individual countries to a small number of significant but unrelated factors. Their study finds that activity in industrial countries has become more synchronized and driven by common international factors.

Nevertheless, even these newer models suffer from identification problems, which were addressed in Bayoumi and Swinston (2007). The study uses a baseline SVAR to gauge the contribution of different factors, such as trade and terms of trade, to the spillover effect. It has the added advantage that it captures dynamic patterns in the data and, unlike the earlier theoretical models, it allows for a structural interpretation of dynamic responses. The study finds that output in Europe responds positively to impulses from the US, while impulses originating in Europe have only small effects on other areas or countries. Many of the models using similar methodologies have proved useful in capturing the impact on growth from specific channels, including remittances.

A relatively new body of work has focused on spillovers from large regional economies to their smaller neighbors. Obiora (2009) finds that there are significant spillover effects from the EU countries and Russia to the Baltic countries, with shocks from trading partners, financial conditions and trade linkages explaining a significant share of the variation in GDP growth. Ilahi and Shendy (2008) find that real GDP growth, private consumption and private investment in the Middle East and North African countries (including Pakistan) are strongly associated with remittances from and the accumulation of financial surpluses in the oil-driven Gulf Cooperation Council (GCC) countries.

A concern with these models is that they do not capture well the spillover effects from intangibles such as business sentiments and human capital related linkages, and this is more likely to be an issue where large regional economies coexist with smaller neighbors. For example, Indian education and health services are in demand by other South Asian countries. The impact of this on total factor productivity, which then feeds into overall growth, may be blurred in an analysis that focuses only on trade and investment or other channels of transmission of spillover effects that are currently dominant in the literature. Similarly, positive business confidence, for example, about developments in India, could spur increased performance in neighboring countries, providing an additional fillip for growth. Arora and Vamvakidis (2005) address some of these shortcomings by analyzing growth in the aggregate. They find that South Africa is an engine of growth for the rest of Africa, but that the strong growth correlation cannot be explained through an explicit trade channel alone. An empirical model that embeds the spillover impact of India on SAC in a complete growth model is presented in the next section.

V. EMPIRICAL MODEL AND ESTIMATION RESULTS

The Model

We use a panel regression to estimate the impact of India's growth on the growth in SAC, following the specification in Arora and Vamvakidis (2004, 2005 and 2010). Aggregate growth linkages could provide more robust results about the direction of the impact of India's growth on the region.

The model is specified as:

$$(\text{Growth of real GDP per capita})_i = c_i + \beta X_i + u \quad \text{for country } i = 1, \dots, n$$

where the independent variables X_i include the standard variables in growth regressions::

- Convergence (the logarithm of real GDP per capita in the initial year of the period);
- Demographics (age dependence ratio);
- Physical capital (gross domestic investment as a percent of GDP);
- Human capital (secondary school enrollment ratio);
- Trade openness (trade as a percent of GDP);

- Size of government (government expenditure as a percent of GDP); and
- Macroeconomic stability (inflation).

In addition, we include real GDP per capita growth in India, as well as the growth in other trading partners for all SAC to estimate their impact:

- Growth of real GDP per capita in India;
- Growth of real GDP per capita in other trading partners (weighed by share of trade).

All data are from the World Development Indicators, IMF's Direction of Trade data and staff estimates. The regression is estimated using 3-year averages for the time period 1961–2009, except for the initial GDP per capita, which takes the value of GDP in the first year of each three-year period.

Estimations

The panel regression with fixed country effects⁶ for the whole sample period (1961–2009) suggests that India's growth impact is not statistically significant and hence does not help explain growth in SAC (Table 5, column 1). The estimates of other independent variables are largely consistent with the standard growth literature: growth is negatively correlated with convergence, the age dependence ratio, government consumption and inflation, and positively correlated with investment, trade openness and growth in other parts of the world. The estimate on secondary school enrollment has a sign opposite of what one would expect, but it is close to zero and statistically insignificant.

In the second model specification, only the post-reform period data are considered. This set of results show that India's growth is a statistically significant determinant of growth in the rest of South Asia, after controlling for other growth determinants (Table 6, column 2). This is consistent with India's own growth path – its economy became more integrated with the rest of the world after the reforms. The estimation suggests that an increase in growth in India by 1 percentage point is correlated with a rise in growth in SAC economies by 0.37 percentage points. The estimates and levels of significance of the other independent variables are also largely consistent with the literature. Notably, the estimate on the average growth (weighted by share of trade) in other trading partners is close to zero. This does not necessarily mean the growth in SAC is uncorrelated with the growth in the rest of the world.

⁶ A Hausman test strongly rejects the random effect assumption in favor of the fixed effect specification we present here.

It is possible that, for certain periods, SAC growth was positively correlated with the growth in its major trading partners but negatively correlated with that of other regions.⁷

To test whether the conventional trade channel explains India's spillover impact, the third specification in Table 6 includes an interaction term of growth in India with India's share of trade in each SAC's total trade. The interaction term is negative and statistically insignificant, suggesting that India's growth spillovers do not depend on the trade channel. Excluding countries with weaker trade linkages with India, such as Afghanistan and Pakistan, in the regression does not change these results. However, it is also possible that the official data under-report the actual trade flows, and do not capture the full impact of the trade channel in the region. The scarcity of data on bilateral financial linkages and remittances precludes us from estimating the importance of these channels.

Table 6. Growth in India and in Other South Asia Economies: Results of Panel Regression with Fixed Country Effects

	(1)	(2)	(3)
	1963-2007	1995-2007	1995-2007
Independent Variables			
Per capita real GDP growth in India	-0.02 (-0.12)	0.37 (2.44)	0.77 (2.73)
(Per capita real GDP growth in India) x (Share of trade with India in total trade)			-0.49 (-1.33)
Convergence	-3.21 (-2.27)	-5.42 (-1.57)	-4.01 (-1.08)
Age dependence ratio	-0.09 (-2.52)	-0.01 (-0.14)	0.05 (0.56)
Secondary school enrollment	-0.05 (-1.46)	0.08 (1.72)	0.10 (2.17)
Investment/GDP	0.04 (0.82)	0.09 (1.73)	0.08 (1.54)
Trade/GDP	0.11 (5.49)	0.18 (7.51)	0.18 (6.98)
Government consumption/GDP	-0.15 (-2.65)	-0.25 (-3.88)	-0.25 (-3.76)
Inflation rate	-0.03 (-0.50)	-0.17 (-1.73)	-0.22 (-2.10)
Per capita real GDP growth in other trading partners	0.56 (1.69)	-0.01 (-0.02)	-0.53 (-1.01)
Adjusted R-squared	0.57	0.77	0.77

Note: Dependent variable: real GDP per capita growth. T-statistics in parentheses.

⁷ For example, South Asian economies often face competition from East Asia in third markets in terms of consumer goods exports, which constitute a large share of South Asia's total exports, and may feel negative effects from East Asia's rapid growth (Eichengreen and Tong 2006).

Although India's growth has good explanatory power for growth in its South Asia neighbors after 1995, the level of the spillover impact is less than those found in other large economies. While a 1 percentage point increase in India's growth translates into 0.37 percentage point increase for SAC, Arora and Vamvakidis (2005) show that a 1 percentage point increase in GDP per capita growth in South Africa is correlated with a 0.5–0.7 percentage point rise in growth in the rest of Africa for the period 1980–99. They also find a 1 percentage point increase in China's growth is correlated with an average of 0.5 percentage point increase in the growth of the rest of the world for the last two decades, with potentially larger effects for Asian countries (Arora and Vamvakidis 2010).

VI. CONCLUSION

More than twenty years after embarking on a process of economic transformation, India's economy has grown around twenty fold and has become more integrated into the world economy through trade and financial flows. Over those years, India's share of world exports of goods and services has more than doubled, and the destination and source of trade have become more diverse. At the same time, FDI and equity portfolio flows increased 30 fold as a share of GDP. Trade and financial flows from India to neighboring SAC have also increased since the mid 1990s, but are relatively low in absolute terms and when compared to developments in other regions.

Our empirical analysis suggests that India's growth is useful in explaining the overall growth in South Asia, but only after 1995. This growth spillover though does not seem to depend on the traditional trade channel, consistent with the stylized facts on the key trade indicators. Nevertheless, the modest impact in the post reform era indicates that India is able to influence growth in the region. It is likely that India's growth spillovers are transmitted through a combination of direct and indirect channels in different countries, in which case the panel analysis may not be able to pinpoint a particular channel as being the most important. It is possible that the productivity and efficiency of SAC have been enhanced by increased availability of technical knowhow from India and increases in human capital development. The achievements of India in the post-reform era may also have increased business confidence across the region, and contributed to the implementation of policies that eventually affected SAC's growth positively.

The low level of India's growth spillover compared to other regional economic powerhouses raises the question of how best SAC can better take advantage of the fast growth in India as a means of accelerating their own growth. Evidence from the Southern African region suggests that enhanced real and financial flows could provide a stronger basis for integration, improving the benefit of growth through the trade and financial channels. Addressing the challenges in infrastructure, business environment and trade restrictions could make a difference. Considering that even with low trade and financial linkages India's growth spillovers in the region are positive, there is reason to believe that increased intra-South Asia

trade and financial linkages could provide stronger outcomes, consistent with what has been obtained in other regions.

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