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Abstract

The formation of the South Asian Association of Regional Cooperation (SAARC) in the mid-1980s was aimed at achieving regional integration and economic growth. Hence, examining output interrelationships among South Asian economies becomes imperative, but work on this aspect has remained conspicuously absent. This study finds a long-run equilibrium relationship over the 1973–2010 period among five major South Asian nations: Bangladesh, India, Nepal, Pakistan and Sri Lanka. Bangladesh and India registered faster growth than other nations in South Asia since the liberalization in the early 1990s. Not only do these two countries appear to have achieved higher output cointegration than any of the other subgroups, but they also exert maximum influence on their neighbours. Liberalization and output cointegration along with high growth appear to be positively associated in South Asian nations. These findings have policy implications for other developing countries that aspire to grow fast, but lack adequate measures on regional integration.

JEL: C22, C32, F15, O53, O57

Keywords

Output relationships, South Asia, regional integration, impulse responses, variance decompositions

Introduction

The main objective of any regional group is to achieve favourable effects on output through economic integration and cooperation. The formation of the South Asian Association of Regional Cooperation (SAARC) in the mid-1980s was not

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an exception to this end. After three decades of the SAARC, nonetheless, the question of how far this objective has been achieved has remained unclear. This scenario has raised a number of questions such as the following: (a) Has the output interaction between countries in South Asia been positive? (b) How do the output interrelationships among South Asian nations work? (c) Are some countries in the region more integrated and more influential than others? Despite numerous studies on South Asia, most of these questions have remained unanswered. This study attempts to fill this gap by addressing these questions.

Although there is no official boundary of South Asia, the countries that formed the SAARC are branded together as 'South Asia'. These countries are Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka. Out of them, the five major economies that represent more than 99 per cent of South Asian output are India, Pakistan, Bangladesh, Sri Lanka and Nepal (WDR, 2011). India, the largest economy of the region occupying 82 per cent of South Asian output, is also assumed to have played the leading role in influencing other economies in South Asia. The economies Bhutan and Maldives that represent less than 1 per cent of South Asian output are excluded from most empirical studies on South Asia due to unavailability of data. For the same reason, I exclude them too.

I collect the output volume indices with the base year of 2005 for the five nations from the International Financial Statistics (IFS) of the International Monetary Fund (IMF, 2011). Although we can have different measures of output, such as GDP, GNP or GDP at purchasing power, GDP volume indices are now widely used in various studies particularly for cross-country comparisons. The studies of Chauvet and Popli (2003), Dos Santos et al. (2003), Telatar and Cavusoglu (2005), Kehoe and Prescott (2007) and Blecker (2009) are a few examples among many others to name in this regard. The main reason for using the volume index by these studies is that it reflects the output performance of a country along with a base year that makes both intra-country and inter-country comparisons easier. The output index for Bangladesh begins in 1973. Hence, the whole sample including other countries begins in 1973 and ends in 2010, making 38 yearly observations available for each country. These series, expressed in logarithms, are presented in Panel A of Figure 1. Liberalization in most South Asian nations started in earnest in the early 1990s. To see the comparative output performances of the five major South Asian economies, I make them begin with an index value of 100 in 1990, as shown in Panel B of the same figure. On the terminal scale of 2010, the output performance of India becomes outstandingly higher than that of its neighbours. Bangladesh and Sri Lanka occupy the middle position, while Nepal and Pakistan are placed at the bottom. India and Bangladesh are the two countries that have achieved the highest progress in output compared to their neighbours since liberalization had begun in the region.

Significant output interactions between countries in a regional group are important indicators of economic interdependence and the level of integration between nations in the region. Research on this aspect of South Asia is conspicuously absent. Most studies on the region focus on the concepts of export-led

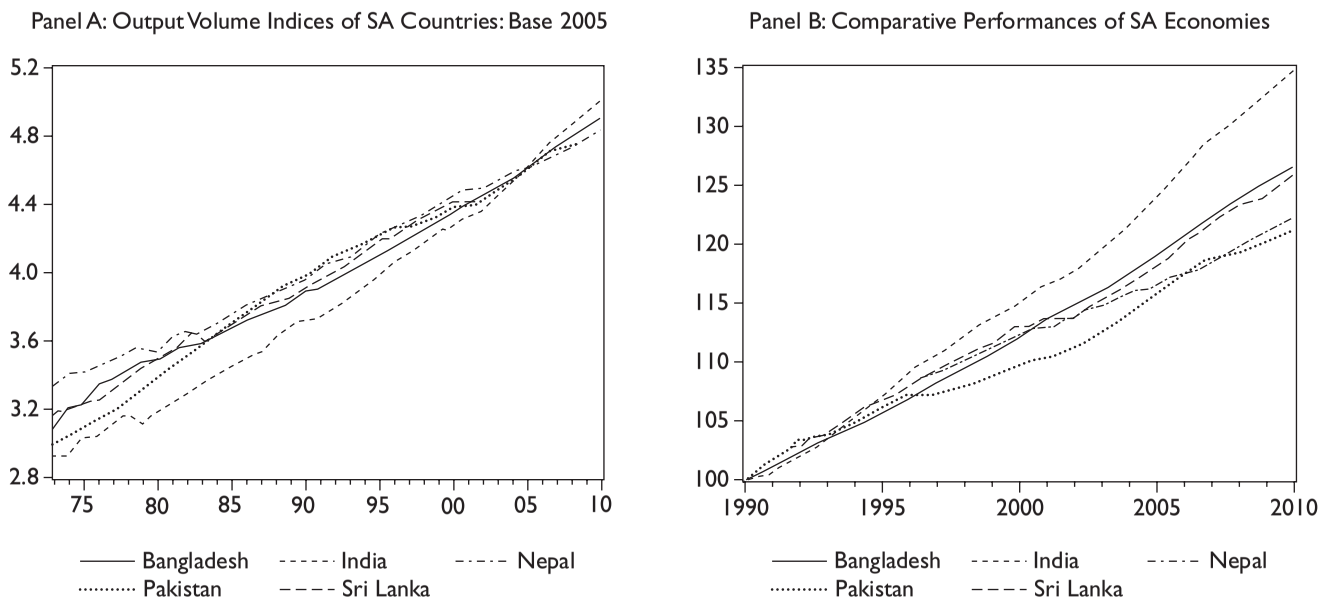


Figure 1. Output Indices and Comparative Performances of South Asian (SA) Economies

Source: International Financial Statistics (IMF 2011).

growth, cross-country trade, savings and investments, poverty, inequality and growth, convergence of inflation and growth, and economic integration. The studies that find evidence on export-led growth for South Asian countries include Dash and Kumar (2007), Din (2004), Love and Chandra (2005) and Parida and Sahoo (2007). Papers that discuss saving–investment behaviours in South Asian nations include Agrawal et al. (2009), Ahmed (2008), Bhandari et al. (2007) and Wahid et al. (2010). Numerous papers have focused on convergence topics. While K. Chowdhury (2005) finds non-convergence of per capita GDP, Esguerra et al. (2009) find convergence of inflation among South Asian countries. Inequality, poverty and growth occupy a considerable area of research for the region. Ghosal (2009) finds a slightly declining tendency in the cross-country inequalities of per capita income in South Asia. Sen and Hazra (2010) show that, even after globalization and realization of high growth, the poorest people in South Asian countries are still facing high risks on various financial and economic fronts.

While there are other studies on the topics like currency union, productivity and even tourism, I find many of them irrelevant to my present work. Hence, I want to finally touch on some papers that worked on the level of integration in the region, although none of them estimated output interrelationships in South Asia. M. Chowdhury (2005) asserts that as globalization and regionalism gained momentum from the beginning of the 1980s, the South Asian countries tried to catch up with the stream under the banner of the SAARC. Das (2008) finds South Asia's shallow integration with the rest of Asia. Jayasuriya and Maskay (2010) argue that the SAARC goal of an economic union remains distant as political tensions between India and Pakistan have hindered any real progress on a regional scale. Weerakoon (2010) believes that the regional trade integration process in South Asia to date has generated only limited enthusiasm. Khan and Latif (2009) conclude that trade between South Asian nations has not been increased to the level of expectations.

Ray et al. (2009) find a faint indication of gradual domestic integration of the financial system in South Asia. They, however, do not estimate regional integration in financial activities. Weerakoon (2009) argues that the integration process in South Asia is unlikely to be an inclusive South Asian regional grouping. As Raghuramapatruni (2011) claims, the performance of the SAARC in the most crucial area of economic cooperation has been far from encouraging. As we noticed, the missing part of most studies that assess the level of integration in South Asia is the estimation on output interaction in the region. Hence, this work, which examines both the long-run and short-run interrelationships of output between South Asian nations, becomes imperative.

To briefly preview the results, this study uses the Johansen cointegration technique and finds a long-run equilibrium relationship among five major South Asian nations. While India, Pakistan and Sri Lanka remain weakly exogenous in the model, Bangladesh and Nepal participate in the error correction mechanism to restore the long-run equilibrium if the system is ever shocked. Impulse responses and variance decompositions are engaged to examine the short-run dynamics of

output interactions between countries in the region. Output interactions between countries, however, are not uniform. Not only do Bangladesh and India appear to have achieved higher output cointegration than any of the other subgroups, but they also exert maximum influence on their neighbours. Thus, India and Bangladesh become two front liners in integration and interaction with neighbouring nations. The output performances of these two nations are more mutually beneficial than the case between any of the other subgroups in the region.

The underlying channels of these mechanisms, though interesting, go beyond the scope of this article and thus are left for future research. This study, however, points out to trade, geography and policy synchronization as the plausible channels of Bangladesh's high integration with India. The amount of bilateral trade between Bangladesh and India, which is the highest in comparison to that between any other subgroups, can be interpreted as an effective channel for Bangladesh's high response to Indian output. Geopolitical reasons can also be congenial in this regard. The striking similarity of policy regimes between India and Bangladesh has arguably contributed to Bangladesh's high integration with India's output performances as well. Liberalization and output cointegration along with high growth appear to be positively associated based on the South Asian experiences. These findings have policy implications for other developing countries that aspire to grow fast, but lack adequate measures on regional integration.

The remainder of this study comprises four sections. The following section outlines methodology used in this article. The third section presents estimations and analyses. The fourth section presents the rationale behind Bangladesh's high integration with Indian output. The fifth section concludes.

Methodology

Five output series, as we see in Panel A of Figure 1, are most likely to have unit roots and thereby are non-stationary. Nelson and Plosser (1982) find that most macroeconomic variables are characterized by unit root processes. The variables must be integrated of order one, that is, I (1), before they can be tested for cointegration. Hence, checking unit roots for all three variables is required. The augmented Dickey–Fuller (ADF) test is widely used in this regard (Dickey & Fuller, 1979, 1981).

Phillips and Perron (1988) proposed a modification of the Dickey–Fuller (DF) test and have developed a comprehensive theory of unit roots. The Phillips–Perron (PP) test has introduced a *t*-statistic on the unit root coefficient in a DF regression, corrected for autocorrelation and heteroscedasticity. Monte Carlo simulations show that the power of the various DF tests can be very low (Enders, 2010, p. 234). Maddala and Kim (1998, p. 107) comment that the DF test does not have serious size distortions, but it is less powerful than the PP test. Choi and Chung (1995) assert that for low frequency data, like mine, the PP test appears to be more

powerful than the ADF test. Accordingly, I adopt the PP methodology to test unit roots in the variables.

If the variables are found to be I (1), testing them for cointegration will be followed as per the Johansen approach, due to Johansen (1988) and Johansen and Juselius (1990). There are five options for making an assumption before carrying out the Johansen test. Option 1 assumes no deterministic trend in data, and no intercept or trend in the cointegrating equation or the test vector autoregression (VAR). Option 2 is the same as Option 1 except it has an intercept in the cointegrating equation. Options 3 and 4 allow for linear deterministic trend in data, and assume intercepts in both the cointegrating equation and the test VAR. Option 4 just adds trend in the cointegrating equation. Option 5, being implausible in the present case for allowing quadratic deterministic trend in data, is not considered.

On the basis of the data, as shown in Panel A of Figure 1, either Option 3 or Option 4 will be appropriate in this study. In this five-variable case, the number of the cointegrating relations must be less than five if the series are really cointegrated. If both the trace and maximum eigenvalue tests recommend the presence of at least one cointegrating relationship, the long-term relationship exists in the system. Then estimating them in a vector error correction (VEC) model will be necessary. The results of the VEC estimation are sensitive to the lag length. For determining the lag length, the most common procedure is to estimate an unrestricted VAR with the variables, and to use the Akaike Information Criterion (AIC) or Schwartz Bayesian Criterion (SBC) to decide on the lag length (Enders, 2010, p. 402). Given my sample size, I decide to use the SBC to determine the lag length of the VAR, because the SBC chooses the most parsimonious model (Enders, 2010, p. 120). In a simulation study, Lutkepohl (1985) finds that for low order VAR processes, the SBC does quite well in terms of choosing the correct VAR order and providing good forecasting models.

After checking the long-run coefficients and short-run adjustment process in the VEC model, innovation accounting that comprises impulse responses and variance decomposition analysis will be presented. The impulse response analysis shows the reaction path of a variable due to one standard deviation (SD) shock in the innovation of another variable. The variance decomposition analysis shows the level of variability in one element that can be explained by the innovations from the other element in the VAR system. Lutkepohl and Reimers (1992) show that innovation accounting can be used to obtain information concerning the interactions among the variables. As Hamilton (1994, p. 291) asserts, impulse response functions and variance decompositions are used to summarize the dynamic relations between variables in a VAR system. Enders (2010, p. 380) argues that innovation accounting could help determine whether the model is adequate. Elyasiani et al. (2007) comment that the variance decomposition analysis provides an important insight into the relative importance of each variable in the system. The results of innovation accounting are sensitive to the ordering of the variables in the VAR system. Since the real ordering of the variable is unknown, the generalized approach to innovation accounting, as proposed by Pesaran and Shin (1998),

will be adopted. Unlike the traditional impulse response analysis, their approach does not require orthogonalization of shocks and is invariant to the ordering of variables in the VAR. This approach is also used in the construction of order-invariant forecast error variance decompositions.

Estimations and Analyses

Five series of output index are tested for unit roots as presented in Table 1. All the variables have unit roots in levels, while all of them are stationary in first differences regardless of the specifications as described in Models A and B in the table.

Table 1. Phillips–Perron Unit Root Tests with the Output Series of South Asian Countries: 1973–2010

	In Levels		In First Difference		
Countries:	Model A	Model B	Model A	Model B	Integration
Bangladesh	0.37	–1.42	–8.18	–8.73	I(1)
	(0.98)	(0.84)	(0.00)	(0.00)	
India	3.80	–0.72	–6.11	–7.48	I(1)
	(1.00)	(0.96)	(0.00)	(0.00)	
Nepal	0.78	–2.80	–8.64	–8.96	I(1)
	(0.99)	(0.21)	(0.00)	(0.00)	
Pakistan	–1.89	–1.10	–4.10	–4.45	I(1)
	(0.33)	(0.91)	(0.00)	(0.01)	
Sri Lanka	0.95	–2.01	–4.48	–4.54	I(1)
	(1.00)	(0.57)	(0.00)	(0.00)	

Source: International Financial Statistics (IMF, 2011).

Note: Model A includes intercept, and Model B includes both intercept and trend. The null hypothesis states that the variable has a unit root; *p*-values are shown in the parentheses under each adjusted *t*-statistic. The critical values and details of the test are presented in Phillips and Perron (1988).

Since all the variables are integrated of order one, that is, I (1), they are appropriate for Johansen cointegration tests. Table 2 presents the results of cointegration tests that indicate the presence of one cointegrating relationship among all the variables based on both the trace and maximum eigenvalue statistics. Now estimating them in a VEC model becomes necessary to unveil the coefficients of the cointegrating vector.

The cointegrating equation at the bottom of Table 3 shows that there exists a long-run output relationship among the five major economies in South Asia. When the cointegrating equation is normalized on Bangladesh, the coefficients on India, Nepal and Pakistan become strongly significant. The coefficient on Bangladesh is 1 by design due to normalization. The coefficient on India, being –0.72, is the

Table 2. Johansen Cointegration Tests with the Output Series of South Asian Countries: 1973–2010

		Option 3			Option 4		
		λ Stat	CV	CE	λ Stat	CV	CE
λ_{trace} tests:							
H_0: $r = 0$	H_A: $r > 0$	79.86	69.82	1	99.38	88.80	1
H_0: $r \geq 1$	H_A: $r > 1$	38.82	47.86		58.28	63.88	
λ_{max} tests:							
H_0: $r = 0$	H_A: $r = 1$	41.04	33.88	1	41.10	38.33	1
H_0: $r = 1$	H_A: $r = 2$	19.60	27.58		27.33	32.12	

Source: Same as in Table 1.

Note: The λ_{trace} and λ_{max} are calculated as per Johansen (1995). CV signifies critical values calculated for the 5 percent significance level. CE stands for cointegrating equation. H_0 and H_A denote the null and alternative hypotheses, respectively. Option 3 includes an intercept in the CE and the test VAR, whereas Option 4 includes an intercept and a trend in the CE without any trend in the VAR. The λ_{Trace} and λ_{Max} test statistics under both models are computed by allowing for linear deterministic trends in data. The lag length is determined by the SBC. *r* stands for the rank of the matrix, which denotes the number of the CE between the variables.

highest among others, suggesting the strongest long-run relationship in output between India and Bangladesh. The coefficient on Nepal is –0.43 that signifies a moderate long-run output relationship with others. In the cointegrating equation, the signs on other variables should be opposite to that of the normalized variable to ensure that the long-run relationship works in a positive direction among the significant variables. The negative signs before the coefficients of India and Nepal ensure that these countries move in the positive direction with Bangladesh as long as the long-run relationship in output is concerned. Pakistan's coefficient, being significantly positive, implies an opposite direction of movement in the long-run relationship with Bangladesh, India and Nepal. The coefficient being 0.24 suggests a divergence from the long-run output direction that the other three countries maintain. The coefficient on Sri Lanka is very small and insignificant, implying no role of the country in the long-run output relationship with neighbours.

The coefficients on error correction terms for India, Pakistan and Sri Lanka are insignificant, indicating weak exogeneity of these countries in the system. India, being the largest economy in the region, is expectedly exogenous to its neighbours. The exogeneity of Sri Lanka indicates that the country neither maintains long-run relationship nor participates in short-run error correction of disequilibrium. Hence, the cointegration that we found in Table 2 will not be affected if Sri Lanka is dropped from the group. The insignificant error correction term on Pakistan implies that the country does not correct any errors if disequilibrium takes place. The error correction term on Bangladesh is –0.39, which implies that the country can restore the long-run output relationship within two and half years. Nepal requires more than three years to get back on the long-run relationship if the

Table 3. Vector Error Correction Estimates with the Output Series of South Asian Countries: 1973–2010

Δ Output (*t*) of →	Bangladesh	India	Nepal	Pakistan	Sri Lanka
Regressors:					
Constant	**0.057**	**0.063**	0.016	**0.056**	**0.039**
	(0.008)	(0.025)	(0.018)	(0.015)	(0.016)
Δ output (*t*-1) of:					
Bangladesh	**–0.426**	0.149	0.262	–0.247	–0.111
	(0.087)	(0.263)	(0.193)	(0.158)	(0.170)
India	0.065	0.061	0.618	–0.219	0.078
	(0.074)	(0.224)	(0.165)	(0.135)	(0.145)
Nepal	**–0.161**	0.001	–0.273	–0.016	–0.093
	(0.066)	(0.199)	(0.146)	(0.120)	(0.129)
Pakistan	0.156	–0.227	–0.346	0.284	0.062
	(0.101)	(0.304)	(0.224)	(0.184)	(0.198)
Sri Lanka	0.134	–0.103	0.089	0.086	0.223
	(0.094)	(0.285)	(0.210)	(0.172)	(0.185)
ect (*t*-1)	**–0.391**	0.060	**0.292**	0.044	–0.043
	(0.058)	(0.174)	(0.128)	(0.105)	(0.113)
R^2	0.78	0.03	0.41	0.31	0.12

CE: ect (*t*) = Bangladesh (*t*-1) – 0.72*India (*t* -1) – 0.43*Nepal + 0.24*Pakistan – 0.01*Sri Lanka – 0.40

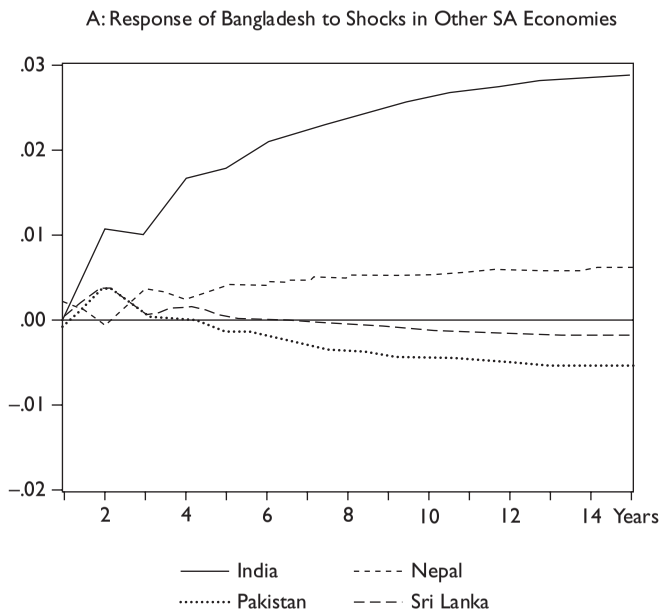
Source: Same as in Table 1.

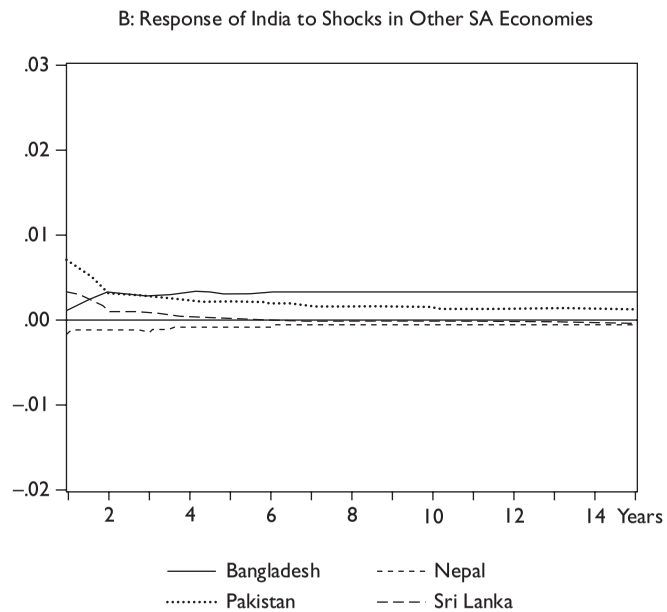
Notes: The trend term being insignificant, the error correction estimation follows Option 3 as explained in Table 2. CE stands for cointegrating equation that contains output of respective countries. Coefficients are bold when significant at the 5% level. All values in parentheses under each coefficient are standard errors. 'Δ' stands for the first-order difference operator. 'ect' stands for error correction term.

system is disturbed. Overall, the relationship between India and Bangladesh in both long-run output cointegration and short-run disequilibrium adjustment is stronger than that between any two countries in South Asia. Thus, these two countries are different from their neighbours in the region.

The constant terms in the VEC estimates in Table 3 are positive and significant for all countries except for Nepal. India, with 0.063, has the highest constant growth followed by Bangladesh (0.057), Pakistan (0.056) and Sri Lanka (0.039) over the entire sample that begins in 1973. If the sample had started in 1990, the long-run constant growth numbers would reflect the scenario of Panel B in Figure 2. A separate VEC model for that 1990–2010 subsample covering liberalization is not possible due to only 21 observations, which are inadequate for estimations.

Figure 2 shows generalized impulse responses of South Asian countries, derived from the VEC model in Table 3. Every response path has a 95 per cent confidence band consisting of the ceiling and floor. These ceilings and floors, calculated with the bootstrap method, are not presented here to avoid clutter in the





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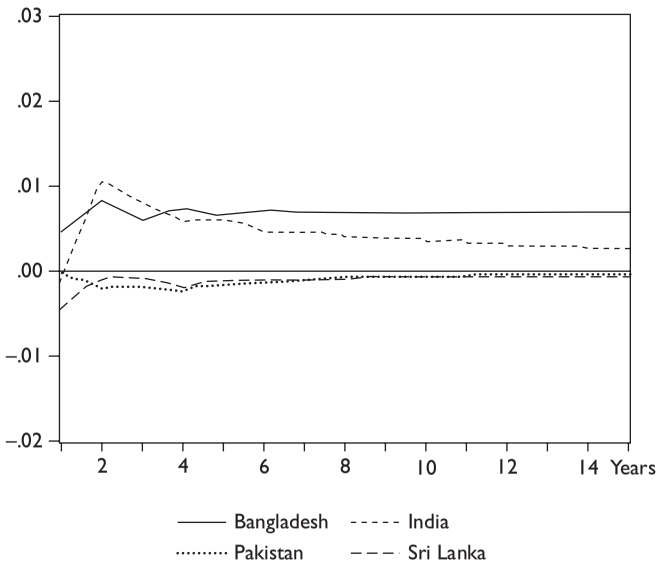
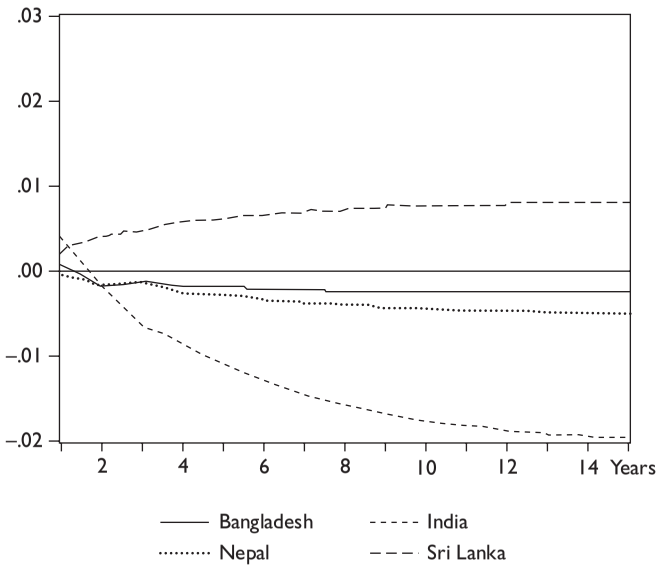
(Figure 2 continued)

C: Response of Nepal to Shocks in Other SA Economies



D: Response of Pakistan to Shocks in Other SA Economies



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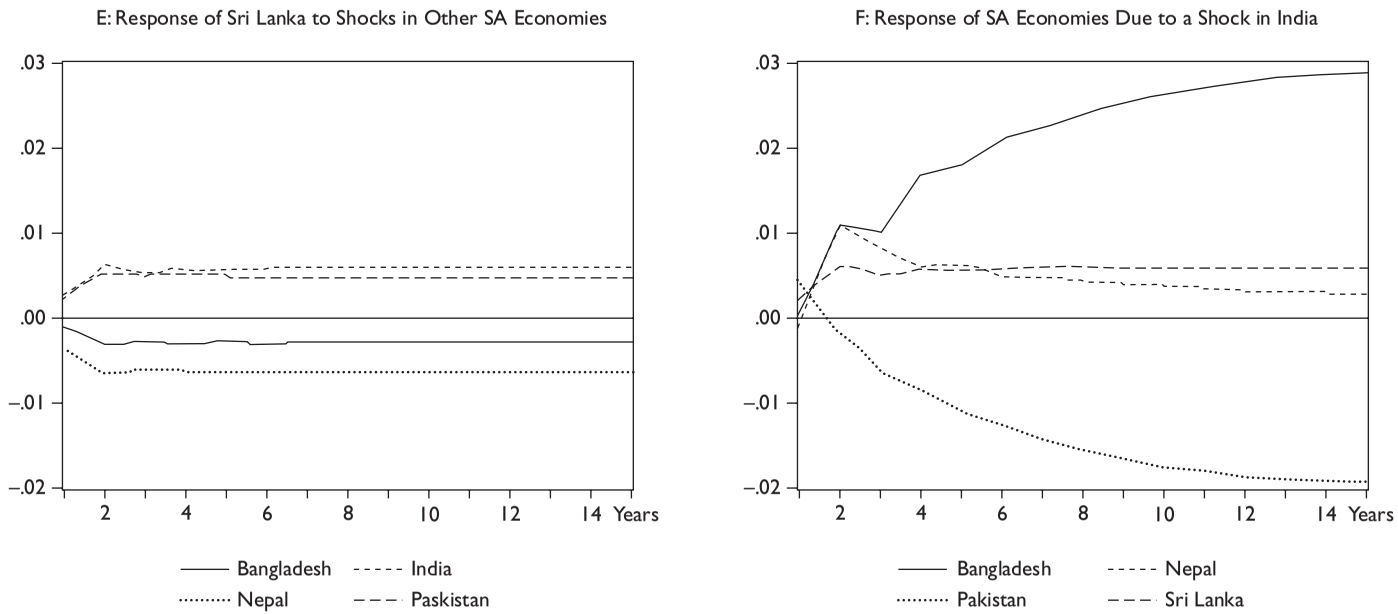


Figure 2. Generalized Impulse Responses in South Asian (SA) Countries: 1973–2010

Source: International Financial Statistics (IMF 2011).

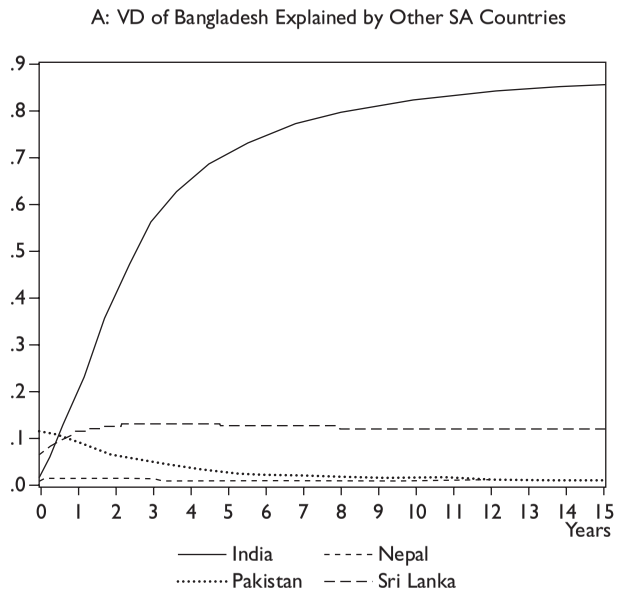
diagrams. The results on whether a response path is significant will nevertheless be mentioned in the course of discussion.

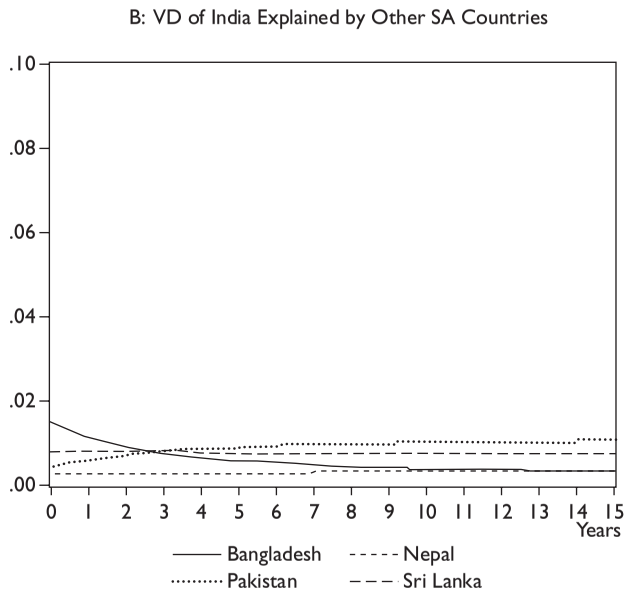
Panel A of Figure 2 shows the response paths of Bangladesh due to one SD shock in other South Asian countries. Bangladesh responds positively to India and Nepal, and negatively to Pakistan and Sri Lanka. Out of them, Bangladesh's response only to India is found to be high and significant. Although the task of discussing the underlying channels of this impulse response goes beyond the scope of this article, it can be ascertained that Bangladesh can benefit the most from the output growth of India. Growth in other neighbouring economies, however, exerts insignificant effect on Bangladesh's output performance.

Panel B of Figure 2 shows the response paths of India due to one SD shock in other South Asian countries. None of the responses are nevertheless significant, suggesting that none of the neighbours can affect India. Panels C, D and E in the same figure show responses of Nepal, Pakistan and Sri Lanka, respectively, due to shocks in their neighbours' output. All the responses in both Panels C and E, being insignificant, imply that the neighbours cannot affect either Nepalese output or Sri Lankan output. Although the outcomes apparently look similar to India's in Panel B, explanations for Nepal and Sri Lanka arguably differ from that for India. Nepal is a landlocked, small economy with a small degree of regional integration. Sri Lanka, though more open than Nepal, is still a small economy that was heavily troubled by a quarter-century long civil unrest and insurgency. Hence, the output of both Nepal and Sri Lanka is less likely to respond to that of their neighbours in a significant way. The response of Pakistan to an output shock in India is significantly negative, implying that positive growth in India translates to negative growth in Pakistan. This result, however, is consistent with the long-run equilibrium relationship as shown in Table 3. The impact of the other three neighbours on Pakistan is of no significant consequence.

In summary, Panels A through E in Figure 2 show that India is the only country that exerts significant influence on two of its neighbours: Bangladesh and Pakistan. The impacts are nevertheless diametrically opposite as shown in Panel F in the same figure. A positive output shock in Indian output delivers a positive output response in Bangladesh, while a similar response in Pakistan is significantly negative. Examining the underlying channels of these causations goes beyond the scope of this work, and thus is left for future research.

Figure 3 presents forecast error variance decompositions of South Asian countries. The confidence bands for these variance decompositions, derived with the bootstrap method, have not been imposed here to avoid clutter in the diagrams. The significance of each variance decomposition line, however, will be mentioned in the course of discussion. The variance decompositions of Bangladesh become significant only when they are explained by India, as shown in Panel A of Figure 3. India dominates a major share in Bangladesh's variance decompositions, suggesting that India is the most influential economy in the South Asian region for determining the forecast error variance of Bangladesh.





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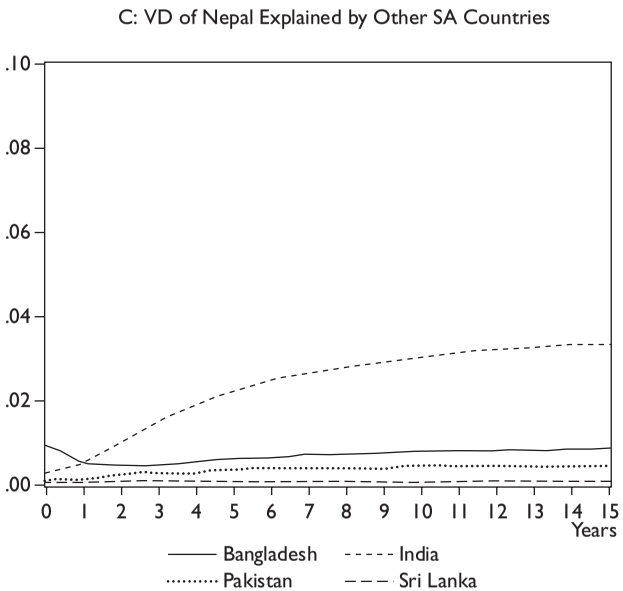

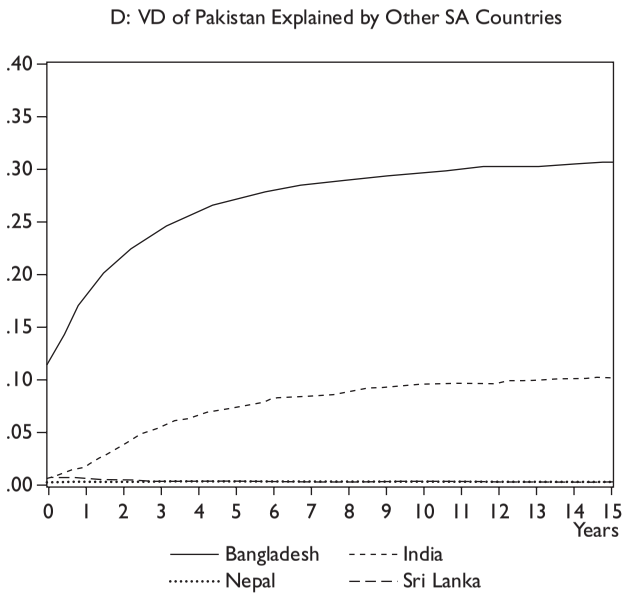

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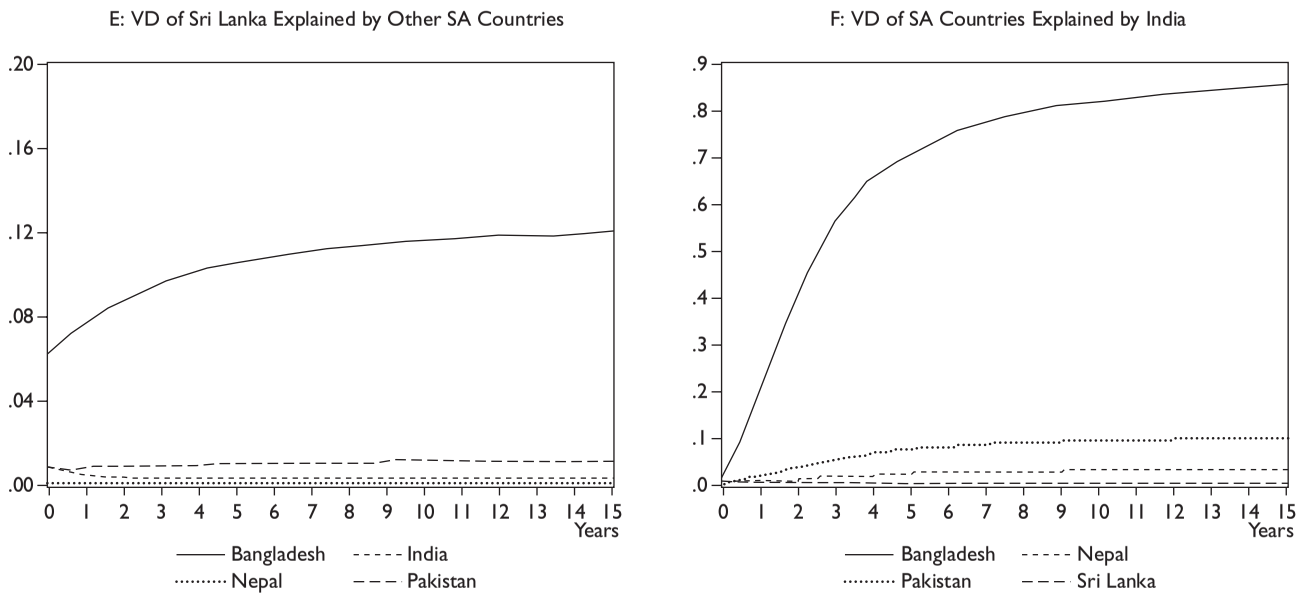

Figure 3. Generalized Forecast Error Variance Decompositions (VD) of South Asian (SA) Countries: 1973–2010

Source: International Financial Statistics (IMF 2011).

Panel B in Figure 3 shows how negligibly other countries can explain India's variance decompositions. Moreover, they all are found to be highly insignificant. This result lends credence to the outcome in Panel B of Figure 2. Although India explains Nepal's variance decompositions much more than others do, all the variance decompositions of Nepal, as shown in Panel C of the same figure, are insignificant. Panel D shows that both Bangladesh and India explain considerable portions of Pakistan's variance decompositions, but Pakistan cannot do the same for either Bangladesh or India in a significant way. Only Bangladesh can explain more than 10 per cent of Sri Lanka's variance decompositions, as shown in Panel E. Panel F compiles variance decompositions of South Asian countries explained by India to present a comparative view. India's explanatory power for Bangladesh's variance decompositions is outstandingly high, reaching more than 70 per cent in five years, and more than 80 per cent in 10 years. In comparison, India can explain only 10 per cent of Pakistan's variance decompositions in a 10-year horizon.

Based on the results in Panels D and E, Bangladesh can explain variance decompositions of Pakistan and Sri Lanka by greater amount than India can do for these nations. In summary, both India and Bangladesh play significant roles in explaining variance decompositions and impulse responses of their neighbours. Not only are these two economies strongly cointegrated to each other, they also exert maximum influence on their neighbours more vigorously than their neighbours can do on them.

Rationale behind Bangladesh's High Integration with India

In the five-country model of this article, only India and Bangladesh stand out to be different from others. To assert this outcome, there are two important points in the findings, which require economic interpretations. These points are as follows:

1. Indian output is not affected by any of its neighbours.
2. Bangladesh's integration with Indian output appears to be the strongest among others. Simply, India's output effect on Bangladesh is not only positive but also much higher than that on other neighbours, such as Nepal, Pakistan and Sri Lanka.

The first point that illustrates India's exogeneity in the model actually stems from the largest size of the Indian economy in South Asia. In this five-country model, India's output occupies more than 80 per cent of the total production in the region (WDR, 2011). While India might have responded to the output performances of its neighbours, that response had turned out to be too small to be statistically significant. Paul (2012) examines output interactions of three major economies: the US, China and India, where the US economy is extraordinarily big

enough to be exogenous in the model. Paul finds that US output does not respond to either China or India in a significant way. In the similar fashion as long as South Asia is considered, the output of India is not likely to be affected by that of its neighbours due to its outstandingly big output size in the region. Hence, India's exogenous existence in the response exercises of this study is quite plausible.

To illustrate the second point, it is necessary to understand how Bangladesh is connected with India. Abel and Bernanke (2005) assert that trade is an effective channel to transmit business cycles from one country to another. Paul (2010) shows that India's business cycle synchronization with the US has increased since the early 1990s when India embarked on liberalization, and trade acted as an important vehicle of transmission in this regard. Accordingly, Bangladesh's output response to India can be attributed to Bangladesh's voluminous and augmenting trade with India. Although all four neighbours have trade relations with India, the bilateral trade between India and Bangladesh is the highest in volume in the region. In 2010, while Bangladesh's trade with India amounted to USD 3,977 million, the corresponding figure for Sri Lanka was 3,233, Nepal 2,508 and Pakistan 1,826 in million USD (DOT-IMF, 2011). Bangladesh's cumulative trade with India since 1980 has amounted to USD 32,392 million. The corresponding figure for Sri Lanka has been 28,048, Nepal 22,607 and Pakistan 14,108 in million USD (DOT-IMF, 2011).[1] Since the trade volume of Sri Lanka and Nepal with India is on the rise, we can expect higher output responses of these two countries to India in the future.

There are other geographical factors and policy-related reasons behind Bangladesh's high output integration with India. Except for the south side of Bangladesh where the Bay of Bengal lies, Bangladesh shares a common border with India in all the rest three sides. This geographical advantage has facilitated Bangladesh's trade with India to a great extent. In addition, the timing of policy adoption for liberalization and economic openness was surprisingly the same for both countries. Both India and Bangladesh experienced a transition towards rapid privatization since the early 1980s, and both embarked on liberalization since the early 1990s through regime change.

Rodrik and Subramanian (2004) comment that the newly elected Congress government realigned itself politically with the private sector in 1980 and dropped its previous socialist stance. They assert that the next Congress regime, following its rise to power in 1984, further reinforced the previous switch to privatization in a more explicit manner. This, in their view, was the key change that unleashed the animal spirits of the Indian private sector in the early 1980s. Joshi and Little (1994) assert that the liberalization of the 1980s was not too impressive from the vantage point of the 1990s, but it was certainly faster than the funereal pace of the period from the mid-1970s to the early 1980s.

Similarly, Bangladesh experienced a major change of direction of policy in the early 1980s with the adoption of a market-oriented development strategy supported by a number of liberalizing policy reforms. In retrospect, the government policy-makers believe that liberalization in Bangladesh actually started with the

New Industrial Policy (NIP) in 1982. Islam (2007) argues that the most important move towards a privatization process in Bangladesh started with the announcement of the NIP. Mondal (2000) asserts that by promulgating this NIP, Bangladesh introduced fundamental changes to the industrial policy environment in order to promote private sector-led industrial growth.

Both India and Bangladesh experienced the second wave of liberalization in the early 1990s. Agarwal (2003) asserts that India faced its worst financial crisis in 1991. To contain the crisis and restore economic health, the new Congress government announced a package of policies in 1991, which is referred to as 'the reform' or 'liberalization' in the Indian economy (Acharya, 2001). Panagariya (2008, p. 103) asserts that the liberalization process of the early 1990s has continued to move forward at a gradual pace even to the present day. As a surprising coincidence, Bangladesh experienced a regime change in 1991 and embarked on deregulation policies to support more economic openness than before. Ahmed and Satter (2004) assert that in 1991 Bangladesh entered a new phase, which saw continued progress with deregulation and privatization but most importantly witnessed fairly rapid trade liberalization compared to the past. This sort of policy synchronization that embraced Bangladesh and India did not happen for any other pairs of countries in the region. Hence, it can be argued that the reason for Bangladesh's high output integration with India lies not only in trade but also in geographical proximity and harmony in policy regimes.

Conclusion

In the mid-1980s, South Asian countries formed a regional group, named the SAARC, which aimed at enhancing regional integration to increase output and welfare in the region. Essentially, the SAARC is not different from other regional groups that aim at achieving similar goals. It is intriguing, nevertheless, to know how far these goals have been achieved in South Asia. The existing literature on the results of how far these goals have been materialized is unclear. This work argues that output interrelationships among South Asian countries are an integral indicator to understand the level of integration and output interdependence between countries in the region.

Despite a plethora of research on South Asia, examining output relationships between countries in the region has conspicuously remained absent. This work fills that gap. In the wake of liberalization since the early 1990s, growth sparks in South Asia have raised questions on whether countries in the region maintain a long-run equilibrium relationship in output. Short-run output interaction between South Asian nations have fallen into an aspect of investigation as well. This study portrays both the long-run and short-run dynamics of output interactions in South Asia.

By collecting yearly output indices from the IFS of the IMF (2011), this work finds a long-run equilibrium relationship in output between five major South

Asian economies: Bangladesh, India, Nepal, Pakistan and Sri Lanka. While the largest economy, India, is insignificantly affected by its neighbours, it exerts maximum effects on other economies in the region. Bangladesh and India registered growth faster than other nations in South Asia in the wake of liberalization since the early 1990s. The integration between India and Bangladesh turns out to be higher than the integration between any other two countries in the group. Further, Bangladesh appears to be the second most influential country after India to exert effects on other economies like Sri Lanka and Pakistan.

Thus, India and Bangladesh become two front liners in integration and interaction with neighbouring nations. From Bangladesh's point of view, India is the most influential economy to affect both long-run and short-run output dynamics in Bangladesh in a positive direction. An emerging India has been more beneficial to Bangladesh than to other neighbours. From India's point of view, Bangladesh maintains a long-run output relationship with India more effectively than with others. Further, Bangladesh dominantly corrects any disequilibrium to restore the long-run equilibrium relationship of output in the region. Hence, the output performances of these two nations are more mutually beneficial than the output performances between any of the other subgroups in the region. This study argues that Bangladesh's voluminous and augmenting trade with India, geographical proximity and policy synchronization are the plausible channels of Bangladesh's high and positive responses to Indian output performances. Further investigations in a more rigorous way to examine the underlying channels of these mechanisms can be left for future research.

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Note

1. The cumulative trade figures begin in 1980 because the DOT data of the IMF are available since that year for South Asian countries.

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