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Does India's growth matter? Evidence from the SAARC nations

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Abstract

The study estimates the extent of spillover effects that India's real per capita gross domestic product (GDP) growth rate has on the growth rates of other countries in the South Asian Association for Regional Cooperation (SAARC) region for the period 2003–2016. It also identifies whether the conventional trade channel is the means through which growth is transmitted from India to her neighboring countries. Using a random effects model, we conclude that on average, a 1 percentage point increase in India's real per capita GDP growth rate results in 0.46 percentage point increase in the per capita GDP growth rates of other SAARC nations. However, this does not occur through the trade channel primarily due to low levels of intraregional trade. Also, using time dummies, the paper analyzes whether there has been any significant change in the degree of spillover effects in the postfinancial crisis period, where countries have been observed to insulate themselves to a certain extent.

1 INTRODUCTION

In this globalized world, trade has become indispensable for the growth of any economy. According to the gravity model of trade, nations that are geographically close to each other should experience a higher volume of bilateral trade, whereas in certain economies the pattern of trade is based on the principle of comparative advantage. Additionally, there have also been economic unions and trade agreements among nations to foster trade and growth as a symbiotic relationship. Grossman and Helpman (1991) studied the relation between trade and growth through the lens of knowledge spillover. Comparing local knowledge with a public good, knowledge can be easily transferred, and hence there is a possibility of innovation and technological spillover among trading nations.

Vamvakidis and Arora (2001) studied the relationship between trade openness and growth and inferred that the positive relationship has spurred only in recent years.

Whereas the South Asian Association for Regional Cooperation (SAARC) union was formed in the year 1985, the South Asian Free Trade Area was formulated in the year 2006 to reduce tariff rates and eliminate nontariff

barriers in an intraregional trade regime. The SAARC comprises 24% of the world's population, 3% of the global area, and approximately 9% of the global economy in terms of gross domestic product (GDP).¹¹

Although the SAARC is an economic union, it is essential at this point to understand that the macroeconomic fundamentals of all the nations under this union are quite different from each other. For instance, whereas the fiscal deficit of Pakistan and Maldives is quite high and prone to external economic shock, the fiscal position in Bangladesh and India is under control with proper policies in place. In terms of the current account deficit, Maldives incurred a very high current account deficit of almost 51% of the GDP in the year 2008.² In the same year, Bangladesh and Nepal had a current account surplus.

Convergence has always been a very important issue for most developing economies all around the world. It is postulated that the poorer economies experience higher per capita growth rates than the developed economies, which in the long run helps to reduce inequality. At present, India is the fastest growing country among the SAARC nations, growing at a rate of almost 7% year on year. To ensure that the growth rate of the SAARC nations is in tandem with the growth rate of other countries around the globe, it is inevitable that the other nations start having sustainable measures to foster growth.

The average growth rates in the South Asian nations have been close to 7%, as shown in Figure A1 of the appendix, over the last 20 years, which is twice the global average and over three times that of the European Union (EU) economy.

Trade is considered to be a very important engine for growth, and major reductions in tariffs lead to liberalization of trade leading to growth. Some of the policies like South Asian Preferential Trade Agreement help in boosting the development of these economies. However, there is still a debate on the level of tariff and the structure of trade among economies. Neary (1998) studied the South Asian economies to understand whether the presence of unilateral, bilateral, or custom unions help these economies with respect to trade liberalization. Trade openness among the SAARC nations has always been one of the top priorities for economic development. Whereas Maldives has a very high trade dependency, and hence a very high trade–GDP ratio, a country like India has a huge domestic sector, and hence has a moderate level of trade to GDP ratio. The trade openness data has been given in Table A1 of the appendix.

India is not only the dominant country with regard to its macroeconomic parameters, but also the most diversified economy in the region. Table A1a and A1b depict the extent of exports and imports of India and the SAARC region. In terms of value of exports, it is seen that Sri Lanka is the major trading partner among all SAARC countries. In terms of imports too, India imports the maximum (in value) from Sri Lanka, followed by Bangladesh. Although the value of trade tells us that Sri Lanka and Bangladesh are India's major trading partners, it would be worth seeing the nature of trade between these countries. Whereas India majorly exports mineral oil, motor vehicles, cotton, and pharmaceutical products, the major importing products for

¹ <http://ficci.in/international.asp?deskid=54522>

² World Bank database

India from Sri Lanka are spices and natural rubber. In this paper, we study the leverage effect of India's growth on the growth of other nations in the region. Using a panel data model over the period of 2003–2016, the study analyzes the effect of certain macroeconomic variables such as population growth rate, investment, government consumption, trade, and a host of other factors on per capita growth of the SAARC nations.

The remaining part of the paper has been organized in the following manner. Section 2 discusses the related literature on spillover effects. Section 3 discusses the methodology used to analyze the data, whereas Section 4 discusses the data in greater detail. Finally, Section 5 presents the results of the study, and Section 6 concludes the findings. The limitations of our study and the scope for future research are also discussed in brief at the end of the paper.

2 LITERATURE REVIEW

The study focuses on the spillover effect of growth among the SAARC nations. In particular, this study attempts to understand whether India's growth has an effect on the growth rate of other SAARC nations. The extent of spillover among nations has always been an area of considerable interest. Given business cycle fluctuations, a lot of common international factors affect national output (Bordo & Helbling, 2011).

Convergence has been one major issue that has been discussed in depth with regard to trading partners and neighboring economies. Convergence on per capita income is based on a lot of economic and noneconomic factors. Whereas technology is one indispensable factor to fasten convergence across economies, trade openness is another vital factor in understanding how the convergence process takes place. Although the South Asian Free Trade Area has been in place for more than a decade now, skeptics argue that the level of intraregional trade is extremely low, and thus the magnitude of spillover might not be substantial.

Zhang and Felmingham (2002) studied the reasons for intraregional spillover in China during the year 1984 to 1988. The major reasons cited in the study for the spillover effect were inward foreign direct investment, export expansion, and domestic investment. Additionally, the study also concluded that for Western China, which is more labor intensive, labor expansion has a positive effect on growth. However, there have been a vast majority of cross-country studies that have measured the degree of spillover among economies.

Arora and Vamvakidis (2005) studied the effect of spillover growth from South Africa to other African countries for the time period 1960–1999 using fixed effects panel regression. The study discusses how growth in South Africa is significant to the growth of other countries in sub-Saharan Africa. The paper also tests for robustness results by checking for a different time period and using time fixed effects. Another study by Obiora (2009) analyzed the spillover effect of the EU and Russia towards the Baltic countries. Using a vector autoregression model (VAR), the study shows how the most important linkages for growth spillover were mostly through trade and financial linkages. In particular, the EU had a greater impact on the Baltic countries than Russia. In a more recent study by Cashin, Mohaddes, and Raissi (2017), the authors employ a global

VAR model and estimate that a 1% permanent negative GDP shock in China has significant macroeconomic repercussions globally, with world growth reducing by 0.23 percentage points in the short run. The above papers are quite alike in flavor, and our methodology is much similar to the one employed by Arora and Vamvakidis (2005).

Besides the purely economic factors that result in spillover, another strand of literature has looked into how the fundamentals of an economy such as technological innovations, governance, and entrepreneurship can affect the growth prospects. Market failure and low quality of governance can lead to delayed convergence. Coe and Helpman (1995) studied the impact of spillovers due to innovation in research and development (R&D). Studying the effect of domestic and foreign countries' R&D stock on total factor productivity, the paper concluded that foreign R&D capital stocks have in particular large effects on the smaller economies. Hayami (1997) demonstrates, with cross-country comparisons and historical data, those fundamental country-specific factors such as governance, institutions, and culture play a dominant role in determining the growth path of a country. A study by Stuetzer et al. (2017) measures how the culture of entrepreneurship affects the employment and growth prospects in different regions of the US. Constructing a measure of culture for entrepreneurship and using ordinary least squares regression, the empirical evidence suggests that those regions exhibiting higher levels of entrepreneurship culture tend to exhibit better economic performance and also have higher employment growth.

Keeping in mind the literature that has been covered in this broad area, the paper sheds light on the spillover effect of India's growth on the rest of the SAARC nations during the period of 2003–2016. The paper also identifies whether the growth transmission occurs through the more conventional trade channel by making use of an interactive term. A separate analysis is conducted for the countries with significantly high trade shares with India, namely Bhutan and Nepal, and identifies whether the spillover effect for these countries is through the trade channel. Finally we introduce time dummies in the model to investigate whether there has been any significant change in the growth transmission channel in the postfinancial crisis period.

3 METHODOLOGY

The empirical framework that has been employed in the paper follows the standard literature on growth theory. The study estimates India's growth spillover effects on other SAARC countries for the time period 2003–2016. Thus the dependent variable in our study is per capita real GDP growth rate of the countries concerned, whereas the independent variable is India's per capita real GDP growth rate (both variables being measured in constant 2010 US dollars). Several other explanatory variables, which can possibly account for per capita real GDP growth in a country, are also included in our model. The list of control variables includes the following:

- Convergence (logarithm of real per capita GDP in the initial year of the period under study),
- Demographics (annual population growth rate),

- Investment (gross capital formation as a percentage of GDP),
- Level of education (secondary school enrollment in gross percentage terms),
- Government consumption (general government final consumption expenditure as a percentage of GDP), and
- Trade openness (the sum of exports and imports of a country as a fraction of GDP).

In addition to the above regressors, we also include

- An interactive term, namely India's real per capita growth rate times India's share in total trade of a country, to identify whether the spillover effect takes place through the trade channel; and
- A time dummy to infer whether there has been any change in growth transmission channel in the pre financial crisis and post financial crisis period.

Thus we estimate the model

Real per capita GDP growth rate_{it} = convergence_i + population growth rate_{it} + investment_{it} + government consumption_{it} + trade_{it} + India's real per capita GDP growth rate_{it} + (India's real per capita GDP growth rate*share of India in total trade)_{it} + Time dummy + u_{it}.

To begin with, we run a pooled OLS regression without taking into effect the panel structure of the data set. However, there is an efficiency argument for choosing a fixed effects or random effects model over pooled OLS because the latter does not take into account the cross equation correlation between the error terms. Also, if there is unobserved heterogeneity, which is correlated with the regressors in our model, the pooled OLS estimates shall not be consistent. Hence we run a Durbin–Wu–Hausman (Hausman, 1978; Wu, 1973) test to infer whether the data fits a fixed effects model or a random effects model better.

We then use various model specifications to conclude whether there is any spillover effect. The baseline model regresses per capita real GDP growth rate of the concerned countries on the per capita real GDP growth rate of India. Additionally, several explanatory variables are added to the model, including the interaction term, to identify the main determinants of growth. Finally, the time dummy is added to infer whether there has been any significant change in the postfinancial crisis period.

To check for the robustness of our analysis, we finally run the same model specifications for Bhutan and Nepal. Because Nepal and Bhutan enjoy a significantly larger trade share with India compared with the other five countries in the SAARC region, we estimate whether the spillover effects for these two countries occurs through the trade channel.

4 DATA

The time period of our study is 2003–2016. The data for the economic indicators have been obtained from the World Bank³ database whereas value for trade openness and volume of trade are available on the United

³ <http://data.worldbank.org/>

Nations Conference on Trade and Development World Integrated Trade Solution (UNCTAD WITS)⁴ database.

However, there are a lot of missing data points for Maldives. Also, Maldives is a hugely open economy and can be considered as an outlier with regards to its value of trade openness when compared with the other SAARC nations. Including Maldives in our panel regression analysis would thus lead to biased estimates and may wrongly lead to the conclusion that the growth transmission in the region occurs through the trade channel. Hence we have opted the country out of our analysis. Also, for the economic indicator secondary school enrollment, there are missing data points for all countries. We have also been unable to obtain the same from other secondary sources. Hence data unavailability had led us to exclude secondary school enrollment from our analysis.

The trade data has been obtained from the UNCTAD WITS database. However, it must be borne in mind that there are missing trade data for the smaller countries, namely, Bhutan and Nepal. In such a case, we had to obtain mirror data.⁵

The detailed summary statistics of all the variables and the correlation matrix of the explanatory variables in our study have been presented in Tables A2 and A3 of the Appendix, respectively.

5 RESULTS

We initially run a pooled OLS regression without taking into consideration the panel dimension of the data set. The results of the pooled OLS regression have been depicted in Table A4. We observe that India's growth has good explanatory power for growth in real per capita incomes in the neighboring countries. To be more precise, a 1 percentage point increase in India's real per capita GDP growth rate results in 0.47 percentage point increase in the real GDP growth rate of the other SAARC countries. Also, this spillover effect does not take place through the trade channel as the coefficient of the interactive term does not turn out to be significant. However, as discussed earlier, the pooled OLS regression ignores the cross equation correlations, and there is an efficiency argument in favor of using either a fixed effects or a random effects model.

Therefore, we run the Durbin–Wu–Hausman test to identify whether the data fits a fixed effects model or a random effects model better. From the results of the Durbin–Wu–Hausman test, we fail to reject the null hypothesis and therefore conclude that the random effects model fits the data better.

⁴ <http://wits.worldbank.org/>

⁵ While obtaining the volume of bilateral trade on UNCTAD WITS database, one needs to choose the reporting country, the partner country, and type of trade flow. For example, while trying to obtain the value of Bhutan's exports to India, one must select Bhutan as the reporting country and India as the partner country and type of trade flow as exports. However, trade data is unavailable for Bhutan as the reporting country in recent years. Hence, to obtain mirror data, we choose India as the reporting country, Bhutan as the partner country, and type of trade flow as imports.

We try various model specifications before arriving at our final results. The baseline model regresses per capita real GDP growth rate of the neighboring countries against India's real per capita GDP growth rate. As can be seen from Column 1 of Table A5, India's real per capita GDP growth rate is significant for the growth rates of her neighboring countries, with a 1 percentage point increase in India's growth rate resulting in the other countries' growth rate increasing by 0.38 percentage points.

We then include several other explanatory variables that are endogenous to the GDP growth rate of any economy to determine the extent of spillover effects (Column 2 of Table A5). There continues to be significant spillover effects with a 1 percentage point increase in India's real per capita GDP growth rate resulting in 0.48 percentage point increase in the per capita GDP growth rate of the other countries. However, the spillover effect does not take place through the trade channel. The effects are also much subdued compared with other parts of the world, where a 1 percentage point increase in South Africa's growth rate results in 0.5–0.7 percentage point increase in the growth rate of the rest of Africa (Arora & Vamvakidis, 2005), and a 1 percentage point increase in China's growth rate translates into 0.5 percentage points increase in the growth rates of her neighboring countries (Arora & Vamvakidis, 2005). The coefficients of the other variables are very much in accordance with the standard literature with the coefficients for convergence, population growth, government consumption, and interaction effect being negative, though none of these variables are significant. However, trade openness of a country has a positive coefficient and is also significant in explaining the growth rates of the countries.

In the final specification, we include time dummies to observe whether there has been any change in the growth transmission channel in the postfinancial crisis period. (Column 3 of Table A5). There continues to be similar significant spillover effects. However, the coefficient of the time dummy is not significant, indicating that there has not been much change in the growth transmission channel in the postfinancial crisis period.

We finally run the same model specifications for the countries of Bhutan and Nepal, which enjoy significantly higher trade shares with India as compared with Afghanistan, Bangladesh, Pakistan, and Sri Lanka, and estimate the extent of spillover effects (Table A6).

The baseline model reveals that India's per capita GDP growth has significant spillover effects with 1 percentage point increase in India's per capita GDP growth rate translating into 0.52 percentage point increase in the growth rates of the two countries. As we add more explanatory variables to our model, we observe that the coefficient of the interaction term is positive and statistically significant, which essentially means that the spillover effect takes place through the trade channel for Bhutan and Nepal. However, the coefficient for India's real per capita GDP growth is negative and statistically insignificant. The coefficient for trade openness is also positive and statistically significant. Therefore, we can conclude that for Bhutan and Nepal, which enjoy considerably high trade shares with India, the spillover effect primarily occurs through the trade channel.

6 CONCLUSION

Using a random effects model, we thus observe that India has significant spillover effects on other countries in the SAARC region. On an average, a 1 percentage point increase in India's real per capita GDP growth rate results in an increase of 0.46 percentage point in the real per capita GDP growth of her neighboring countries. But this is still low when compared with the spillover effects that South Africa has on the sub-Saharan region and China has on her neighboring countries. This could be attributed to a host of factors such as low levels of intraregional trade and political tension in the region. The extent of trade between India and the nations in the SAARC region is quite low, hence trade is not a significant channel through which the spill over occurs. Having run the same model specifications separately for Bhutan and Nepal, we observe that there are still significant spillover effects from India to these two countries, but in this case it takes place through the conventional trade channel. Finally, introducing time dummies in our model, we conclude that there has not been any significant change in the extent of spillover effects in the postfinancial crisis period. As discussed in the literature, a future direction of research can extend beyond the trade channel and look into the role of financial linkages in generating spillover effects. This could be either in the form of foreign direct investment or through remittances, which are generally considered to be high in the subregion. Because the spillover channel of trade is not significant, future research can identify the exact mechanism of growth transmission and explore the alternative channels. Also, with richer data sets, we can include Maldives in the panel regression analysis that will help us perceive the overall extent of spillover effects within the SAARC. Finally, the study can be further enriched by making use of spatial econometric models, a growing body of literature, which accounts for spatial dependence among economies by incorporating a spatial weight matrix. In our study, the weight matrix could be constructed based on the average value of bilateral trade between two countries, which will mimic the economic distance between two economies more accurately. This would be able to capture the extent of growth transmission through the trade channel more precisely.

6.1 Implications and policy recommendations

Because elimination of trade barriers results in increased trade openness, thus aiding in the well-being of a nation, it is imperative that the volume of intraregional trade within the SAARC increases. This is apparent from our study because the coefficient of trade openness is positive and statistically significant. The fact that India's per capita growth generates positive spillover on the other SAARC nations, but its magnitude is comparatively low as compared with the effect that other big countries have on their neighbors in other parts of the globe, can be rectified through increased bilateral and multilateral trade flows. The economies in the region specialize in a wide variety of goods and services, and an improved trade environment can only boost the growth prospects of the region.

Also, increased trade openness is easier to achieve than improving certain macroeconomic fundamentals of the economy such as the investment climate or the literacy rate, which are path-dependent processes. With increased bilateral and multilateral trade in the region, India can exert a greater spillover effect on the other SAARC nations. Finally, the governments of all countries should also focus on improving their socioeconomic performance, because factors like literacy rate and consumer confidence also play an

instrumental role in building an enabling trade and investment climate, which in turn would boost the growth prospects of a country.

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References

- Arora, V., & Vamvakidis, A. (2005). The implications of South African economic growth for the rest of Africa. *South African Journal of Economics*, 73(2), 229– 242. <https://doi.org/10.1111/j.1813-6982.2005.00015.x>
- Bordo, M. D., & Helbling, T. F. (2011). International business cycle synchronization in historical perspective. *The Manchester School*, 79(2), 208– 238. <https://doi.org/10.1111/j.1467-9957.2010.02236.x>
- Cashin, P., Mohaddes, K., & Raissi, M. (2017). China's slowdown and global financial market volatility: Is world growth losing out? *Emerging Markets Review*, 31, 164– 175. <https://doi.org/10.1016/j.ememar.2017.05.001>
- Coe, D. T., & Helpman, E. (1995). International R&D spillovers. *European Economic Review*, 39(5), 859– 887. [https://doi.org/10.1016/0014-2921\(94\)00100-E](https://doi.org/10.1016/0014-2921(94)00100-E)
- Grossman, G. M., & Helpman, E. (1991). Trade, knowledge spillovers, and growth. *European Economic Review*, 35(2–3), 517– 526. [https://doi.org/10.1016/0014-2921\(91\)90153-A](https://doi.org/10.1016/0014-2921(91)90153-A)
- Hausman, J. A. (1978). Specification tests in econometrics. *Econometrica: Journal of the Econometric Society*, 46, 1251– 1271. <https://doi.org/10.2307/1913827>
- Hayami, Y. (1997). *Development Economics*. Clarendon Press: Oxford.
- Jain, R., & Singh, J. B. (2009). Trade pattern in SAARC countries: Emerging trends and issues. *Reserve Bank of India Occasional Papers*, 30(3), 73– 117.
- Neary, J. P. (1998). Pitfalls in the Theory of International Trade Policy: Concertina Reforms of Tariffs, and Subsidies to High-Technology Industries. *Scandinavian Journal of Economics*, 100(1), 187– 206.
- Obiora, K.I. (2009). Decoupling from the east toward the west? Analyses of spillovers to the Baltic countries. *International Monetary Fund*.

Stuetzer, M., Audretsch, D. B., Obschonka, M., Gosling, S. D., Rentfrow, P. J., & Potter, J. (2017). Entrepreneurship culture, knowledge spillovers and the growth of regions. *Regional Studies*, 1– 11.

Vamvakidis, A., & Arora, V. (2001). The impact of US economic growth on the rest of the world. *Journal of Economic Integration*, 1(119), 1– 26.

Wu, D. M. (1973). Alternative tests of independence between stochastic regressors and disturbances. *Econometrica: Journal of the Econometric Society*, 41, 733– 750. <https://doi.org/10.2307/1914093>

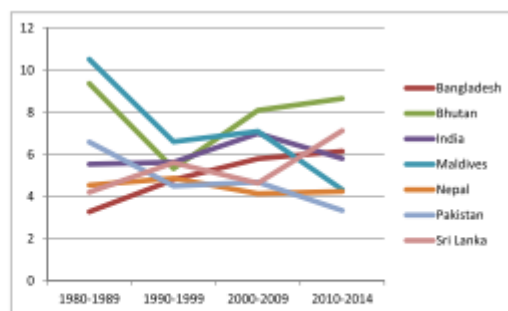
Zhang, Q., & Felmingham, B. (2002). The role of FDI, exports and spillover effects in the regional development of China. *Journal of Development Studies*, 38(4), 157– 178. <https://doi.org/10.1080/00220380412331322451>

Biographies

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Appendix A



Source: Jain, Rajeev, and J. B. Singh. "Trade pattern in SAARC countries: Emerging trends and issues." *Reserve Bank of India Occasional Papers* 30.3 (2009): 73-117.

FIGURE A1 Growth rates of South Asian Association for Regional Cooperation countries

TABLE A1 Trade openness in South Asian Association for Regional Cooperation countries

Countries	1970	1980	1990	2000	2008	2016
Afghanistan	21.7	–	–	87	55	55.9
Bangladesh	20.8	23.4	19.7	33.2	47	39.8
Bhutan	–	50.4	56.7	76.2	146	82.8
India	7.8	15.6	15.7	27.4	54	39.8
Maldives	–	358.7	168.1	161.1	173.4	155
Nepal	13.2	30.3	32.2	55.7	45	48.8
Pakistan	22.4	36.6	38.9	28.1	34	25.13
Sri Lanka	54.1	87	68.2	88.6	63	48.8

Source: Jain, Rajeev, and J. B. Singh. "Trade pattern in SAARC countries: Emerging trends and issues." *Reserve Bank of India Occasional Papers* 30.3 (Jain & Singh, 2009): 73–117; World Bank database.

TABLE A1A Value of exports from India to South Asian Association for Regional Cooperation nations

Countries	2010	2011	2012	2013	2014	2015	2016
Afghanistan	220,362.7	192,084	242,911.61	256,913.51	287,887.6	258,129	343,603
Bangladesh	1,150,106.8	1,475,247	1,838,669	2,798,257	3,741,126	3,944,038	3,952,724
Bhutan	56,085.3	80,151.85	110,440	126,739	215,494	205,102.7	306,807.7
Nepal	725,131.5	987,080	1,313,024	1,680,555	2,177,023	2,785,909.7	2,572,363.7
Sri Lanka	1,028,960.8	1,595,089	2,095,145	2,168,769	2,764,366	4,103,801.1	3,465,183.3

Note. Values in INR lacs.

TABLE A1B Value of imports of India from South Asian Association for Regional Cooperation nations

Countries	2010	2011	2012	2013	2014	2015	2016
Afghanistan	59,040.3	66,202.4	64,285.5	86,097.1	128,759.2	161,292.04	202,947.8
Bangladesh	120,528.1	203,138.3	279,636	346,792.6	290,332.8	379,440.8	476,707.2
Bhutan	72,298.5	91,735.6	97,357.1	89,244.6	91,932.9	91,527.9	182,684.9
Nepal	214,646.3	233,895	263,933	295,806.5	320,429.6	391,549.7	306,935.08
Sri Lanka	185,001.5	227,873.4	303,660.4	340,419.7	406,445.16	464,275.9	485,357.8

Note. Values in INR lacs.

TABLE A2 Summary statistics of the variables

Variable	Number of observations	Mean	Standard deviation	Skewness	Kurtosis
Real per capita gross domestic product (GDP) growth rate (dependent variable)	84	4.009728	3.247069	1.301822	7.558328
Convergence	84	6.670646	0.5961882	0.2944289	1.579283
Population growth rate (annual %)	84	1.754347	0.8794955	1.152668	4.27207
Investment (% of GDP)	84	29.44752	12.91114	1.217394	3.990644
Government consumption (% of GDP)	84	11.33337	4.600726	0.6731581	2.687344
Trade openness (% of GDP)	84	46.97005	18.44431	1.366955	3.816789
Share of India in trade * India's real per capita GDP growth rate	84	1.741551	1.964656	1.050232	2.636482
India's real per capita GDP growth rate	84	6.215914	1.617039	-0.6643286	3.233796
Time dummy	84	0.5	0.503003	0	1

TABLE A3 Correlation matrix between explanatory variables.

	Convergence	Population growth rate	Investment (% of gross domestic product [GDP])	Government Consumption (% of GDP)	India real per capita GDP growth rate	Trade openness (% of GDP)	Share of India in trade* India's real per capita GDP growth rate	Time dummy
Convergence	1.000							
Population growth rate (annual %)	-0.432	1.000						
Investment (% of GDP)	0.434	-0.244	1.000					
Government consumption (% of GDP)	0.451	0.236	0.585	1.000				
India's real per capita GDP growth rate	-0.000	0.030	-0.029	0.014	1.000			
Trade openness (% of GDP)	0.496	0.031	0.759	0.785	0.010	1.000		
Share of India in trade * India's real per capita GDP growth rate	0.183	-0.171	0.745	0.561	0.228	0.618	1.000	
Time dummy	0.000	-0.130	0.146	-0.079	-0.12	-0.070	-0.009	1.000

TABLE A4 Results of pooled OLS regression

Growth in real per capita gross domestic product (GDP)	Coefficient	Standard error	t-statistic	p-value	95% confidence interval	
Convergence	0.4035	0.3381	0.12	0.905	-0.6330	0.7137
Population growth rate	-0.5821	0.4427	-1.32	0.192	-1.4638	0.2995
Investment	0.0308	0.0559	0.55	0.583	-0.0805	0.1420
Government Consumption	-0.0908	0.1385	-0.66	0.514	-0.3667	0.1851
Trade Openness	0.0625	0.0385	1.63	0.108	-0.0141	0.1391
Trade Share * India's per capita GDP growth rate	-0.3223	0.3224	-1.00	0.320	-0.9651	0.3192
India's real per capita GDP growth	0.4691	0.2360	1.99	0.050	-0.0007	0.9390
Time Dummy	-0.8257	0.7234	-1.14	0.257	-2.266	0.6152

TABLE A5 Random effects panel regression with all countries

Growth in real per capita gross domestic product (GDP)	(1)	(2)	(3)
Convergence	–	-0.2475 (0.805)	-0.2948 (0.768)
Population growth rate	–	-0.7277 (0.263)	-0.7506 (0.247)
Investment	–	0.0108 (0.841)	0.0303 (0.590)
Government consumption	–	-0.0672 (0.671)	-0.0642 (0.684)
Trade openness	–	0.0738 (0.057)	0.0652 (0.098)
Trade share * India's per capita GDP growth rate	–	-0.3196 (0.355)	-0.3673 (0.290)
India's real per capita GDP growth	0.3827 (0.068)	0.4794 (0.044)	0.4657 (0.050)
Time dummy	–	–	-0.8523 (0.244)
Wald chi ²	3.34	12.42	13.84

Note: The numbers in parentheses indicate the p-values.

TABLE A6 Random effects panel regression with Bhutan and Nepal

Growth in real per capita gross domestic product (GDP)	(1)	(2)
Convergence	–	-2.695 (0.496)
Population growth rate	–	2.892 (0.187)
Investment	–	0.0294 (-0.1143)
Government consumption	–	-0.6890 (0.244)
Trade openness	–	0.1577 (0.016)
Trade share * India's per capita GDP growth rate	–	2.539 (0.038)
India's real per capita GDP growth	0.5212 (0.089)	-1.331 (0.132)
Wald chi ²	2.90	19.19

Note: The numbers in parentheses indicate the p-values