Economic Growth and Development in India and SAARC Countries

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Abstract

Momentum of economic growth in India and other South Asian economies is analysed based on stylized facts of these economies along with trends of their fiscal, monetary, trade, education and income distribution policies. Macroeconomic, general equilibrium, trade and game theoretic models have been identified that could be applied to analyse micro, macro and sectoral issues of economic growth. Achieving higher rates of economic growth requires more systematic and scientific analysis of potentials, existing strengths and comparative advantages of these economies so that they can march ahead in the growth competition in the global economy. Policies should be consistent and comprehensive to link various sectors, regions and nations in this road for long run growth. A strong pro-growth government in India with a good vision for the regional integration and development is instrumental in turning this region as another example of economic miracles in the global economy within the next few decades. By maintaining average 8 percent growth, it is possible that India will catch up the countries in the Western Europe in per capita income within a generation. Other SAARC members may be able to converge to India in per-capita income if they are able to become more stable and ready to march single-minded on the highway of economic growth.

1   1.Introduction

Election of pro-growth Modi government in India in May 2014 and initiation of growth oriented policies have raised optimism not only in India but also in all South Asian countries. India counts for about 80 percent of GDP and population of South Asia. It is growing rapidly since pro-liberalisation policies were adopted in 1991 and is promising to be the next growth miracle from Asia with continueing reforms in economic policies put by the current government. India also has shown keen interest in harnessing the natural and human resources for economic development of the regions by taking international initiatives in establishing the BRICS Bank, concept of trans-Himalayan growth axis, road, rail and information networks to strengthen SAARC regional economic cooperation. It has provided vision and leadership for growth.

It has taken more than seven decades to come to this point. Many argue that about six decades were lost in process of finding right ideas, philosophies and techniques required for speedy economic growth in India. It is still the case in neighboring countries Afghanistan, Pakistan, Nepal and Sri Lanka. India can contribute to create atmosphere for structural changes and development of economic and social institutions required for such growth through out the region. The actions for liberalisation and economic reforms now being discussed and expected to be implemented in near future can have far reaching and more transformative effects for the long run growth than those implemented in 1990s.

By maintaining average 8 percent growth, it is possible that India will catch up the advanced countries in the West and the East in per capita income within a generation. Other SAARC member countries, may be able to converge to India in per-capita income taking appropriate actions to create stable institutions and socioeconomic conditions required for growth. By the size of the economy and manpower-strength, India is the centre of the economic gravity with seven smaller economies surrounding it. Considering the growth success story of China since 1980s, which is in the eastern neighborhood of this region, it is very essential and beneficial to India to have an integrated approach for the development of these countries in South Asia. Modi's HIT-ways, highways, information technology and transmission ways, focus for the region is a timely and visionary initiative to spur economic growth. In an address on the Independence Day 2014 he had proposed new strategies including i) "no defect" and "zero effect" approach to sustainable growth of manufacturing, ii) a model village in each constituency and development of smart cities iii) new initiative for expanding bank accounts to million of poor households, iv) massive investment on skills and sanitation iv) fight against poverty in all SAARC countries and v) an open approach to the foreign direct investment or "make in India" movement. Bold steps have been taken including implementation GST and degitisation of the payment system to fulfill these.

Objective of this paper is to identify models that are essential for analysis of growth trajectories that may fit well to emerging stylized facts of the South Asian economies based on time series data and relevant literature. Section 2 explains the structural features of markets of this region; indicators of economic policies are discussed in section 3. Growth

models have been simulated for eight countries simultaneously in section 4 followed by empirical correlations and panel regression analysis of growth of this region in section 5. A brief discussion of macroeconomic models useful for analysis of stability, growth and redistribution are presented in section 6 followed by conclusions and recommendations in section 7.

Several strategic points for growth emerging from analysis of facts and model based analysis in this study are worth considering in this context which are as follows:

1. Given that 20 percent of the global population is residing in the South Asia, this region should push for growth and increase its share of global GDP up to 20 percent from roughly 6.5 percent in 2014.

2. Such growth requires increasing the ratio of saving and investment about 10 percent above the current averages around 35 percent.

3. Process of structural transformation should continue so that output and employment increases substantially in industrial and services sectors and till both output and employment in the agriculture sector are less than 5 percent from around 17 and 50 percent in recent years.

4. Such transformation will occur as this region moves towards urbanisation so that about 90 percent of the population in this region starts living in urban area with facilities. Building mega smart cities like this will create not only employment but also income. It also will gradually free up rural lands for more scientific cultivations and other meaningful economic uses.

5. On manpower issues it is important to reduce the student teacher ratio from 40 to close to 16 to raise the quality of education and cognitive skill among children. This is essential for human capital required for science and technology and for improving the PISA scores.

6. Revenue and spending of government should balance at least in the medium term and debt to GDP ratio should not increase over 50 percent of GDP; the size of the public sector should not be over 30 percent of GDP.

7. Trade ratio should increase to around 100 percent from the 50 percent at this time. Free trade regimes can enhance both the supply and demand side of the economy.

8. Liquidity of the financial system need at least to treble to have a smooth flow of credits required for new and existing enterprises.

9. Free convertibility of currency is essential to protect this region from international shocks.

10. A high 8 percent growth strategy is consistent with all above and requires firm commitment, efficient and strong public administration. Gini coefficient should not be above 35 percent for social integrity and cohesion.

2 2. History on growth in South Asia

Systematic thinking about the process of economic growth in the South Asian economies started with the implementations of periodic plans in 1950s (Srinivasan (1964), Myrdal (1982), Sen (1983)). Improvement in the national accounting and input output analysis in 1950s made it possible to focus on analysis of economic growth rates (Krishnamurty (1966), Swamy (1973)). These plans contained discussions about the strategies and programmes of the government for the development of agriculture, construction of road and telecommunication networks, industrialisation, literacy and numeracy, further education and health in process of creating human capital. Adoption of an appropriate technology of production, alleviation of poverty and regional and social balance were other elements. While government intervention in the economy increased under the ISI strategy, these planning exercises also contained programmes for decentralisation (Bardhan (2002)). Whether to follow the labour intensive technology under the Ghandhian or Nehruvian theory of growth or capital intensive technology using the capitalist market economy were debated academically (Srinivasan (1962), Sen (1968), Mahalanobis (1958)). There were strategic debates on whether a nation should push for big heavy industries first letting the trickle down effects to take care of poverty of masses a its consequence. It has become very important to implement the social choice and endowment theories of Sen (1999) to enhance the welfare of the people in the South Asia under the process of rapid globalization

Social and economic institutions are still not appropriate in South Asia for growth. China had created these between 1950s to 1980s, particularly during period of cultural revolutions (Basu (2007)). Challenges remained not only in transforming surplus labour from the rural agricultural sectors to industrial sectors in the dualistic economic set up but also disciplining them for the hard work in the industrial sectors (Lewis (1952), Myrdal (1972) Basu (2009)). Macro, multisectoral and general equilibrium models were constructed for analysis (Parikh and Panda (1995), Fan (2002)). Governments actively intervened in the economy developing various state owned enterprises and increasing the role of state in every aspects of the economy. This resulted in massive build up of bureaucracy, red tapism and corruption in public life. This brought distortions in the efficient allocations of resources. Plans and programmes remained in the self of the planning commission and could not get implemented resulting in dismal economic growth rates that barely averaged around 3 percent during 1950 to 1980s (Ahluwalia (2002)). Growth could not occur in South Asia at a desirable space while other countries including the South Korea, Taiwan, Hong Kong and Singapore transformed themselves from developing to advanced economies during this period adopting good set of export oriented public private partnership approach to economic growth.

What were the golden keys for growth in China and India in recent years? Kotwal,

Ramaswamy and Wadha (2011) attribute India's growth mainly to the export oriented strategies of high tech sector. Xu (2011) attributes the magic of growth in China to its disciplined workers and a regionally decentralised authoritarian system in which "The central government has control over personnel, whereas sub-national governments run the bulk of the economy; and they initiate, negotiate, implement, divert, and resist reforms, policies, rules, and laws". There are very few studies focusing on the aggregate growth in the South Asia in other countries (Srinivasan (2005)). Rajan (2008) and Diamond and Rajan (2009) identified institutional reforms for an efficient financial sector required for economic growth.

Economic integration of the South Asian region must base on the strength of its members. India is stable, dynamic and economic power of the region. Bhutan and Maldives two tiny countries of the region, with less than a million population, are doing better economically by pursuing strategies appropriate to the vastly growing production sectors and middle classes in India. Bhutan is benefiting by proximity to India; by developing a number of hydro power stations generating electricity to sell to India. Maldives is developing fast by tourism aiming at individuals in the growing middle income class in India. Bangladesh is achieving higher growth rates than before by exporting textiles but still caught in natural disasters and political problems. War torn Afghanistan and Pakistan could not emerge above the ethnic conflicts to focus on economic growth. Despite uprooting the age old monarchy and being able to restore the peace with Maoists it is an irony that Nepal is yet struggling to form a political consensus to implement a new constitution for the republic of Nepal. Given above potentials and absurdities a systematic study, particularly focusing on the role that India can play in development of the South Asia region has become an interesting topic of research, apparently very little is found on this in the existing literature.

2.1   SAARC in the Global Growth Competition

The process of convergence and divergence has been going on in the global economy in the last three hundred years after the scientific discoveries and technical innovations that have fundamentally changed the nature of production, exchange and consumption. Industrialisation passed through various episodes of its development from 18th century to the last quarter of 20th century. This process has been spreading to Asian economies in the last six decades. While the countries in the West were successful in achieving higher growth till 1980s, the growth pole has now gradually shifted towards the countries in developing Asia including India in the South Asia; every country in the world wants to achieve a higher rate of growth of GDP per capita.

The average growth rate in developing Asia has been 7 to 8 percent in the last 30 years, twice the global average and three times or more of that in the EU economies (Tables 1

and 2)[1]. After decades of sluggishness[2], growth rates in South Asian countries have been higher than those in other regions of the world; particularly very impressive in India (5.5 to 7.0 percents) and china (8.5 to 10.3 percents). Bosworth and Collins (2008) provide growth accounting at aggregate and sectoral levels of the extraordinarily growth occurring in China and India, residence of over one third of the global population; less than 20 percent population reside now in advanced countries.

Table 1: Thirty Five Years of Growth Experience of SAARC Countries (Million PPP dollars)

	AFG	BTN	BGL	IND	LKA	MLD	NPL	PAK
1980	6,718	719	98,888	812,394	32,021	462	10,931	155,804
2014	37,150	5,235	459,318	6,976,560	221,235	6,042	72,626	887,777
g_y (1980 to 2014)	4.9%	5.7%	4.4%	6.1%	5.5%	7.3%	5.4%	4.9%
Y_{2014}/Y_{1980}	5.5	7.3	4.6	8.6	6.9	13.1	6.6	5.7
g_{pop}	1.8%	1.6%	1.3%	1.2%	0.9%	3.7%	1.4%	1.9%

Table 2: Thirty Five Years of Growth Experience in Emerging and Adanced Coutries (Billion Dollars)

	Australia	Brazil	China	Japan	Germany	South Africa	UK	USA
1980	388.5	1,321.4	1,455.7	2,353.6	2,001.0	306.2	1,089.1	6,656.8
2014	1,123.1	3,112.3	17,150.5	4,596.3	3,553.9	655.9	2,350.4	16,490.1
g_y	3.0%	2.4%	7.0%	1.9%	1.6%	2.2%	2.2%	2.6%
Y_{2014}/Y_{1980}	2.9	2.4	11.8	2.0	1.8	2.1	2.2	2.5
g_{pop}	1.3%	0.9%	0.5%	-0.1%	0.5%	1.6%	0.8%	0.8%

Size of the SAARC region has increased to around 7 percent of global GDP in PPP which has more than doubled since 1980. However this growth in global share pales when compared to China which raised its global share to 16.5 in 2014 percent compared to 6 percent of India. Srinivasan (2005) reports on TFP growth rates underlying these trends.

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[1]Data series used in this paper are obtained from the World Economic Outlook and International Financial Statistics of the IMF, Asian Development Bank and the World Bank accessed through the data archive in the UK (UKdata.stat).

[2]Frustrated from the dismal growth performance from 1950-1980s Malenbaum (1982) even stated pessimistically that "decades of slow growth lie ahead before either nation emerges as a modern industrial state of developed-nation status". Fortunately there occurred a structural break in the growth process around mid 1980s in India motivating Rodrik and Subramanian (2005) to assess policy and structural factors that caused a surge from "Hindu growth" to productivity surge. These surges occurred because of the reforms of the labour market giving freedom in hiring and firing of workers to firms, end of reservation in small scale industries, reforms of the banking sector, simplification of FDI rules, improvement in infrastructure and reduction of debt. These policy factors accelerated growth in India starting in early 1990s (Kaur (2007)).

Economists generally agree on the factors that lead to economic growth as above based on experience of Western Europe, North America, Japan and other advanced economies. Policies that raise the rate of accumulation of physical and human capital and advancement in the production technology lead to higher economic growth (Madison (1995)). Classical, neoclassical and endogenous growth models have been constructed to show the precise relationships among these factors and economic growth. Early versions of South Asian growth models used by the Planning Commission of these nations were based on basic Harrod-Domar set up where given the capital output ratio increasing growth required just increasing the rate of national saving. Then there were various sectoral decomposition exercises aimed to fit the aggregate target. Big gaps remained between targets and accomplishments. Levels of per capita income were similar across all SAARC countries till 1980 but these started to differ substantially following the economic reforms and liberalisations that started in India in late 1980s (after the success of similar policies in China). Kotwal, Ramaswami and Wadhwa (2011) explain how the recent growth in India was spurred by exports of high tech services rather than manufacturing products as in China.

2.2 Size of the market

Big size of the markets are the factors driving the momentum of growth in the South Asia. A large size of population, 1.3 billion in India, not only generates the huge amount of demand for consumption but also provides factors of production required to produce goods and services. Being the home of nearly two billion people comprising about 20 percent of the global population living in the Southern Himalayan belt the South Asia has full potential for becoming the most dynamic region of the world. Its share in the global economy can increase at least up to the 20 percent from 7 percent existing today. Level of GDP in current dollars were 1.8 thousands in India in contrast to 9.8 thousands in China. China's 16 trillion dollar economy (in PPP) is about three times of 5.8 trillion dollars of India. China's per capita in PPP is 2.5 times bigger than that of India (10.7 thousands in comparison to 4.2 thousands).

South Asia has made significant improvements in reducing the population living the poverty line in the last decade. After the initiation of the millennium development goals (MDG), percent of population living below the poverty-line had reduced substantially from 38.2 percent to 24.5 percent in India. Incidence of poverty was higher in Bangladesh 30.3 percent but lower in Nepal (19.1%), Pakistan,(18.0%), Sri Lanka (5.4%) and a lot lower in Bhutan (2.6%) and Maldives (2.5%). This success has made it possible to make the "sustainable growth" as the only major policy objective now as the redistribution issue will take care of itself if new generation of workers comes with skills and productivity required for dynamics of growth across sectors of the economy.

2.3 Capital accumulation

Capital accumulation is the key for economic growth. It includes construction of highways, schools and universities, information networks for speedy communication, generation and

Table 3: Consumption, GDP, Labour Force and Population in South Asia

	Consumption	GDP	Labour Force	Population
Bangladesh	0.06	0.06	0.12	0.10
India	0.79	0.81	0.74	0.75
Nepal	0.01	0.02	0.02	0.02
Pakistan	0.10	0.08	0.10	0.11
Sri Lanka	0.03	0.03	0.01	0.01
Others	0.01	0.001	0.01	0.01
Total Share	1.00	1.00	1.00	1.00
Total	1,904,961,181,434	2,666,094,332,135	674,393,119	1,744,161,298
Data source: World Bank Economic Indicators,2015, accessed from the Wolrd Bank Web.
GDP is in constant 2012 PPP Int $; consumption is in current US $. Others ; Afg., Bhutan, Maldives

transmission lines electricities, centres of research and technologies to create public infrastructure. These are essential for flourishing of businesses and industries in the private sector. For India Agrawal et al. (2010) had found that higher income per capita and improved access to banking facilities significantly improves savings. Saving ratio now is around 51 percent in China compared to 31.3 percent in India. All other SAARC countries had saving ratios lower than in India except Nepal. On the supply side savings of households and retained earning from firms generate funds that can be channelled to investment projects. Remittances and net export surpluses also contribute to the national savings up to 25.3 percent of GDP in Nepal compared to 3.7 percent in India.

There has been significant transformation of investment ratios in India (35.1%), Nepal (35.2%), Bangladesh (29.0%) and Bhutan (46.2%) in last thirty years while it has declined a bit in Pakistan (15.9%), Sri Lanka (33.9%) and Maldives (17.7%). Shahbaz, Ahmad and Chaudhary (2009) find FDI, trade and remittance to be important determinant of growth in Pakistan.

Real interest reflects the true cost of capital and is the difference between the nominal interest and inflation. These have been very unstable as low as negative -6.1 percent in Nepal, 3.2 and 4.1 percents in India and China. Such volatility in the real interest rate creates uncertainty and is not good for growth. This results from the lack of coordination between fiscal and monetary policies.

South Asian countries rely on imported petroleum products. Rising cost of energy will be a major constraint in the economic growth of this region. Granger causality tests and VAR analysis shows casual relation between economic growth and demand (Mallick (2009). Whine EU countries are aiming to supply twenty percent of energhy by harnessing renewable sources, it is irony that the development of hydro potentials did not speed up in the past despite a vast potential in the rivers flowing from the Himalayas. Energy intensity in production (as measures by kg of oil equivalent per $1,000 GDP) has been lowered from

514 to 203 in China and from 201.1 to 129.4 in India.

2.4 Labour market

Capital accumulation enhances productivity of labour. It raises their wages and the level of income. This leads to increase in consumption and further demand for investable goods. South Asia had 655 million people in the labour force in 2012, it was more than the entire population in the European Union. About 74 percent of them belonged to India. Levels and growth rates of GDP depend on the labour force, hours of work and productivity of workers. While sum of how many of working age people are actually working or ready to work determine the labour force of a country, the ratio of total of these two to the working age population is the participation rate. Total population multiplied by participation rate, hours of work and output per hours gives GDP of an economy. Increase in the level of education of the work force, reforms in the labour market institutions, change in habits and cultural factors play roles in determining employability and income of workers. The participation rate varies from 48 percent in Afghanistan to 83 percent in Nepal. Krishnamurty (1966) had found inverse relation between income and birth rates which may explain the declining trends in birth rates in these countries. Participation of female in the labour force is low not only in Afghanistan but also in Pakistan, India and Sri Lanka. It is possible to increase the labour force participation rate by increasing the flexibility of work hours, creation of new job opportunities and changing the attitude towards the works. Dualism between organised and unorganised sectors, rural and urban area and the vast amount of under utilised labour are the real problems in South Asia. This is the reason for high gaps in income wages between skilled and unskilled sectors. While there is a shortage of skilled labour, there is mass disguised unemployment among minorities as Kadirgamar (2009) discusses unemployment of people belonging to Tamil ethnicity in Sri Lanka.

2.5 Structural Transformation in Production

Fall in the share of agriculture sector and rise in the industrial and services sectors is the general process of structural tranformation in the process of economic growth. This is happening in general in all economies of South Asia. What is striking in South Asia compared to China is the rise of the service sector share more than the share of the manufacturing sector. Indian economy expanded in recent by exporting IT services (more than 50 %), tourism is the major service sector in Maldives, Nepal and Sri Lanka. Is this a healthy trend of structural transformation? It depends on how much creative employments can service sector generate. Employment in agriculture is still high 65 percent in Nepal to 45 percent in India. Employment in the industrial sectors is still less than 25 percents in these countries.

A structural transformation is not complete unless the share of output and employment in agriculture are not less than 5 percent of total output and employment. This will happen when the private and public sectors expand, new enterprises get started and new technologies are employed in production. The process of structural transformation has just

started but will take decades for these South Asian economies to reach below 5 percent share of agriculture.

3 3. Economic Policies

Good economic policies inspire people to work hard and be innovative. Policies designed scientifically help to achieve micro and macro economic objectives for growth and prosperity. While the industrial, manpower and employment, environmental or research and development policies are designed for micro economic efficiency, fiscal, financial and trade policies impact at macro level. In general each of these policies aim at achieving the most efficient outcome possible within the resource constraints of the economy. Diamond approach that Rao and Seth (2009) applied to Bhutan could be adopted for analysis of fiscal issues in other countries too.

3.1 Fiscal Policy

Governments in modern welfare states need to provide not only the basic public services such as law, order and defence but also create economic and social infrastructure required for growth. Remaining under the guidance of the overall policies of the time, governments in South Asia implement budgets to achieve macroeconomic stability, better distribution of income and higher rates of investment in public and private sectors of the economy (GOI; Jetly: 2014). One part of these expenditure is for current expenditure to meet the administrative costs of those basic services but the another part is for public investments. These are spent in construction of physical infrastructure such as roads, ports, canals, irrigation network, telecommunications and research and development. Then there are spending to provide for health and education and other services. Size of public spending as a ratio GDP increases with the public commitments like this. It was about 28 percent of GDP in India and Bhutan but around 20 percent in Nepal, Pakistan and Sri Lanka and slightly lower in Bangladesh (Table 4).

Table 4: Ratio of public spending to GDP in SAARC Countries

	AFG	BTN	BGL	IND	LKA	MLD	NPL	PAK
2010	26.6	44.7	14.6	27.2	22.8	40.1	18.8	20.2
2014	26.6	28.2	17.5	28.2	19.2	44.7	20.3	19.9
D/Y		39	36	50	79	67	59	79

Governments raise more revenue from the indirect taxes on goods and services and on international trade than the direct taxes on income and wealth in South Asian countries. Ratio of total revenue to the GDP collected in this way is slightly lower than the ratio of public spending in these countries. Taxes raise prices of goods and services and put burden on both producers and consumers in the economy. These burden increase proportionately with the rate of taxes. Higher taxes discourage business and growth of the private sector. Therefore it is neither optimal nor desirable to raise tax ratio beyond a certain limit.

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Governments borrow from the private sector and central banks when revenues are not enough to pay for public spending. Crowding out occurs when government competes for funds from the private sector. Inflation spirals when government borrows from the central banks, which essentially means printing money to pay for the deficit. Larger deficit destabilises the economy as it also causes an accumulation of public debt over time. The debt GDP ratio was 50 percent in India in 2012. Countries which have higher public debt have very limited ability to engage in development activities as most of their revenues end up on serving the public debt. Privatisation of public enterprises may reduce debt but Ghosh and Sen (2012) argue for privatisation and liberalisation simultaneously otherwise it will be infeasible as it reduces wages and welfare of workers.

3.2   Monetary and financial sector policies

Money is required for exchange of goods and services and it is also used for deferred payments. Liquidity of the financial system is essential for flow of credits in the private sector. Good financial system encourages risk averse people to save. It motivates entrepreneurs to invest borrowing from the financial institutions. Large, medium and small scale enterprises flourish and businesses expand when the financial system is more liquid and reliable. Excess liquidity, however, can cause spiraling inflation and negative real interest rate in the economy. India and its neighbors differ quite a lot in the degree of liquidity in the system (Table 5).

Table 5: Ratio of broad money to GDP in SAARC Countries

	AFG	BTN	BGL	IND	LKA	MLD	NPL	PAK
2010	35.2	71.7	67.4	76.2	37.4	58.1	73.2	41.1
2014	31.9	61.2	69.7	75.6	38.6	58.6	77.5	39.9

Efficiency of the financial system means smaller spread between the lending and borrowing rates, from 3 to 8.5 percents among SAARC countries. This raises the cost of capital and harms initiatives for investment.

Ratio of credits to the private to the GDP and market capitalisation ratios show the strength of economy to channel savings to the investment. Developing countries of South Asia are still far away from reaching the optimal ratio of the financial assets to GDP. While China had this ratio 1.34 but India has only 0.51. Further liberalisation of banking sector, strengthening of rules and regulations for contracts can create an environment for trust and creditworthiness of these economies. Despite this India has better market capitalisation rate of listed companies than that of China; 68 percent compared to 45 percents.

3.3   Trade policy

Trade is considered an engine of growth. Asian tigers earlier and South Korea and China in recent years have achieved phenomenal growth rates by pursuing the export oriented trade policies. Reduction in tariffs and liberalisations in trade has significantly raised the rate

of globalisation in the world. Based on Prowes dababase Goldberg et al. (2010) estimate about 31 percent of introduction of new products account for such reduction in tariffs in India. Using the error correction and cointegration method Kaushik, Arbenser and Klein (2008) found relations between economic growth, export growth, export instability and gross fixed capital formation (investment) in India during the period 1971- 2005.

It is possible to transform economies from a developing ones to more advanced ones following trade promotion policies including the free trade area (FTA), South Asian Trade and Partnership Arrangement (SAPTA), Bay of Bengal initiative for Multi Sectoral Technical and Economic Cooperation (BIMSTEC) and power transformation agreement (PTA) and project development agreements (PDA). However clarity is required in process of tariff reforms (Neary 1998). Should they be unilateral, multilateral and customs union of South Asia? Athukorala (2000) suggests simultaneous reforms of exports, imports and support mechanism. Dutta (2007) found workers in high tariff protected sectors received higher wages than sectors not protected by tariff; with liberalisation wage inequality increased as the wages declined in the protected sectors. Mottaleb and Sonobe (2011) found the education level of manufacturers and performance was higher in garment industry in Bangladesh and foreign owned companies did better than endogenous firms.

Table 6: Trade ratios in SAARC Countries

	AFG	BTN	BGL	IND	LKA	MLD	NPL	PAK
1980	55.0	51.3	23.4	15.1	87.0	358.7	30.3	36.6
2014	44.7	87.3	55.3	54.7	59.3	212.6	43.4	32.6

Trade ratio has been growing remarkably in each of the country in South Asia (Table 6). However the deficit in the current account around 4 percent of GDP in India and above 5 percent in Sri Lanka means opening of economies for free trade also need to complemented by net inflows of foreign direct investment to avoid ever growing amount of outstanding international debt or depreciation of domestic currency with respect to reserve currencies. Running current account surplus each year China has accumulated about 2.5 trillion SDRs 13 times more than that of India (Table 7).

Table 7: International reserves (Millions of SDRs) in SAARC Countries

	AFG	BTN	BGL	IND	LKA	MLD	NPL	PAK
1990	0.22	0.06	0.44	1.44	0.30	0.02	0.23	0.28
2013	4.21	0.64	11.42	180.20	4.32	0.25	3.48	3.42

According to findings reported in Bhattarai (2011) India is not only the dominant country of the region but also the mostly diversified economy in terms of trading partners and range of commodities traded; Nepal and Bhutan are landlocked (India-locked) countries-they trade mostly with India; remittance from exports of skilled and unskilled labour plays

a very important role in filling the gap in the balance of payment for this region; among external trading partners EU is more integrated to the South Asia region on both exports and imports than the United States; despite a long shared border very little trade seems to occur between India and Pakistan; manufacturing products usually accounts for about 60 percent of exports and while agricultural products accounts between 10 to 20 percent except for Bhutan; fuels are significant components of imports, roughly half of the manufacturing imports tariff rates are around 15 percent for both agricultural and non-agricultural goods.

Countries engage also in investment abroad for various reasons. Getting the control of raw materials and resources or to extend the markets for its products. It might be easier to operate in subsidiary operation or partnership when investment occurs across the boarders. India invests less about 0.5 percent of its GDP abroad, China was three times bigger in 2012. It was possible because China had above $559 dollar in the current surplus.

One consequence of rising trade deficit is on the depreciation of the values of its own currency with respect to reserve currencies of the world. Indian currency has depreciated by 9 times against the SDR(from 10.1 Rs to 95.3 Rs per SDR) and 8 times against the US dollars (from 7.5 Rs to 58.6 Rs per SDR) in the last 33 years. This makes foreign good more expensive to its citizens and some deterioration in the standard of livings in international comparison. Rate of depreciation of currencies were much higher in all other countries of South Asia than in India except Maldives.

Global economy is becoming very competitive. Under international product cycle hypothesis production of standard commodities are transferred to emerging countries. China and India have now potential of becoming the workshop for the world for such product under the current set of the WTO regulations. Increase in export earning in this way could be employed to expand production in various sectors of the economy thus creating more jobs for the young and talented individuals.

3.4 Education and technology

Producing quality products for the national and international markets requires skilled labour force. South Asian economies can achieve such skills by educating its children and young individuals properly. Good teachers are required to provide quality education. About 40 percent of adult population is still illiterate in South Asia now. These countries need to invest in adult and school education to raise their literacy rates. It is also important to insure the quality of the literacy so that any literate person can follow instructions required in their employment to produce goods and services (Lohani et al. (2010)). This requires raising education expenditure to GDP ratios.

Share of the exports of high tech goods in manufacturing have increased in both China and India in the last 25 years; to 26.3 percent in China and 6.6 percent in India. These can increase further with the sound education in the primary and secondary schools. It is difficult to achieve such standards when student teacher ratios (STR) are high; compare STR of 40 of India and Pakistan to 18 of China. China had 5.8 million primary teachers

Table 8: International reserves (Millions of SDRs) in SAARC Countries

	AFG	BTN	BGL	IND	LKA	MLD	NPL	PAK
1990	-	52.8	29.2	40.8	86.8	92.2	20.6	25.7
2013	38.2	59.5	57.7	62,8	91.2	98.4	57.4	55.5

compared to 2.8 in India. Bloom and Williamson (1998) explain income as the main factor in reducing birth and death rates and demographic transition in India.

Good communication is essential for right ways of processing the information. Rapid expansions in the cell phones in the last 15 years have increased the awareness of people in South Asia (Table 10). Cost of consumption and productions are significantly reduced because of these easy means of communication.

Table 9: Mobile cellular subscriptions (per 100 people) in SAARC Countries

	AFG	BTN	BGL	IND	LKA	MLD	NPL	PAK
2000	0.00	0.00	0.21	-0.34	2.28	2.80	0.02	0.21
2012	60.35	75.61	62.82	69.92	91.63	165.63	59.62	67.06

3.5 Poverty and inequality

High quality of living is the overall objective of the development process. Long life, good income and better education are dimensions of these qualities. Life expectancy has increased significantly in all South Asian countries from 50s in 1980 to mid 70s in 2012 (Table 11). It is also indicated by the growth rate in consumption as well as the proportions of people living in urban areas relative to those in rural areas. Poverty reduction strategies have succeeded to some extent in reducing poverty (Panda and Ganesh-Kumar (2007), (Banerjee and Duflo (2007). Datta and Ravallion (2011) however suggests that poverty reduction strategies have reduced poverty but raised inequality.

Table 10: Life expectancy at birth in SAARC Countries

	AFG	BTN	BGL	IND	LKA	MLD	NPL	PAK
1980	41.23	44.96	54.87	55.38	68.31	52.27	47.65	58.07
2012	60.51	67.89	70.29	66.21	74.07	77.57	67.98	66.44

Urban areas benefit from agglomeration economies; there are positive as well as negative externalities in cities. There are not only good means of transport and communications, good schools and better hospitals but also better recreational activities. It is easier to access public services there compared to those in rural areas. More than 90 percent of population lives in urban areas in advanced countries. Therefore new cities need to be developed in South Asia for additional 60 percent of its population if the South Asia has

Table 11: Percent of urban population in SAARC Countries

	AFG	BTN	BGL	IND	LKA	MLD	NPL	PAK
1980	15.7	10.1	14.9	23.1	18.8	22.3	6.1	28.1
2012	23.9	36.3	28.9	31.7	12.2	42.2	17.3	36.5

to achieve the growth objectives (Table 12). However, unplanned development also causes an increase in petty crimes including pick-pocketing and stealing; unacceptable ways of redistribution.

Ever since Kuznet (1995) propounded inverse U-shape hypothesis of income distribution there have been many studies to test this in real economies. Inequality starts rising as economies grow and is indicated by gini- coefficients. In South Asia such inequality has been rising slightly in the last two decades but can become alarming as indicated in case of China as these economies grow (Table 13). While there is some trade-off between equity and efficiency tolerance to the greater inequality is harmful for economic growth in the long run. Traditionally land redistribution has been found to be associated with decentralisation and reducing poverty in India (Bardhan (2008) and Besley and Burgess (2000)) and emergence of the middle class society (Banerjee and Duflo (2008)). Recent efforts by the Modi government to eliminate "financial untouchability" by increasing access to financial assets to marginal income groups seems to be a better means of redistributing wealth.

Table 12: Gini Coefficient in SAARC Countries

	AFG	BTN	BGL	IND	LKA	MLD	NPL	PAK
2010	27.8	46.8	27.2	31.5	32.5	62.7	30.1	33.3
2014	27.8	38.4	32.1	33.9	38.3	37.4	32.8	30.0

Given above stylized facts on the major indicators and policy choices what are the models that could be used to analyse issues of sustainable growth and development properly. This issue is taken up in the next section.

4 4. Models of Growth and Development of India and South Asian Countries

Growth models show how the output per capita increases over time with accumulation of physical and human capital and improvement in technology (Solow (1956), Lucas (1988), Romer (1990)). Growth rates differ significantly by countries and the degree of convergence toward the steady state per capita income varies substantially across nations. Some important growth models are applied to SAARC countries simultaneously in order to study the process of growth and development in these countries. I have found no study comparing growth scenarios for all eight SAARC countries in the literature.

4.0.1 Neoclassical multi-country economic growth model for SAARC countries

There are eight countries in the South Asia region indexed by $i = 1, ..8$. Each follows the neoclassical model of economic growth in which output for country i in year t $(Y_{i,t})$ is produced using capital $(K_{i,t})$, labour $(L_{i,t})$ and technology $(A_{i,t})$ with productivity parameters α_i and β_i and a constant returns to scale production function $\alpha_i + \beta_i = 1$ as:

$$Y_{i,t} = A_{i,t} K_{i,t}^{\alpha} L_{i,t}^{\beta} \tag{1}$$

Saving $(S_{i,t})$ is a fixed fraction (s_i) of output and given by

$$S_{i,t} = s_i Y_{i,t} \tag{2}$$

The required level of investment for year t $(I_{i,t})$,depends on the population growth rate (n_i), depreciation (δ_i) and the capital stock as:

$$I_{i,t} = (n_i + \delta_i + a_i) K_{i,t} \tag{3}$$

Capital accumulation relates to investment and the rate of depreciation as:

$$K_{i,t} = (1 - \delta_i) K_{i,t-1} + I_{i,t-1} \tag{4}$$

The market clears in the sense that output $(Y_{i,t})$ is either consumed $(C_{i,t})$ or saved $(S_{i,t})$. The model is closed by balance between saving and investment as:

$$Y_{i,t} = C_{i,t} + S_{i,t} = C_{i,t} + I_{i,t}; \implies I_{i,t} = S_{i,t} \tag{5}$$

Fundamental equation of economics growth
Per capita output per effective worker $(\widetilde{y}_{i,t})$:

$$\widetilde{y}_{i,t} = \frac{Y_{i,t}}{A_{i,t} L_{i,t}} = \frac{A_{i,t} K_t^{\alpha} L_{i,t}^{\beta}}{A_{i,t} L_{i,t}} = \frac{K_{i,t}^{\alpha}}{L_{i,t}^{1-\beta}} = \left(\frac{K_{i,t}}{L_{i,t}} \right)^{\alpha} = k_{i,t}^{\alpha} \tag{6}$$

where $\frac{K_i}{L_i}$ is per capita capital, $k_i = \frac{K_i}{L_i}$.Fundamental equation of economic growth:

$$\Delta k_{i,t} = s\widetilde{y}_{i,t} - ((n_i + \delta_i + \gamma_i)) k_{i,t} \tag{7}$$

where $dk_i/dt = \Delta k_i$.There is no change in per capita capital in the steady state:

$$\frac{dk_i/dt}{k_{i,t}} = \frac{\Delta k_{i,t}}{k_{i,t}} = 0 \tag{8}$$

$\frac{dk_i/dt}{k_{i,t}} > 0$ before the steady state and $\frac{dk_i/dt}{k_{i,t}} < 0$ after the steady state.
Capital in the steady state

Growth with technical progress
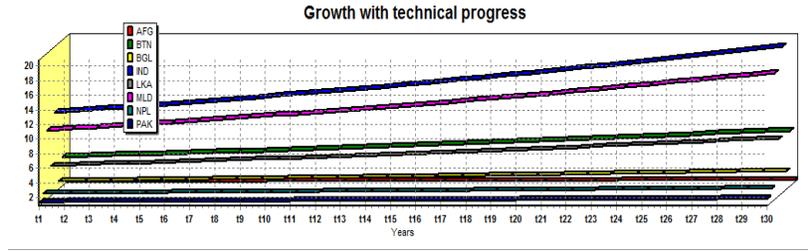
$$\Delta k_{i,t} = s_i y_{i,t} - (n_i + \delta_i + \gamma_i) k_{i,t} \tag{9}$$

$$\frac{\Delta k_i}{k_{i,t}} = s_i A_i k_{i,t}^{\alpha-1} - (n_i + \delta_i + \gamma_i) = 0 \tag{10}$$

$$s_i A_i k_i^{\alpha} = (n_i + \delta_i + \gamma_i) k_i \tag{11}$$

Per capita capital in the steady state

$$k_i = \left(\frac{s_i A_i}{(n_i + \delta_i + \gamma_i)} \right)^{\frac{1}{1-\alpha_i}} \tag{12}$$

Output per worker and per effective workers in the steady state

$$\widetilde{y}_i = \left(\frac{s_i A_i}{(n_i + \delta_i + \gamma_i)} \right)^{\frac{\alpha_i}{1-\alpha_i}} \tag{13}$$

Output per effective workers in the steady state

$$\widetilde{y}_i = \left(\frac{s_i A_i}{(n_i + \delta_i + \gamma_i)} \right)^{\frac{\alpha_i}{1-\alpha_i}} \tag{14}$$

Output per capita in the steady state

$$y_i = A_i \left(\frac{s_i A_i}{(n_i + \delta_i + \gamma_i)} \right)^{\frac{\alpha_i}{1-\alpha_i}} \tag{15}$$

Percapita consumption in the steady state

$$c_i = (1 - s_i) \cdot y_i = (1 - s_i) A_i \left(\frac{s_i A_i}{(n_i + \delta_i + \gamma_i)} \right)^{\frac{\alpha_i}{1-\alpha_i}} \tag{16}$$

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Table 13: Parameters of the noeclassical growth model for SAARC Countries

Countries	A	γ	s	α	δ	n	Pop
AFG	1.0	0.01	0.18	0.35	0.05	1.8	28.60
BTN	1.5	0.02	0.35	0.40	0.05	1.6	0.757
BGL	1.2	0.02	0.30	0.35	0.05	1.3	157.90
IND	2.0	0.02	0.39	0.40	0.03	1.2	1,283.00
LKA	2.0	0.02	0.30	0.30	0.02	0.9	21.00
MLD	2.0	0.02	0.20	0.50	0.06	3.7	0.470
NPL	1.0	0.01	0.30	0.40	0.05	1.4	28.00
PAK	1.1	0.01	0.25	0.35	0.06	1.9	191.70

4.1 Simulated growth paths under the neo-classical growth model

4.1.1 Growth model with human capital for SAARC countries

A simplified version of Lucas (1988) growth model shows how division of time between learning and earning (working) is very important for economic growth. When people learn more they create more human capital h and higher h means more output:

$$Y_i = K_i^\alpha \left(\theta_i h_i L_i\right)^{1-\alpha_i} \tag{17}$$

h_i = human capital per worker.
θ_i = fraction of time spent on working.
$1 - \theta_i$ = fraction of time spent on studies.
L_i = labour supply –(assume this as given).
Growth model with human capital for SAARC countries
Stock of human capital starting with the initial stock of human capital $h_{i,0}$:

$$h_{i,t} = h_{i,0} e^{\phi_i (1-\theta_i) t} \tag{18}$$

Growth rate of human capital $(g_{h,i})$ depends on fraction of time spent on studies $(1 - \theta_i)$ and the rate of human capital created by per unit of time spent on studying ϕ_i.

$$g_{h,i} = \phi_i \left(1 - \theta_i\right) \tag{19}$$

Growth model with human capital for SAARC countries: parameters
Growth model with human capital for SAARC countries:per capita GDP
Growth model with human capital for SAARC countries:per capita human capital
In an endogenous growth model with simplified linear technology

$$Y_{i,t} = A_{i,t} K_{i,t} \tag{20}$$

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Table 14: Parameters of the endogenous growth model for SAARC Countries

Countries	A	γ	s	α	θ	δ	n	Pop
AFG	1.0	0.01	0.18	0.35	0.35	0.05	1.8	28.60
BTN	1.5	0.02	0.35	0.40	0.40	0.05	1.6	0.757
BGL	1.2	0.02	0.30	0.35	0.35	0.05	1.3	157.90
IND	2.0	0.02	0.39	0.40	0.40	0.03	1.2	1,283.00
LKA	2.0	0.02	0.30	0.30	0.30	0.02	0.9	21.00
MLD	2.0	0.02	0.20	0.50	0.50	0.06	3.7	0.470
NPL	1.0	0.01	0.30	0.40	0.40	0.05	1.4	28.00
PAK	1.1	0.01	0.25	0.35	0.35	0.06	1.9	191.70

Per capita income in the endogenous model of growth (pp1) in SAARC countries
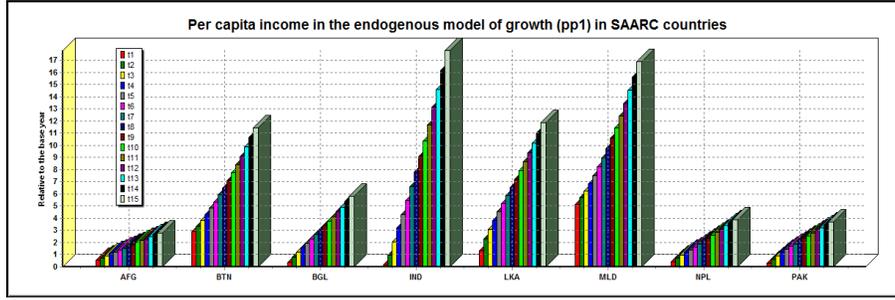
there are only two sources of growth, accumulation of technical knowledge and capital as: $g_{y,i} = g_{A,i} + g_{K,i}$. Here technology ($A$) grows according to the manpower working in the knowledge sector and the existing stock of knowledge ($\phi > 1$) ; $g_{i.A} = \theta_i A^\phi L_{i,A}^\lambda$. India with huge and skilled population has great advantage in growth process as shown in the simulation

4.1.2 Ramsey Growth Model for South Asia

A central planner maximises life time utility of a representative household

$$\max_{C_{i,t}} U_{i,o} = \sum_{t=0}^{\infty} \beta_i^t \ln (C_{i,t}) \tag{21}$$

Subject to Technology $(0 < \alpha_i < 1; \ 0 < \beta_i < 1; A_{i,t} > 0)$

$$Y_{i,t} = A_{i,t} K_{i,t}^{\alpha_i} \tag{22}$$

Capital Accumulation

$$K_{i,t} = (1 - \delta_i) K_{i,t-1} + I_{i,t} \tag{23}$$

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Growth of human capital (hh) in SAARC countries

Growth of GDP with endogenous technology in SAARC coutries (Simmulations)
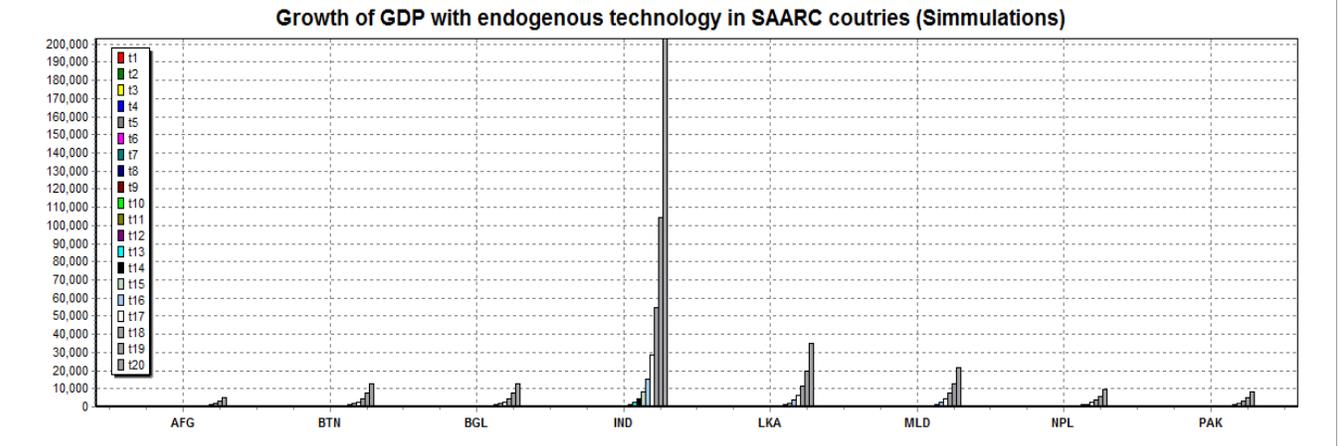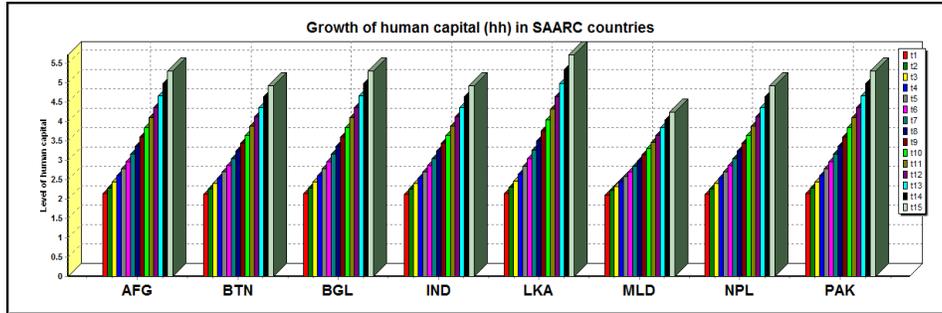
Market Clearing

$$Y_{i,t} = C_{i,t} + S_{i,t} \qquad I_{i,t} = S_{i,t} \tag{24}$$

Initial (boundary) condition

$$K_{i,o} = K_{i,o} \tag{25}$$

Determinants of steady state in the Ramsey growth model

- Subjective discount factor (β_i): preferences of households for current consumption relative to future consumption

- Productivity of capital (α_i)

- Rate of depreciation of capital (δ_i)

- Technology of production, (A_i)

- See analytical solution and numerical examples

Solution of the Ramsey Model
First find the reduced form (derive an expression of consumption using all model equations (22) and (23) into (24) above)

$$C_{i,t} = Y_{i,t} - S_{i,t} = A_{i,t} K_{i,t}^{\alpha_i} - I_{i,t} = A_{i,t} K_{i,t}^{\alpha_i} - \{K_{i,t} - (1 - \delta_i) K_{i,t-1}\} \tag{26}$$

Plug the derived value of consumption in the utility function (21) as:

$$U_{i,t} = \ln(C_{i,t}) = \ln\left[A_{i,t} K_{i,t}^{\alpha_i} - \{K_{i,t} - (1 - \delta_i) K_{i,t-1}\}\right] \tag{27}$$

Then get the present value of lifetime utility using the subjective discount rate β_i^t

$$\max_{K_{i,t}} U_o = \sum_{t=0}^{\infty} \beta_i^t \ln\left[A_i K_{i,t}^{\alpha_i} - \{K_{i,t} - (1 - \delta_i) K_{i,t-1}\}\right] \tag{28}$$

Social planner chooses consumption path (and saving) to maximise U_o.

Consumption ($C_{i,t}$) is a control variable and capital is a state ($K_{i,t}$) variable. That means capital accumulation is a result of consumption choices.

Solution of the Ramsey Model

Optimal conditions for infinite horizon in (28) should also be optimal for any two periods

$$U_o = ... + \beta_i^t \ln\left[A_i K_{i,t}^{\alpha_i} - \{K_{i,t+1} - (1 - \delta_i) K_{i,t}\}\right]$$
$$+ \beta_i^{t+1} \ln\left[A_i K_{i,t+1}^{\alpha_i} - \{K_{i,t+2} - (1 - \delta_i) K_{i,t+1}\}\right] + .. \tag{29}$$

This generate Euler equations

$$\frac{\partial U_o}{\partial K_{i,t+1}} = -\frac{\beta_i^t}{C_{i,t}} + \frac{\beta_i^{t+1}}{C_{i,t}}\left[\alpha A_i K_{i,t+1}^{\alpha_i-1} + (1-\delta_i)\right] = 0. \tag{30}$$

$$\frac{C_{i,t}}{C_{i,t}} = \frac{\beta_i^{t+1}}{\beta_i^t}\left[\alpha A_i K_{i,t+1}^{\alpha_i-1} + (1-\delta_i)\right] \tag{31}$$

In steady state $C_{i,t} = C_{i,t} = \overline{C}_i$; $K_{i,t} = K_{i,t} = \overline{K}_i$

$$1 = \beta_i\left[\alpha_i A_i \overline{K}_i^{\alpha_i-1} + (1-\delta_i)\right] \tag{32}$$

Steady State Capital Stock in Ramsey Model:

$$\overline{K}_i^{\alpha_i-1} = \frac{1}{\alpha_i A_i}\left[\frac{1}{\beta_i} - (1-\delta_i)\right] = \left[\frac{1-\beta_i(1-\delta_i)}{\alpha_i A_i \beta_i}\right] \tag{33}$$

$$\overline{K}_i = \left\{\frac{1-\beta_i(1-\delta_i)}{\alpha_i A_i \beta_i}\right\}^{\frac{1}{\alpha_i-1}} \tag{34}$$

Steady State Output in Ramsey Model:

$$\overline{Y}_i = A_i\left\{\frac{1-\beta_i(1-\delta_i)}{\alpha_i A_i \beta_i}\right\}^{\frac{\alpha_i}{\alpha_i-1}} \tag{35}$$

Steady state investment

$$\overline{I}_i = \overline{K}_i - (1-\delta_i)\overline{K}_i = \delta_i\overline{K}_i = \delta_i\left\{\frac{1-\beta_i(1-\delta_i)}{\alpha_i A_i \beta_i}\right\}^{\frac{1}{\alpha_i-1}} \tag{36}$$

$$\overline{C}_i = \overline{Y}_i - \overline{I}_i = A_i\left\{\frac{1-\beta_i(1-\delta_i)}{\alpha_i A_i \beta_i}\right\}^{\frac{\alpha_i}{\alpha_i-1}} - \delta_i\left\{\frac{1-\beta_i(1-\delta_i)}{\alpha_i A_i \beta_i}\right\}^{\frac{1}{\alpha_i-1}} \tag{37}$$

Discounted life time utility of a representative household
Substituting (37) into (28) gives the lifetime utility in the steady state:

$$U_o = \sum_{t=0}^{\infty}\beta_i^t \ln\left[A_i\left\{\frac{1-\beta_i(1-\delta_i)}{\alpha_i A_i \beta_i}\right\}^{\frac{\alpha_i}{\alpha_i-1}} - \delta_i\left\{\frac{1-\beta_i(1-\delta_i)}{\alpha_i A_i \beta_i}\right\}^{\frac{1}{\alpha_i-1}}\right] \tag{38}$$

In the dynamic stochastic general equilibrium (DSGE) model A_i is stochastic:

$$\ln(A_{i,t}) = \rho_i \ln(A_{i,t}) + \varepsilon_{i,t} \tag{39}$$

$A_{i,t}$ the current level of technology autocorrelated to the past with $\rho_i < 1$ and error term $\varepsilon_{i,t}$ is random term, $\varepsilon_{i,t} \sim N(0,\sigma^2)$.

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GDP (yy) in SAARC economies in Ramsey model

Percapita income (pp) in Ramsey model in SAARC economies
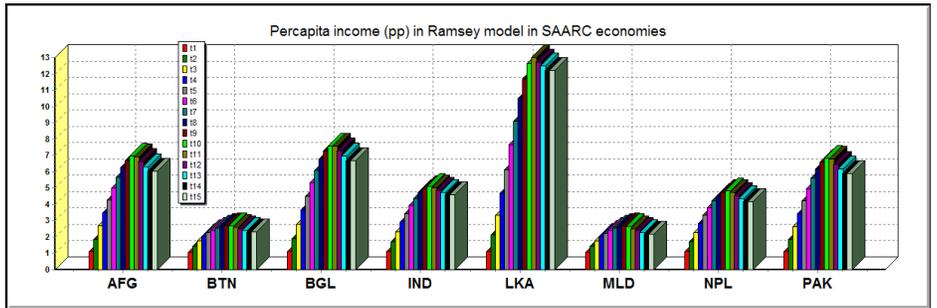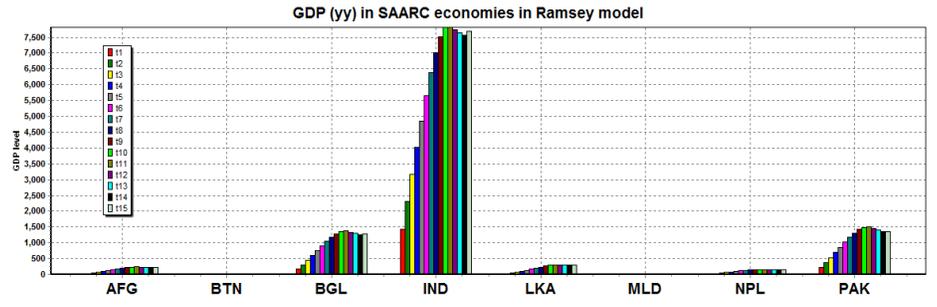
5   5. Empirical analysis: pairwise correlations and panel regressions

Time series on economic growth rates are available from the international comparison project such as the Summers-Heston Penn world tables, Asian Development Bank and World Development indicators of the World Bank. Correlations and panel data regression estimates are mostly in support of the theoretical simulations presented above.

Table 15: Pairwise correlation in growth rates in SAARC countries, 1980-2014

	gr_IND	gr_NPL	gr_LKA	gr_BGL	gr_PAK	gr_MLD	gr_BTN
gr_IND	1.0000						
gr_NPL	0.0516	1.0000					
gr_LKA	0.2917	0.4385	1.0000				
gr_BGL	0.4001	0.4109	0.4749	1.0000			
gr_PAK	0.3725	0.0593	0.3236	0.4513	1.0000		
gr_MLD	0.0281	-0.1574	0.0210	0.0991	0.0980	1.0000	
gr_BTN	-0.0004	-0.1949	-0.0109	-0.126	0.0291	-0.1711	1.0000

Consider a dynamic panel data model of the form where growth rate of output of country i at time t, $y_{i,t}$ is explained by its lagged values and a set of exogenous explanatory

variables $x_{i,t}$. Here α_i is individual specific effects and λ_t represents the time specific effects.

$$y_{i,t} = \gamma y_{i,t-1} + \alpha_i + \beta_i x_{i,t} + \lambda_t + e_{i,t} \qquad \gamma < 1 \tag{40}$$

A generalised method of moments (GMM) as proposed by Hansen (1982) for a panel data model generates the unbiased estimate of γ and α_i solving endogeneity and bias in estimation due to the presence of correlation between the lagged values of dependent variables $y_{i,t-1}$ and errors terms $e_{i,t}$. Right instrument for lagged $y_{i,t-1}$ say by $y_{i,t-2}$ solves this inconsistency and generates unbiased estimator (ignoring $x_{i,t}$ and λ_t):

$$\widehat{\gamma}_{IV} = \frac{\sum\limits_{t}^{T}\sum\limits_{i}^{N} y_{i,t-2}\left(y_{i,t-1} - \overline{y}_{i,t-2}\right)}{\sum\limits_{t}^{T}\sum\limits_{i}^{N} y_{i,t-2}\left(y_{i,t-1} - y_{i,t-2}\right)} \tag{41}$$

where $y_{i,t-2}$ is used as instrument of $(y_{i,t-1} - y_{i,t-2})$.

GMM method includes the most efficient instrument, Z_i:

$$\gamma_{GMM} = \left(\left(\sum_{i=1}^{N}\Delta y_{i,t} Z_i\right) W_N \left(\sum_{i=1}^{N} Z_i' \Delta y_{i,t}\right)\right)^{-1} \times$$
$$\left(\left(\sum_{i=1}^{N}\Delta y_{i,t} Z_i\right) W_N \left(\sum_{i=1}^{N} Z_i' \Delta y_{i,t}\right)\right) \tag{42}$$

Arrelano and Bond (1995), Wijndmeir (2000), Blundell and Smith (1989) and Verbeek (2004), Wooldridge (2002) among others have more extensive analysis of the GMM estimation. The essence of the GMM estimation remains in finding a weighting matrix that can guarantee the most efficient estimator. This should be inversely proportional to transformed covariance matrix.

$$W_N^{opt} = \left(\left(\frac{1}{N}\right)\sum_{i=1}^{N} Z_i' \Delta e_{i,t}\Delta e_{i,t}' Z_i\right)^{-1} \tag{43}$$

The GMM estimator with instrument (levels, first differences, orthogonal deviations, deviations from individual means, combination of first differences and levels) used in PcGive is:

$$\widehat{\delta} = \left(\left(\sum_{i=1}^{N} W_i^* Z_i\right) A_N \left(\sum_{i=1}^{N} Z_i' W_i\right)\right)^{-1}\left(\left(\sum_{i=1}^{N} W_i^* Z_i\right) A_N \left(\sum_{i=1}^{N} Z_i' y_i^*\right)\right) \tag{44}$$

where $A_N = \left(\sum\limits_{i=1}^{N} Z_i' H_i Z_i\right)^{-1}$ is the individual specific weighting matrix.

Doornik and Hendry (2001, chap. 7-10) provide a procedure on how to estimate coefficients using fixed effect, random effect and the GMM methods including a lagged terms of dependent variable among explanatory variables for a dynamic panel data model: $y_{i,t} = \sum_{i=1}^{p} a_k y_{i,t-s} + \beta^t(L) x_{i,t} + \lambda_t + \alpha_i + e_{i,t}$ or in short $y_{i,t} = W_i \delta + \iota_i a_i + e_i$. It will be relevant to study process of convergence among states in India and SAARC countries using this type of growth model in coming years (see Brandt, Ma, Rawski (2014) for China).

Table 16: GDP on Capital and Labour in SAARC countries, 1980-2014 (double log)

Dep Variable: ln(Y)	Fixed Effect	Random Effect
lnk	0.614***	0.614***
lnpop	0.332***	0.332***
ltfp	1.000***	0
Constant	0.000	0.000
Tests	$F(3, 235) = (0.000)$	Wald: $\chi^2(2) = 4621\ (0.000)$
Sample	N =7;T=35,NT= 245	N =7; T=35,NT= 245
Within	1.00	0.949
Between	1.00	0.981
Overall	1.00	0.979
Hausman Test for random effect model $\chi^2(2) = 0.09\ (0.957)$		

Panel regressions for SAARC countries: growth accounting

Table 17: Growth accounting in SAARC countries, 1980-2014

Dep Variable: ln(Y)	Fixed Effect	Random Effect
grk	0.614***	0.614***
grpop	0.332***	0.332***
grtfp	1.000***	0
Constant	0.000	0.000
Tests	$F(3, 228) = (0.000)$	Wald: $\chi^2(2) = 4621\ (0.000)$
Sample	N =7;T=34, NT= 245	N =7; T=34, NT= 238
Within	1.00	0.1028
Between	1.00	0.4578
Overall	1.00	0.1074
Hausman Test for random effect model $\chi^2(2) = 31.5\ (0.000)$		

Panel regressions for SAARC countries: with human capital

Estimated coefficients of the dynamic panel data model of growth for the South Asian economies confirm to the basic results of the simulation. These show the share of capital to be around 60 percent, that of labour and human capital 25 and 15 percent respectively.

Table 18: GDP on Capital and Labour in SAARC countries, 1980-2014 (double log)

Dep Variable: ln(Y)	Fixed Effect	Random Effect
lnk	0.603***	0.699***
lnpop	0.248***	0.280***
human capital	0.151***	0.133***
Constant	3.080	3.040
Tests	$F(3, 201) = (0.000)$	Wald: $\chi^2(2) = 3849\ (0.000)$
Sample	N =6;T=35,NT= 210	N =6; T=35,NT= 210
Within	0.943	0.943
Between	0.989	0.989
Overall	0.986	0.986
Hausman Test for random effect model $\chi^2(2) = 3.93(0.26)$		

There are also country and time specific factors at play as growth rate vary significantly across countries and over time. While these results are consistent to panel data estimates of growth for other countries as in Barro and Sala-i-Martin, additional factors such as cognitive skill and openness and joint responsibility of public and private sectors to educate children are examined other studies (Basu and Bhattarai (2012a, 2012b).

One sector growth models presented above are analytically tractable but practically they are not designed to answer questions relating to sectoral structure of production, issue of structural transformation and distribution of income as an outcome of the general equilibrium process in the economy. This requires a full dynamic computable general equilibrium (DCGE) model for a decentralised economy[3].

6   6. Macroeconomic-models for SAARC countries

6.1   Dynamic Computable General Equilibrium Model

DCGE models contain the relative price system and intertemporal choices of firms and households as key factors determining the growth of various sectors of the economy and

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[3]Firms produce output employing capital and labour inputs given the production technology to maximise profit. Some of them operate under more competitive markets and others in more monopolistic structure. These private firms are key drivers of economic growth as there are significant spill over effects within and between industries as firms engage in the research and development activities. Demand for their products by households change with the level of their income. Analysis of supply and demand by firms and the industry, pricing, costing and output decisions in response to the policies over time are usually analysed using partial equilibrium models. Elasticities of demand and supply or substitutions among inputs provide information in the structural features of these markets. Multiple regression, cross section and panel data analysis, AR, MA, ARIMA, ARCH GARCH models are applied to estimate parameters of functions derived from the optimisation of objectives of firms and households subject to budget or technology constraints. These partial equilibrium models have been applied to study the volatility of prices and trade in the financial markets and their consequences in the welfare of households (Fama (2014), Shiller (2014)).

distribution of income among households while studying the long run cycles of model economies (Bhattarai (2010)). The main equations for a typical DCGE model are as follows:

1) Demand side: welfare of households $\left(U_0^h\right)$ given by consumption $\left(C_{i,t}^h\right)$ and leisure $\left(L_t^h\right)$:

$$Max \quad U_0^h = \sum_{t=1}^{\infty} \beta_h^t U_t^h; \quad 0 < \beta_h^t < 1 \tag{45}$$

$$U_t^h = U\left(C_{i,t}^h, L_t^h; \sigma_c\right) \tag{46}$$

Subject to budget constraints:

$$I_0^h = \left[\sum_{t=0}^{\infty} e^{-\rho t} \sum_{i=1}^{N}\left\{P_{i,t}\left(1+t_i\right)C_{i,t}^h\right\} + w_t^h\left(1-t_l\right)L_t^h\right] \tag{47}$$

$$= \sum_{t=0}^{\infty} e^{-\rho t} I_t^h = \left[\sum_{t=0}^{\infty} w_t^h\left(1-t_l\right)\overline{L}_t^h + r_t\left(1-t_k\right)K_t^h\right]$$

2) Supply: production, finance and accumulation:

$$Y_{i,t} = F_i\left[K_{i,t}\left(r_{i,t}, w_t^h, p_{i,t}\right), \ p, \ L_i\left(w_t^h, \ p_{i,t}\right), \ A_i, \sigma_c\right] \tag{48}$$

$$\sum_{t=0}^{T} P_{i,t} Y_{i,t} = \sum_{t=0}^{T}\left[r_t\left(1+t_k\right)K_{i,t} + \sum_{h=i}^{H} w_t^h\left(1+t_l\right)L_{i,t}^h\right] \tag{49}$$

Savings $(Y_t - C_t)$ adds to the accumulation of assets (A_t) in the economy:

$$A_t\left(1+\widehat{r}_t\right) + Y_t - C_t = A_{t+1} \tag{50}$$

$$A_t r_t + Y_t - C_t - \left\{A_{t+1} - (1-\delta)A_t\right\} = 0 \tag{51}$$

In equilibrium there is equivalence between financial assets (A_t) and physical capital (K_t) ; replace A_t by K_t:

$$Y_t - C_t - \left(K_{t+1} - (1-\delta)K_t\right) = 0; \quad \Longrightarrow\Longrightarrow Y_t = C_t + I_t \tag{52}$$

This the optimal financial deepening at the sectoral and aggregate levels:

$$F_t = \frac{K_t}{Y_t}; \quad F_{i,t} = \frac{K_{i,t}}{Y_{i,t}}; \quad F_t = \sum_{i=1}^{N} F_{i,t}; \quad K_t = \sum_{i=1}^{N} K_{i,t}; \quad Y_t = \sum_{i=1}^{N} Y_{i,t} \tag{53}$$

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3) Intetemporal balance:

$$\sum_{t=0}^{T}\sum_{i=1}^{N}P_{i,t}\left(1+t_{ci}^{h}\right)C_{i,t}^{h} = \sum_{t=0}^{T}\left[r_{t}\left(1-t_{k}\right)K_{t}^{h}+R_{t}^{h}+w_{t}^{h}\left(1-t_{l}\right)LS_{t}^{h}\right] \qquad (54)$$

$$\sum_{t=0}^{T}P_{i,t}Y_{i,t} = \sum_{t=0}^{T}\left[r_{t}\left(1-t_{k}\right)K_{i,t}+\sum_{h=i}^{H}w_{t}^{h}L_{i,t}^{h}\right] \qquad (55)$$

$$\sum_{t=1}^{T}G_{t} \lessgtr \sum_{t=1}^{T}\left(RV_{t}+\sum_{h=1}^{H}R_{t}^{h}\right) \qquad (56)$$

4) Trade and finance:

$$\sum_{t=0}^{T}\sum_{i=1}^{N}PE_{i,t}E_{i,t} = \sum_{t=0}^{T}\sum_{i=1}^{N}PM_{i,t}M_{i,t} \qquad (57)$$

$$\sum_{i=1}^{N}PE_{i,t}E_{i,t} - \sum_{i=1}^{N}PM_{i,t}M_{i,t} = \pm\ FL_{t} \qquad (58)$$

5) Public sector and financial deepening:

$$\sum_{t=0}^{\infty}e^{-\rho t}RV_{t} \lessgtr \sum_{t=0}^{\infty}e^{-\rho t}\left(G_{t}+R_{t}^{h}\right) \qquad (59)$$

$$RV_{t} = \sum_{h=1}^{H}\sum_{i=1}^{N}P_{i,t}t_{ci}^{h}C_{i,t}^{h} + \sum_{i=1}^{N}\sum_{h=i}^{H}\left(w_{t}^{h}t_{l}L_{i,t}^{h}+r_{t}\left(1+t_{k}\right)K_{i,t}\right)$$

General equilibrium solutions are obtained when all markets clear to a set of equilibrium relative prices consistent to Pareto optimal allocations across all these markets (Balasko and Geanakoplos (2012)).Parameters of these models are calibrated from the information obtained from the input-output tables, tax-transfer system, social accounting matrices and national accounts of these economies.

The general equilibrium is achieved when the excess demand are zero in each market for each period representing balance between demand and supply in each market. Households and producers optimise given their budget constraints. Relative price adjustment mechanisms guarantee the most efficient outcome in these markets. The existence of the general equilibrium is guaranteed by fixed point theorems and solved using the dynamic routines in the GAMS/MPSGE software. Given the properties of demand and supply functions equilibrium is stable and unique and gives the evolution of the model economies from 2006 to 2101(see Bhattarai (2007) and Bhattarai (2011)).

This model has been applied to China, India to study optimal and actual capital deepening ratios (OFDR and AFDR) and the results are summarised in Table 15. These show that the optimal capital intensity in China at 0.81 is much lower than in India's 1.54. This implies India economy being more capital intensive than the Chinese economy in production technology. However the ratio of actual stocks of the financial assets to GDP is much higher in China at 1.88 compared to 0.78 in India. Thus China is over-financed with over financing ratio (OFR) at 2.3 and India is under-financed with the OFR at 0.49. This result implies speedy growth in India requires a rapid growth of its financial sector (see Dougas and Rajan (2008) and Kawai (2011)).

Table 15: Optimal and actual financial deepening ratios and Growth Rates for 2008-12				
Countries	OFDR	AFDR	OFR	GR 2008-12
China	0.81	1.88	2.3	9.30
India	1.54	0.78	0.49	6.50
Note: OFDR and AFDR are optimal and actual financial deepeing ratios; OFR over financing ratio				
Based on Bhattarai (2014); More details available upon request.				

Main focus of this DCGE model is to study the long run growth in output and employment across sectors given endogenous or exogenous changes in the rate of taxes and tariffs. Comparative static features of Parikh, Narayana, Panda and Kumar (1995) could be put in such dynamic frameworks to study the evolution of Indian economy in coming decades. GTAP and GTAPinGAMS models also could be applied for empirical investigation on equilibrium relations among all South Asian economies to test theories of Bhagwati and Srinivasan (2002), Panagaria (2006), Neary (1998) for assessing how these countries benefit from inter and intra regional trade. Various arrangements for creating free trade area (FTA) under the SAPTA or other bilateral agreements can be studied constructing small open economy or multicountry trade models. Opening economies for trade with specialisation based on comparative advantages are essential features of the growth competition. A free trade association (FTA) under the South Asia Free Trade Association (SAFTA) can open such opportunities of cross boarder production and trade. India can sell skill, technology and manufacturing goods to its neighbors; it can buy cheaper hydro electricity from Nepal and Bhutan and agricultural products from Pakistan. Gains from cooperative rather than discriminatory approach with respect to the rest of the world could be used for the development of the region. Given the development of the GTAP/Unido/STAN databases it is possible now to analyse the significance of bilateral and multilateral trade relations among these countries. As opening intra-regional FDI could increase productivities, it is essential to remove limited product coverage, existence of negative lists and restrictive rules of origin that are becoming obstacle in such settings (Taneja and Sawhney (2007)).

6.2 Macroeconomic simulation models of South Asia

With time series on major components of aggregate demand, price levels, interest rate and exchange rates presented above it is possible to construct a macroeconometric model to

forecast macro variables of India and South Asian economies. Essentially these models are helpful in studying trends and forecasts in the short run specially useful for annual projection of macro quantities such as consumption, investment, imports or exports or public spending and prices in the private and public sectors given projections of the public finance or the BOP conditions of the economy.

Table 16: Macroeconomic model of inflation, current account and growth in India and Nepal											
	India						Nepal					
	Inflation		CA balance		Growth		Inflation		CA balance		Growth	
	β	t_prob	β	t_prob	β	t_prob	β	t_prob	β	t_prob	β	t_prob
g_y	0.084	0.223	-0.007	0.985	0.007	0.904	-0.494	0.017	0.017	0.192	-0.111	0.463
a_g	1.417	0.001	-6.275	0.008	-0.138	0.667	0.258	0.049	-0.002	0.812	-0.038	0.693
M2_y	0.455	0.002	-3.337	0.000	-0.002	0.985	0.251	0.030	0.003	0.672	0.032	0.714
const	-0.53	0.005	321.9	0.003	9.626	0.518	-10.44	0.229	-0.164	0.780	5.377	0.441
	R^2=0.66; N =36; F(9,65) = 5.99 [0.0000] **						R^2=0.59; N =36; F(9,65) = 3.29517 [0.0023] **					

Each South Asian economy have some sorts of open economy IS-LM model underlying their policy decisions and assessing the macroeconomic fluctuations. These basically Keynesian demand driven models are popular as they are easier to compute and implement because of recent innovations in econometric techniques (Hendry and Doornik (1994), Bhattarai (2008) and Bhattarai and Mallick (2013)).

Table 17: Macroeconomic model of inflation, current account and growth in Bangladesh and China											
	Bangladesh						China					
	Inflation		CA balance		Growth		Inflation		CA balance		Growth	
	β	t_prob	β	t_prob	β	t_prob	β	t_prob	β	t_prob	β	t_prob
g_y	1.713	0.003	-0.006	0.962	-0.436	0.003	-0.066	0.689	3.058	0.247	0.178	0.031
a_g	0.925	0.003	-0.050	0.568	-0.213	0.021	-1.357	0.057	-13.24	0.232	-0.775	0.026
M2_y	0.133	0.189	0.013	0.595	0.018	0.489	-0.210	0.075	-0.603	0.739	-0.127	0.027
const	-44.46	0.004	0.655	0.858	15.66	0.000	54.49	0.036	339.31	0.349	35.93	0.005
	R^2=0.87; N =36; F(9,65) = 9.93091 [0.0000] **						R^2=0.66; N =36;F(9,65) = 4.07898 [0.0003] **					

Table 18: Macroeconomic model of inflation, current account and growth in Pakistan and Sri Lanka											
	Pakistan						Sri Lanka					
	Inflation		CA balance		Growth		Inflation		CA balance		Growth	
	β	t_prob	β	t_prob	β	t_prob	β	t_prob	β	t_prob	β	t_prob
g_y	0.187	0.055	-0.129	0.145	-0.180	0.000	0.023	0.812	0.007	0.696	0.035	0.409
a_g	0.321	0.368	0.064	0.844	-0.131	0.416	-0.074	0.772	0.058	0.003	-0.131	0.288
M2_y	-0.284	0.178	0.077	0.612	0.238	0.016	-0.582	0.184	0.031	0.094	-0.154	0.422
const	10.184	0.478	-6.446	0.624	0.051	0.969	32.929	0.103	-8.940	0.015	12.560	0.152
	R^2=0.56; N =36; F(9,65) = 2.9261 [0.0057] **						R^2=0.42; N =36; F(9,65) = 1.86883 [0.0726]					

We estimate simultaneous equations models of India, China and SAARC countries to study how inflation, current account balance and growth rates relate to fiscal and mon-

etary policy variables represented by the size of the government (g_y) ad liquidity ratio (M2_y) and structural facture (a_g). Again results presented in tables 16 to 19 below show significance (t_prob) and sign of coefficients (β) on them vary tremendously across these countries. This means markets and policies are very different among these countries.

	Bhutan						Maldives					
	Inflation		CA balance		Growth		Inflation		CA balance		Growth	
	β	t_prob	β	t_prob	β	t_prob	β	t_prob	β	t_prob	β	t_prob
g_y	-0.088	0.157	-0.002	0.324	0.185	0.053	0.116	0.203	-0.004	0.008	-0.164	0.039
a_g	-0.167	0.206	0.007	0.073	-0.270	0.177	-0.996	0.009	0.008	0.146	0.260	0.399
M2_y	-0.157	0.020	0.001	0.452	-0.118	0.233	0.047	0.713	-0.009	0.000	0.009	0.932
const	22.34	0.001	-0.265	0.161	12.81	0.171	6.073	0.169	0.318	0.000	10.385	0.009
	R^2=0.55; N =33; F(9,65) = 2.89281 [0.0061] **						R^2=0.79; N =33; F(9,65) = 6.78843 [0.0000] **					

Table 19: Macroeconomic model of inflation, current account and growth in Bhutan and Maldives

The business cycle analyses in DSGE models contain micro-foundations, dynamics and rational expectations, stochastic shocks to preferences, technologies and policies along with the nominal and real rigidities than present in above models. Analysis of short or long run multipliers, variance decompositions and impulse responses to changes in policies and shocks on the deviations of model variables from the steady state are often the focus of such analysis. Computations have become easier for such models after development of Sim's BVAR algorithm in the MATLAB and dynare. However we skip this DSGE aspect here as the growth and redistribution analysis in the DCGE model presented above is better suited for analysis of structural features of the South Asian economies than these DSGE models.

6.3   Strategic policy coordination models of South Asia

Interdependence among these economies and interactions could be studied using bargaining, signalling and mechanism designing concepts. Cooperative and non-cooperative games with complete and incomplete information among nations, households and firms could be used to conceptualize the issues and solutions to the problems of growth and development in these economies. There are three generations of literature in the policy coordination. First generation models include studies such as Kydland and Prescott (1977), Driffil (1988), Currie and Levine (1986) and Obstfeld and Rogoff (2000). These had found gains from coordination to be small. Cooper (1969) and Hamada (1976) and Kydland (1975) showed inferiority of the non-cooperative Nash equilibrium compared to a cooperative solution. Lucas (1976), and Kydland and Prescott (1977) used rational expectations and argued for the advantage of rule-based policies to create rational expectations equilibrium solution. Petit (1989) used differential games as did the studies of Obstfeld (1994), Sutherland (1996), Senay (1998), Martin and Rey (2000). Obstfeld (2001) and Rogoff (2002) provide an excellent review of some of the models used for policy coordination with Mundell-Fleming-Dornbush type models with little gains from coordination. Second generation models of policy coordination in Pappa (2004), Canzoneri, Cumby and Diba (2005), Clerc, Dellas

and Loisel (2011), Juillard and Villemot (2011) and Goyal (2007) find pay off from monetary and fiscal policy coordination to be bigger. Supply and strategic modelling has much improved in recent literature on the policy coordination showing more gains from coordination as stated by Conzoneri et. al.(2005), Evans and Hnatkovska (2007), Douglas and Laxton in dynare. Aarle et.al. (2002) examine the coalition formation in EMU. Recent models such as Kempf and von Thadden (2013), Dedola et al. (2013) add asymmetric information and commitment where the welfare gains can be bigger as the number of countries increase in such deals. Given this literature let us consider eight countries aiming for a policy coordination with the Nash utility frontier:

$$N_t = U_{1,t}\ U_{2,t}\ U_{3,t}..\ .U_{8,t} \tag{60}$$

Each receive utility from consuming products produced in each country:

$$U_{i,t} = F\left(y_{1,t},\ y_{2,t},\ y_{3,t.}\ ...\ y_{8,t}\right) \tag{61}$$

Goods supply process is determined simultaneously as:

$$y_{i,t} = \alpha_{i,0} + \sum_{i\neq j,j=1}^{8} \alpha_{i,j} y_{j,t} + \beta_{i,1} y_{i,t-1} + \sum_{,j=1}^{8} \beta_{i,j} y_{i,t-1} + e_{i,t} \tag{62}$$

Parameters of VAR could be interpreted in the context of Nash Policy Game as:1) In common meetings or summits they decide policies given by $\alpha_{1,0}, \alpha_{2,0},\ \alpha_{3,0}.\ \alpha_{8,0}$ but each of them face idiosyncractic shocks $e_{1,t}, e_{2,t}, e_{3,t},\ ..\ e_{8,t}$; 2) Then each country determine its action $y_{i,t}$ taking account of actions taken by others $y_{j,t}$ and such response patterns are given by parameters $\alpha_{1,2}, \alpha_{1,3},.. \alpha_{1,8},\quad \alpha_{2,1}, \alpha_{2,3},..\alpha_{2,8}\quad .\alpha_{3,1}, \alpha_{3,2}\ ...\alpha_{8,1}, \alpha_{8,2}\quad \alpha_{8,7}, \beta_{1,1}...\beta_{8,8}$ and other $\beta_{i,j}$ where $i\neq j$ and shocks $e_{1,t}, e_{2,t}, e_{3,t}..\ e_{8,t}$; 3)Each would like to get more utility and this opens the bargain; 4) The optimal solution of this game should fulfill four properties of Nash bargaining game; 5) This must be symmetric, efficient, linear invariance and IIA. Coefficient of a VAR model estimated from the time series data provides information on interactions among model economies.

7 7.Conclusion

Momentum of economic growth in the South Asian economies is analysed based on stylized facts of these economies along with trends of their fiscal, monetary, trade, education and income distribution policies. Macroeconomic, general equilibrium, trade and game theoretic models have been identified that could be applied to analyse micro, macro and sectoral issues of economic growth. Achieving higher rates of economic growth requires more systematic and scientific analysis of potentials, existing strengths and comparative advantages of these economies so that they can march ahead in the growth competition in the global economy. Policies should be consistent and comprehensive to link various sectors, regions and nations in the path for long run growth. A strong pro-growth government in India

with a good vision for the regional integration and development can turn this region into another example of economic miracles in the global economy within the next few decades.

Several strategic points for growth emerge from the analysis of facts in this paper: 1) given its size of population this region should push for growth and increase its share of global GDP up to 20 percent from roughly 6.5 percent in 2014; 2) such growth requires increasing the ratio of saving and investment about 10 percent above the current averages around 35 percent; 3) process of structural transformation should continue till both the output and employment in the agriculture sector are less than 5 percent from around 17 and 50 percent; 4) such transformation will occur as this region moves towards urbanisation so than about 90 percent of the population lives in urban areas with facilities leaving rural areas for meaningful economic uses; 5) it is important to reduce the student teacher ratios from 40 to around 16 to raise the cognitive skill of children to create human capital in science and technology; 6) then trade ratio should increase to around 100 percent from the 50 percent at this time; free trade enhances both the supply and demand sides of these economies; 7) the liquidity of the financial system need at least to treble to have a smooth flow of credits required for new and existing enterprises; 8) free convertibility of currency is essential to protect this region from international shocks; 9) a high 8 percent growth strategy is consistent with all above and requires firm commitment, efficient and strong public administration but the fruits of growth should be distributed more equally so that the gini coefficient remain under 35 percent.

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