



**An Evidence of Diverging  
SAARC Economies**

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SAARC Economies**

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## ABSTRACT

Assessment of economic-integration and disparities is essential to gain overall glimpse on regional inequalities. Regional trade and investment agreements are critical for economic integration of the regional economies and political harmony. Their contribution to integration and growth of economies is indispensable as they have been instrumental in reducing trade barriers, improving competitiveness, advancing technological options and attracting foreign direct investment. This study attempts to find income-convergence/divergence among the SAARC countries in the presence of trade liberalisation, technology accumulation, government effectiveness and foreign direct investment. Using  $\beta$ -convergence, the income-convergence or divergence is examined for the period 1999-2015. Panel estimation techniques used here takes into account regional-heterogeneity. Findings show there is a lack of inter-regional associations and SAARC as a regional-alliance did not met the expectations in terms of reaping regional benefits. Since the signing of SAPTA and SAFTA the SAARC countries have been on the path of divergence leading us to conclude that SAARC is practically ineffective at this time.

*Keywords:* Regional Economic Integration, SAARC, Income-Convergence/ Divergence,  $\beta$ -convergence, Trade Liberalisation, Technology Accumulation, Government Effectiveness and Foreign Direct Investment.

## 1. INTRODUCTION

Measuring economic-integration and disparities is crucial to gain insights on the pattern of regional inequalities. Economic-integration embraces wide-ranging capacities of socio-political, economic and cultural traits with member countries connecting together in a regional agreement. Therefore, regional agreements are gaining importance and setting steps for economic interaction in the world. Integrated economies experience reduction in trade barriers, improvement in competitive environment, and dissemination of improved technologies, all of which contribute to higher growth.

In the economic literature, the integration theory addresses two concepts related to the “course of regional- growth” and “the catching-up hypothesis”. The course of regional-growth (integration) is the notion of regional-divergence whereby pre-conditions may create difficulties for the region and thus may delay the catching-up process. The catching-up hypothesis is a notion of the regional-convergence, which states that a greater integration can drop the preliminary (initial) regional-disparities and thus in the long-run regional-convergence will take place instead of divergence.

The deep economic relationships bring two or more groups /countries/regions together, resulting in vast opportunities, promotion of income-convergence, and integration of economies. Regional economic-integration brings connectivity in regions and portrays several benefits. As observed in EBRD (2012) integration brings better trade options by lowering trade barriers, increasing market size in the region, enhancing competition in the product market, expanding intra-regional trade, supporting regional to economic and political institutions, and boosting liberalisation impacts. The role of regional agreements is indispensable. According to Iqbal (2006) some regional-associations like European Union (EU), North American Free Trade Agreement (NAFTA), Association of Southeast Asian Nations (ASEAN) managed to show that state-driven integration policies are successfully captivating challenges of international competition. The success of the regional countries, as indicated by Tonnesson (2004), is shown in terms of their capability to acclimatise regional and universal movements, encourage exports, draw attractive investments, and trained (skilled) labour, offer a favourable situation for multinational establishments, build research based foundations, employ political influence on the regional/ global level, and portraying national cultural aspect in international market.

Due to importance and success of regional groups world-wide, this study assesses economic-integration and connectivity in the South Asian Association for Regional Cooperation (SAARC) countries. Given the heterogeneous group of countries with high population growth and a volatile growth performance in the recent past, it is imperative to examine the presence of convergence/divergence phenomena in the SAARC countries. The study thus investigates the income-convergence/divergence (whether relatively poorer countries in the SAARC region incline to catch up with relatively richer countries) in the presence of trade liberalisation, technology accumulation, government effectiveness, and foreign direct investment. The overall objective is to test regional economic-integration and this study seeks to evaluate intra-group income-convergence/divergence among SAARC region. The study implements an updated version of Panel data test approach (developed by Islam 1995) for SAARC countries, as the panel data approach has the capability to control for country fixed effects allowing for long term differences in the growth path.

Rest of the study is divided as the following: the study proceeds with the literature review on income-convergence in section 2. Section 3 presents methodology, convergence tests and data information. Section 4 sets out results and discussion. Finally, Section 5 concludes the study and draws implications for policy making.

## 2. REVIEW OF LITERATURE

This section reviews literature based on the concept of income-convergence. The notion of convergence is originated from the seminal study by Solow (1956) and later it was extensively studied by the endogenous growth models. The review also covers both micro- and macro-convergences.

In the literature three known convergence hypotheses are studied:  $\beta$ -convergence hypothesis (i.e., unconditional-convergence hypothesis,<sup>1</sup> and conditional-convergence hypothesis),<sup>2</sup>  $\sigma$ -convergence and Club convergence hypothesis.<sup>3</sup> In the growth literature, we can find widely used tools for testing convergence hypothesis are:  $\beta$ -convergence<sup>4</sup> and  $\sigma$ -convergence.<sup>5</sup> Unconditional

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<sup>1</sup>According to the unconditional-convergence hypothesis, per-capita incomes of countries converge with one and another to the same terminal point (the steady state).

<sup>2</sup>According to conditional-convergence per-capita incomes of countries converge with one another (in the long-run) provided economies having dissimilar structures. They converge to different steady-state points.  $\beta$  is estimated by assuming the set of conditional structural factors. A significant negative sign of  $\beta$  confirms presence of convergence and positive significant shows divergence.

<sup>3</sup>Per-capita incomes of countries are similar in their basic fundamental features as well as initial conditions, e.g., GDP, human capital, etc.

<sup>4</sup>Neo-classical approach estimates growth of per-capita income, in specific time period, on preliminary stage of per-capita income.

<sup>5</sup>Traditional-approach measures over time dispersion of level of per-capita income across economies.

$\beta$ -convergence is considered strong convergence and is explored without conditions, while conditional  $\beta$ -convergence, termed as weak convergence, is explored with conditions. " $\beta$ -convergence" ensues while poor countries progress quickly than rich ones and poor countries catch-up with rich countries in terms of level of per-capita income. This type of convergence occurs due to diminishing returns of capital, which assumes that the rate of return has negative association to the stock of capital per-head. It is predicted that, other things being equal, states having low capital per-head grow at faster rate.

Conditional  $\beta$ -convergence [Barro (1992)] describes economies' experience with  $\beta$ -convergence that is conditional on other variables but is held constant. It is also imperative to note that the concept of convergence when tested by Barro (1991) involved regressing growth in per-capita GDP on initial level for a certain cross-sections of countries. This method was criticised by Friedman (1992) and Quah (1993) as they believed that estimates of  $\beta$ -convergence by these regressions may cause biased results. Friedman (1992) elucidates that simply finding a trend in the coefficient of variation of GDP per-capita offers an impartial estimate of  $\beta$ -convergence. Conversely, Quah (1993) suggests another methodology that can capture underlying forces of developing cross-country dispersals of GDP per-capita.

As noted by Sala-i-Martin (1994), both concepts " $\beta$ " and " $\sigma$ " convergence are beneficial as they measure convergence/divergence in a differently and provide different facts. However, " $\beta$ " convergence is superior as it explains whether deprived economies (countries/regions) are expected to progress faster than rich economies, measures the speed of convergence, clarify whether the convergence is conditional/ unconditional and whether there exist different convergence processes between countries with varying structures.

In general, two major types of analysis are identified in literature. The regression approach is the first type that studies methods for testing convergence of the traditional neo-classical growth model. In this context, the formative offerings include Baumol (1986), Barro (1991) and Barro and Sala-i-Martin (1991 and 1992). Several studies like Baumol (1986), Barro and Sala-i-Martin (1991, 1992), Barro (1991), Mankiw, *et al.*(1992) followed cross-sectional growth regressions to find convergence towards steady-state paths and the speed of convergence. Later, Islam (1995) developed an approach to test convergence by using panel data. The advantage of panel data as compared to the cross-sectional approach is the capability to regulate country fixed effects while allowing for long-term differences in the growth path. Panel data methods by Islam (1995), Caselli, *et al.* (1996), Barro and Lee (1994a, 1994b), Bond, *et al.* (2001) have been adapted to control unobserved heterogeneities and to deal with issues of endogeneity. Some researchers Bernard and Durlauf (1995), Funke and Strulik (1999), Evans and Karras (1996), Li and papell (1999), Tsionas (2000) and Zhang, *et al.* (2001) Nahar and Inder (2001) preferred the



regression approach using time-series methods as the convergence in those methods depend on the concepts of unit-roots and cointegration.

## 2.1. Studies Related to Factor Price Equalisation and Convergence

A large body of research incorporates studies in a dimension, which focus on the link between international trade and per-capita income (macro-economic convergence). Another dimension of research has shown link of international trade and factor prices (micro-economic convergence). Rassekh and Thompson (1998) examine the relationship of macro- and micro-convergences in connection with international trade. They show that factor price equalisation (FPE) theorem<sup>6</sup> offers basis for micro-economic convergence while neo-classical growth models provides basis for macro-economic convergence. The authors examine FPE through Heckscher-Ohlin trade model and equality of per-capita incomes through two sector dynamic neo-classical growth model. They show that FPE and equality of income per-capita are not the identical issues. FPE is neither obligatory nor sufficient condition for equality of incomes across economies having trade with each other. Free trade is a positive step for less developed countries as free trade is expected to lead towards FPE. Convergence of income may require trade, foreign investment, investment in education, efficient use of natural resources, etc.

Samulson (1948, 1949) specifies that trade-policy instruments distress flow of goods and services amid various countries and if countries have free trade then there can be convergence in factor prices in those countries. Giles and Mosk (2004) also identify that converging phenomena in factor-prices does not confirm convergence in output. This is because there are different dimensions of convergence. If there is convergence in one aspect, that doesn't mean convergence in other. In fact, the forces that cause divergence sometimes manage to overcome divergence phenomena, and then as a result convergence occurs.

It is essential to observe that convergence in Solow-Swan model (1956) occurs in the closed economy setting and shows convergence in levels of income. Alternatively, endogenous growth models allows for trade as steady-state growth rates become focal point. Instead, the traditional growth works [Solow (1956 and 1957); Cass (1965); Koopmans (1965)] put forward the idea that, even if universally movable goods and factors are lacking, convergence to a steady-state pathway may be observed between countries if they have matching production know-hows, population growth, savings, etc.

Ben David (1993) points out that FPE is a good option for relating trade impact on income-convergence. During trade liberalisation, convergence of per-

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<sup>6</sup>FPE theorem: international trade causes wage of homogenous labour same in all trading nations; similarly, international trade causes return to homogenous capital to be same in all trading partners, so relative factor prices are equalised across all nations.

capita income can be described on the grounds of FPE. The view is that FPE theorem is also supported by [Samuelson (1948, 1949, 1953); Helpman and Krugman (1985)] and it offers a structure for linking impact of trade to income-convergence: in the presence of free trade between two countries, FPE mechanism equalises wages on one hand and per-capita income (per worker) equalising, on the other hand, depending on relative per-capita resource endowment. Slaughter (1997) noticed that FPE explains outcome in steady-state free trade equilibrium and it doesn't say anything about trade liberalisation. According to Rassekh (2004) FPE theorem has not been addressed well in explaining the phenomena of income-convergence. The theorem shows that "under Heckscher-Ohlin-Samuelson conditions free trade would balance prices of similar factors across countries. Per-capita income is weighted average of factor prices (weights are relative factor endowments)". It is predicted by FPE that international trade disturbs per-capita incomes but equality among factor prices, due to trade, does not infer the equality of per-capita incomes.

In sum, FPE theorem holds under strict assumptions like identical linear homogenous technology, zero trade barriers, etc. FPC and FPE only address factor prices while per-capita income is a combination of factor prices and factor quantities. So per-capita income can provide divergent results if factor prices across countries are dissimilar. It cannot fully explain per-capita income-convergence.

## **2.2. Studies Related to Factors Leading to Convergence/Divergence**

Economic theory provides evidence about convergence or divergence of per-capita income levels in the presence of some specific factors. A quite large literature discusses the development of convergence and trade theories [Slaughter (1997, 2001); Ben David (1996); and Ben David and Lowey (1998)].

David and Kimhi (2004) study the relationship between trade and income-convergence over time. Their finding was that if volume of trade increases between major trading allies then any increase in rate of income-convergence may strengthen the speed of convergence among the group participants involved in intra-group trade. Increase in trade by countries show more strength in convergence process when the trade flow increase from poorer partner to the wealthier counterpart. Any increase in trade flow in other direction does not relate to changes in income-convergence.

Stroomer and Giles (2008) investigate convergence of real per-capita output to discover the degree to which the extent of trade openness may transfer output-convergence among states. They think due attention is not given to the international trade phenomena in terms of goods and services.

Choi (2009) apply panel data regressions technique and found that per-capita income, both at level and growth, converge when trade-intensity

ratio is observed on surge between countries (i.e., bilateral trade). The location and the common language of two countries matter and the effect is greater. It is concluded that the recent globalisation has contributed to narrow income and growth gaps between advanced and underdeveloped countries.

Hakro and Fida (2009) study the influence of trade liberalisation on income-convergence of South Asian states (Pakistan, India, Bangladesh, Sri Lanka) and their trade partners. They found that trade tend to root per-capita income-convergence across trading states. The effect of liberalisation policies is positive in achieving convergence. As it is argued in the literature that there are certain factors which led countries to income-convergence or income-divergence, there exist studies [Chowdhury (2004); Jayanthakumaran and Lee (2008, 2013)], which examined convergence phenomena in the SAARC countries and failed to establish convergence.

It may be useful to note that trade can be a factor that transfers knowledge and technology in open economy. This is more attainable through imports and exports and may become a reason of increase in economic growth [Grossman and Helpman (1993); Frankel, Romer, and Cyrus (1996)]. Hsiao and Hsiao (2006) examine the relationship among GDP, exports, and FDI among fast developing Asian states. Studies conducted by Ben David (1993 and 1994) measure convergence by using annual dispersion measure suggest that trade liberalisation brings income-convergence. Results of countries having same characteristics showed no convergence inclination before opting for trade liberalisation. After adopting trade liberalisation those countries showed significant convergence.

Summarising the above discussion the neoclassical growth models, predict that there is a convergence when the poorer economies grow comparatively faster than industrialised economies. Some studies tested convergence hypothesis by addressing the issue in closed economy scenario, as the Solow world doesn't allow trade. But latter some studies found a link between trade and income convergence/divergence among countries. As the global community draws benefits from trade liberalisation/integration through its impact on economic development hence, it is needed to see if regional agreements are playing role in reducing/increasing disparities among countries.

### **3. OVERVIEW OF THE SAARC ECONOMIES**

With a cherished goal of regional economic-integration, the SAARC was established in 1985. Its current participant countries include Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka. Geographically these countries are located close to each other but vary significantly in terms of their GDP, population, and land size. At policy

level the aim of the alliance was to establish regulatory mechanisms and create enabling environment to optimally utilise available resources for intra-regional trade and socio-political enhancements in the region. Thus, SAARC was expected to support the mutual self-reliance efforts of the region. Since 1985, SAARC has made very slow progress despite continuous efforts both in terms of establishing institutions and introducing programs. Despite these efforts, very limited success is witnessed on account of trade and investment. The main reason is that SAARC activities failed to address priority areas and lack regional-connectivity.

Given the importance of preferential trading arrangement, the SAARC member countries signed South Asian Preferential Trading Arrangement (SAPTA) in 1991, which was meant to boost mutual-trade and the economic-cooperation among member countries. With time it was observed [Solarin, *et al.* (2014)] that most of the actions in the agreement were by no means instigated which, in 2006, steered to the initiating of South Asian Free Trade Area (SAFTA). The new agreement, SAFTA, was likely to maximise the development initiatives among the SAARC countries. To serve the purpose two types of trading conditions were agreed upon considering the countries in developing and least developed groups. The strict conditions were agreed for India, Pakistan and Sri Lanka, while some mild conditions were introduced for Bhutan, Bangladesh, Maldives and Nepal. Iqbal (2006) states “since its inception, there have also been serious differences among member countries over the aims and functioning of SAARC” and he came up with a conclusion “Nevertheless, after 21 years of establishment, neither South Asian nations have been able to push the process of integration into full swing nor the organisation itself has become viable enough to promote peace, harmony and economic-integration or prevent conflicts in the region” . Lama (2010) has also explained that the SAARC as a regional-alliance didn’t meet the expectations in terms of attaining its paybacks to the individuals and organisations in the arena. Economically, limited paybacks of SAFTA were observed, as due to political conflicts, the member countries failed to meet at summits [Bandara and Yu (2003)].

Per-capita income growth performance of the SAARC countries is shown in Table 1. Per-capita income growth rates are calculated and presented year-wise. The last row in Table 1 shows overall growth rate of the South Asian economies included in the sample. Over the period of seventeen years, the growth rate of the Indian economy is at the highest followed by Sri Lanka, Bangladesh, Nepal and Pakistan. Neither country covered in the sample has shown impressive growth in spite of adopting several liberalisation measures. This snapshot provides us motivation to carry on further analysis to see if SAARC countries are gaining from the benefits of regional-economic agreements or not.

Table 1

*Per-Capita Income Growth Rates of SAARC Countries*

Year	Bangladesh	India	Nepal	Pakistan	Sri Lanka
1999	–	–	–	–	–
2000	0.03	0.02	0.04	0.01	0.05
2001	0.03	0.03	0.03	-0.002	-0.02
2002	0.01	0.02	-0.01	0.01	0.03
2003	0.02	0.06	0.02	0.02	0.05
2004	0.03	0.06	0.03	0.05	0.04
2005	0.04	0.07	0.02	0.05	0.05
2006	0.05	0.07	0.02	0.04	0.06
2007	0.05	0.06	0.02	0.02	0.05
2008	0.04	0.02	0.05	-0.003	0.05
2009	0.03	0.06	0.03	0.007	0.02
2010	0.04	0.08	0.03	-0.004	0.07
2011	0.05	0.05	0.02	0.006	0.07
2012	0.05	0.04	0.03	0.01	0.08
2013	0.04	0.05	0.02	0.02	0.02
2014	0.04	0.05	0.04	0.02	0.03
2015	0.05	0.06	0.01	0.02	0.03
1999-2015	0.96	1.31	0.56	0.36	1.08

*Source:* Own calculations based on data obtained from WDI.

#### 4. FRAMEWORK AND METHODOLOGY

To test regional economic-integration the present study seeks to evaluate intra-group income-convergence among SAARC region. Two known  $\beta$ -convergence tests, unconditional-convergence (without conditions) and conditional-convergence (with conditions), are applied. Conditional-convergence is examined by considering trade liberalisation (indicated by openness indicator) and technology accumulation (patents), government effectiveness, and foreign direct investment. A GMM technique [Blundell and Bond (1998)] is applied to test due to suitability on panel data. Selection of random effects and fixed effects models are based on Hausman (1978) testing. The technique captures both individual-specific effects and time-effects. Due to the expected problem of endogeneity, GMM-technique is found to be most suitable. Data have been taken for five SAARC countries<sup>7</sup> ranges from 1999-2015. To solve the issue of multicollinearity, Variance Inflation Factor (VIF) test is applied. Data has been checked for stationarity. Panel unit-root methodology developed by Im, Pesaran and Shin (2003) Levine and Lin (1993 and 2002) and

<sup>7</sup>Five SAARC countries are selected for our analysis on the basis of data availability. They are Bangladesh, India, Nepal, Pakistan and Sri Lanka.

is adopted to investigate stationarity properties. It is important to note that Im, Pesran and Shin [IPS (2003)] test is used for heterogeneous patterns. This study is based on macro panel data.

Following Sala-i-Martin (1996), Equation 1 is used to test  $\beta$ -convergence:

$$y_{it} = \alpha_i + \beta y_{it-1} + \mu_{it} \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad (1)$$

where,

$y_{it}$  per-capita income in log form,  $\alpha_i$  is a constant for country  $i$ , No of countries will be shown by  $i$

$\mu_{it}$  is error term.

Rewriting Equation 1 in standard alternate form, for unconditional-convergence, is given as:

$$\ln\left(\frac{y_{it}}{y_{i,t-1}}\right) = \alpha_i + \beta \ln(y_{i,t-1}) + \mu_{it} \quad \dots \quad \dots \quad \dots \quad \dots \quad (1a)$$

where,

$Y_{i,t-1}$  is income per-capita in country  $i$  in base year,  $Y_{i,t}$  is income per-capita in country  $i$  in final year,  $\alpha$ ,  $\beta$  are parameters, and  $\mu_{it}$  is error term.

Rewriting, Equation (1), in standard alternate form, for conditional-convergence which now includes a vector of control variables.

$$\ln\left(\frac{y_{it}}{y_{i,t-1}}\right) = \alpha + \beta \ln(y_{i,t-1}) + \theta X_{i,t} + \eta_t + v_i + \mu_{it} \quad \dots \quad \dots \quad (2b)$$

where,

$Y_{i,t-1}$  is income per-capita in country  $i$  in base year,  $Y_{i,t}$  is income per-capita in country  $i$  in final year, while  $\alpha$ ,  $\beta$  are parameters to be estimated,  $\mu_{it}$  is error term and  $X_{i,t}$  is the vector of control variables. The significantly negative coefficient  $\beta$  will demonstrate presence of convergence.

#### 4.1. Data

Data are taken from World Development Indicators (WDI) by the World Bank, the World Intellectual Property Organisation (WIPO), the United States Patent and Trademark Office (USPTO) and Penn World Tables. We employ panel data model that consists of 17 time-series of 5 cross-sections. Variables are constructed carefully and explained as follows:

Data of capital and labour are taken from Penn World Tables (version 8.0) and capital labour ratio has been calculated by taking capital stock constant 2011 national prices divided by number of persons engaged in millions. As a representative of trade liberalisation, an index of trade openness has been

constructed. Data of imports of goods and services (current US \$) and exports of goods and services (current US \$) of all five countries, taken from WDI, are added and then divided by each country's GDP at current US\$. As a representation of Governance in our model, data of government effectiveness, from WDI, are taken for five selected SAARC countries. As a representative of technology accumulation, data of patent filing are taken in cumulative form. Net foreign direct investment (FDI) (current US \$) is divided by the GDP deflator.

## 4.2. Results and Estimation Procedure

In studying  $\beta$ -convergence, two main concepts are originated specifically unconditional (strong) and conditional (weak) convergence. Unconditional-convergence occurs, when the differences in per-capita income are momentary among countries and only due to preliminary conditions. The concept is based on regression towards mean as discussed by [Barro (1984 and 1992); Baumol (1986); DeLong, *et al.* (1998)]. While conditional-convergence occurs if these differences are lasting and due to cross-country structural heterogeneity [Durlauf, *et al.* (2005)]. Conditional  $\beta$ -convergence [Barro (1992)] describes economies' experience with  $\beta$ -convergence that is conditional on other variables but is held constant.

### 4.2.1. GMM Approach to Test Convergence

This section uses GMM (Blundell and Bond, 1998) method to estimate the dynamic equation of convergence among Asian countries. Adopting this approach in panel estimation procedure, potential endogeneity that may emerge from explanatory variables has been controlled. The unconditional<sup>8</sup> and conditional-convergence<sup>9</sup> results have been estimated. The common methods applied in the panel data methodology are fixed effects and random effects. We apply dynamic income model with fixed effects<sup>10</sup>. Stationarity has been checked for all variables prior to estimations. Unconditional  $\beta$ -convergence is tested and reported in Table 2.

Table 2

<i>Un-conditional <math>\beta</math>-Convergence</i>				
	$\beta$	T statistics	Probability	Durbin Watson
SAARC Countries	0.82**	3.57	0.0007	1.66

*Note:* \*indicate significance at 10 percent, \*\*indicate significance at 5 percent level.

$$^8 \Delta y_{it} = \alpha_i + \beta y_{it-1} + n_i + v_{it}$$

$$^9 \Delta y_{it} = \alpha_i + \beta_1 y_{it-1} + \beta_2 X_{it} + V_i$$

<sup>10</sup> Based on Hausman (1978) test.

The model, estimating unconditional-convergence, has no explanatory variable except the lag of income itself. Unconditional  $\beta$ -convergence is tested here through GMM technique. It should be noticed that the coefficient of growth rate variable is significantly positive. This confirms the SAARC group of countries is not showing unconditional income-convergence toward steady-state. In fact there is evidence of significant income divergence which is because SAARC member countries experienced dissimilar policy experiences. Although, not having all characteristics similar, the SAARC countries have similar historical and cultural contacts.

Moving forward, the income divergence provide basis to test conditional-convergence, the concept given by Barro (1991) and Mankiw *et al.* (1992). Barro (1991) found that poor economies converge towards rich countries differing on initial levels. Mankiw *et al.* (1992) presented results of conditional-convergence for neo-classical growth models, by considering cross-country dissimilarities in steady-state income where countries converge to their long-run steady-states respectively. As the challenge to effective cooperation and nature of interaction among economies has always remained in focus, economies act in response to factors that may or may not promote cooperation. There are multiple factors responsible for economic growth like accumulation of resources, savings, investments, liberalisation policies, and technology. Such cooperation among two economies grows as evidenced by increased bilateral trade, deepening of interregional forums (such as SAARC), and representation at international forums (like WTO). Following theoretical literature, and keeping in view the importance of economic-integration among Asian countries, conditional  $\beta$ -convergence is estimated for the SAARC region. Results are presented in (Table 3).

Table 3  
*Conditional-Convergence/Divergence in SAARC Countries*

GROUP	$\beta$	KL	OPN	T	GN	FDI	GN*T	OPN*FDI	R2	D.W	P-JStat
SAARC	1.96**	2.47E-05**	0.57**	-0.64**	-5.88**	-3.60E-10	0.84**	8.62E-10	0.65	2.76	0.56
	(4.16)	(3.98)	(6.34)	(-3.12)	(-2.38)	(-5.40)	(2.46)	(5.22)			

Note: \*indicate significance at 10 percent, \*\*indicate significance at 5 percent level.

Conditional-convergence is tested by GMM Blundell and Bond (1998) taking into account some conditions: trade liberalisation (openness), technology accumulation, government effectiveness, and FDI. It is noted that the coefficient of growth rate is still significantly positive and confirms divergence in “SAARC” group.



Trade openness is positively significant which means due to adoption of liberalisation policies SAARC countries tried to reduce barriers to trade and there was improvement in market competition. In recent years liberalisation policies have gained strength in developed as well as developing countries. Achieving persistent growth in developing countries, flow of goods and services is important and this rising flow of capital across national boundaries contribute to economic growth [Goldberg and Pavnick (2007)]. The sample countries Bangladesh, India, Nepal, Pakistan and Sri Lanka were considered under umbrella of SAARC in 1985. It is argued in literature that countries are gradually integrated by free trade by removing barriers to trade. It was expected that SAARC countries will adjust to new standards and regulations and these measures will reduce investment risks in the region. It is clear from positively significant coefficient of openness that in the SAARC region liberalisation efforts are significantly adding towards growth but the effect is offset by the negative impact of technology adoption, government effectiveness, and foreign direct investment position.

Commonly, it is seen that trade liberalisation increases competition, and improves FDI opportunities in a country, and in presence of effective governance and improved technology adoption policies may take countries converge to a mutual point (steady-state). In case of SAARC region, certain issues need to be addressed. As seen in Table 3, the negative sign of technology adoption, government effectiveness, and foreign direct investment may hamper growth in the region. Moreover as observed in the performance of these countries under the SAARC agreement, there are serious peace and coordination issues among SAARC countries. Several times there emerged uneasy situation among member countries, there have been governance issues and these countries lost good FDI opportunities, which badly affect this regional-association. SAARC activities failed to address the important issues and lack regional-connectivity. In spite of many efforts the region failed to converge towards a mutual steady state point. Our results are consistent with Chowdhury (2004) who examined convergence for the period 1960–2000, in SAARC countries and remained unsuccessful to find convergence in these economies. Similarly, Jayanthakumaran and Lee (2008, 2013) observed the income-convergence among five SAARC countries but didn't get any evidence of convergence.

We have incorporated and tested the policy mix variable in our analysis, the joint impact of governance and technology (GNxT) and openness and FDI (OPNxFDI) interactive variables are positive and significantly contributing towards growth in the SAARC region. This clearly shows that, if SAARC members harmonise their policies; they are likely to get positive impact of adopting patent filing in presence of effective governance. On the other hand, openness and FDI interactive variable show a good turnover in the region but since FDI is already low, it would be useful to create peaceful and conflict free environment to attract FDI.

Table 4  
*Comparison of Unconditional and Conditional  $\beta$ -Convergence/  
 Divergence: 1999-2015*

	Unconditional Convergence/Divergence	Conditional Convergence/Divergence
SAARC	0.82** (1.72)	1.96** (4.16)

T values in parenthesis, \*significant at 10 percent, \*\*significant at 5 percent.

In Table 4 unconditional and conditional-convergence (GMM approach) results are presented for comparison. The group “SAARC” has provided evidence of significant divergence in both cases. Results show that in spite of adopting liberalisation and technology adoption measures, the SAARC countries have observed income disparities. The results get support from the finding of EBRD (2012) that regional economic-integration is encountered with numerous challenges while minimising negative effects on economic links with outer world and such effects usually happen in the presence of trade diversion. Another conclusion can be drawn on divergence of per-capita income in the SAARC countries is on the basis that FPC and FPE only address factor prices while per-capita income is a blend of factor prices as well as factor quantities. In some cases per-capita income may provide divergent results if factor prices across countries are dissimilar. It cannot fully explain per-capita income-convergence.

It is clearly seen from results that the SAARC countries failed to show any impressive performance. Some of the studies also confirm these results. As observed by [Thapar (2006)] trade among the SAARC countries remained inadequate despite of their adjacent locations. This is due to the reason that per-capita incomes of countries are not alike in their basic (fundamental) features as well as initial conditions and the SAARC club shows divergent results. As seen earlier, it is argued in literature that in reality countries are not having similar characteristics and it is not possible to converge to same ratios and same growth rates. Our results are consistent with [Sala-i-Martin (1996)] that unconditional-convergence and conditional-convergence hypothesis, coincide only in the case provided all selected economies have same steady-state. Overall, the integration efforts in the region failed and are mainly due to the reasons (clashes among states and non-cooperative behaviour of member states, cultural rigidities, power dilemma, preference for bilateral agreements, human rights exploitations and uncontrolled manipulations) as are also pointed by Jayanthakumaran and Lee (2013) and Thapar (2006).

## 5. CONCLUSION AND POLICY IMPLICATIONS

Economic-integration among countries contributes to higher growth and improved efficiency in production. Therefore, regional agreements are gaining importance and setting stage for political and economic interaction worldwide. This study focuses on economic-integration and connectivity in the selected South Asia region countries, a group of heterogeneous countries.

A comparison of unconditional and conditional-convergence results show no sign of income-convergence in the selected SAARC countries' group and indeed provide evidence of significant income-divergence. This shows that the SAARC countries have dissimilar characteristics despite the fact they have common historical and cultural links. This is mainly because these countries have very different policy experiences. It can thus be concluded that since the SAARC countries do not have similar characteristics which does not allow them to possibly converge to common ratios and similar growth rates. In fact, in the presence of regional-agreements such as SAPTA and SAFTA, the SAARC economies are diverging in terms of income. This leads to conclude that the regional countries do not have any basis to carry on with this, a virtually odd alliance under the current situation. The integration efforts in the SAARC region have repeatedly remained unsuccessful due to peace clashes among states and non-cooperative behaviour of member states, and supremacy dilemma among member states. Unless all the SAARC countries make collective and cooperative efforts that ensures benefits to all participants, income convergence that is direly needed for sustained and inclusive growth would remain a remote possibility.

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