RIS A Think-Tank of Developing Countries

RIS is a New Delhi-based autonomous policy think-tank supported by the Government of India and devoted to trade and development issues. Its work programme focuses on policy research and capacity building on multilateral trade and financial negotiations, regional economic cooperation in Asia, South-South cooperation, new technologies and development, and strategic policy responses of developing countries to globalization, among other issues. The work of RIS is published in the form of research reports, books, discussion papers, policy briefs and journals.

RIS has networked effectively with other prominent policy think-tanks, government agencies, industry bodies and international organizations in Asia and other parts of the world for collaborative research and joint activities. It has a consultative status with UNCTAD, and has been accredited to the Summit Meetings of NAM and WTO Ministerial Conferences. It has conducted policy research and other activities in collaboration with other agencies, including UN-ESCAP, UNCTAD, UNU, Group of 77, SAARC Secretariat, Asian Development Bank (ADB), the World Bank, and the South Centre.

For more information about RIS and its work programme, please visit its website: www.ris.org.in.

— Policy research to shape the international development agenda

RIS
Research and Information System for Developing Countries

Core IV-B, Fourth Floor
India Habitat Centre
Lodhi Road
New Delhi-110 003, India.
Ph. 91-11-2468 2177-80
Fax: 91-11-2468 2173-74-75
Email: dgoffice@ris.org.in
Website: http://www.ris.org.in
Website: http://www.newasiaforum.org

RIS Discussion Papers

Addressing Global Growth Asymmetries through Regional Trade Integration: Some Explorations

Ram Upendra Das
Ramaa Sambamurty

December 2006

RIS-DP # 116

RIS
Research and Information System for Developing Countries

Addressing Global Growth Asymmetries through Regional Trade Integration: Some Explorations

Ram Upendra Das
Ramaa Sambamurty

RIS-DP # 116

December 2006

RIS
Research and Information System for Developing Countries
Core IV-B, Fourth Floor, India Habitat Centre
Lodhi Road, New Delhi – 110 003 (India)
Tel: +91-11-2468 2177/2180; Fax: +91-11-2468 2173/74
Email: dgoffice@ris.org.in

Acknowledgement

Authors are grateful to Dr. Nagesh Kumar for his motivation and insights towards this paper.The usual disclaimer applies.

Addressing Global Growth Asymmetries through Regional Trade Integration: Some Explorations

Ram Upendra Das*
Ramaa Sambamurty**

***Abstract*:**Globalization process has entailed trade openness, greater emphasis on foreign direct investment, stabilization policies, redefining the role of the state, among others. Given that another major global trend observed is one of regional trade integration, the paper explores whether due to this trend there has been any concrete relationship with the growth convergence/divergence outcomes. Tests of Beta-convergence under different model specifications suggest that over time developed and developing countries have not converged in terms of their real per capita GDP though they have converged within their own groups of developed and developing countries. Thus, it is concluded that regional trade integration leads to growth convergence regionally and both openness to global trade and regional trade openness are important. However, the results of the paper need to be interpreted with caution due to the presence of non-stationarity, though the problem is not uniform across variables, tests and regional groupings. A policy inference that can be drawn is that at the global level 'economic cooperation for economic growth convergence' needs to be flagged and appropriate institutional mechanisms created to intensify the processes of trade and FDI integration. Broadly, the results are in consonance with the predictions of the New Growth Theories.

I. Introduction

The global trends in economic growth across countries have traversed different economic regimes over the past decades. In the more recent decades, the globalization process has entailed decisive policy changes, the world over. It has entailed trade openness, greater emphasis on foreign direct investment, stabilization policies,

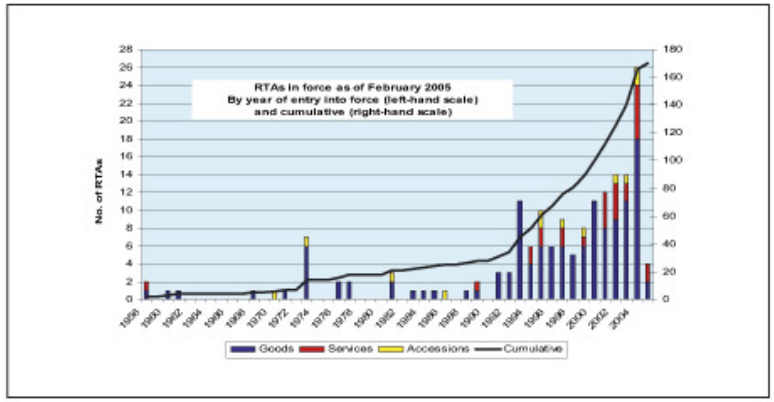
* Fellow, RIS.
** Research Assistant, RIS.

redefining the role of the state, among others. Observations reveal that there have been positive growth outcomes in both the developing and developed worlds. However, it has also been noticed that while the developing world has been unable to reap the full benefits in terms of economic growth across countries, the developed world has also shown signs of growth-sluggishness in country-specific contexts.

Another major global trend has been in the realms of trade interactions among countries. Along with the advent of WTO, in contrast to previous decades, the last decade has witnessed a growth of regional trading arrangements (RTAs) at an unprecedented pace (Chart 1). By January 2005, around 312 RTAs were notified to GATT/WTO (Crawford and Fiorentino, 2005). As of 15 June 2006, about 197 RTAs were in force (WTO, 2006). It is important to highlight that a major increase in the number of RTAs took place between now and 1995. A rather well known fact is that around two-thirds of global trade is conducted on a preferential basis than the MFN basis.

A scenario such as above throws up the question whether the growth-inducing policies have been successful in achieving the envisaged objectives in different countries. Another obvious question arises whether the world has moved towards growth-convergence or it is marked with growth

Chart 1: Notified RTAs to the GATT/WTO (1948-2005) by entry into force



Source: (Crawford and Fiorentino, 2005)

asymmetries. Moreover, it is time to ask whether the increasing regionalism that the world has been witnessing has any concrete relationship with the growth convergence/divergence outcomes. These issues are addressed in this brief paper both analytically and empirically. In so doing, an analysis of country-specific growth performance in the last few decades is examined. Further, a more rigorous global macro level analysis is undertaken to complement the country-specific analysis. Finally, an attempt has been made to analyze the issue of growth convergence/divergence in different prominent regional groupings.

In Section II some of the analytical arguments on the subject are presented through a brief literature review. In this context, arguments underlying the regional integration process are summarized. Section III provides the methodological framework, variables and data related issues. Results are presented in Section IV, which explores into the growth performance of the countries in the era of globalization and regionalism and asymmetries or convergence therein. The issue of growth asymmetry between the developed and developing worlds is also addressed. Furthermore, results on global growth-convergence have been examined with the help of a large panel data set pooling a long time-series with a large cross-section of countries, including those pertaining to prominent regional groupings. In Section V, some concluding remarks are made on global growth-convergence and the importance of policies that the process of globalization and regional integration processes have necessitated.

II. Analytical Arguments: Literature Review

Income inequality between countries is sometimes denoted as "international inequality", as distinct from "global inequality" which may account for the inequality both between and within countries (Milanovic, 2005). The latter concept would thus account for differences in income between all individual citizens of the world.

However, inter-country growth asymmetries are very important and to an extent the above-mentioned distinction can be ignored. There is a strong logic as to why growth asymmetries among the world's nations are important to be considered. It has been observed by various studies that

when considering income inequality among all the people in the world, about 70 per cent is explained by differences in incomes between countries and merely 30 per cent by inequality within countries (Bourguignon and Morrisson, 2002; Milanovic, 2005). These studies also found that during the first half of the 20th century, it was inequality within countries that appeared to be more important. 'While this does not make the disparities within countries any less important, it is striking that global inequality increasingly has become a problem conditioned to where one happens to live' (UN, 2006).

However, despite considerable research on this subject, inter-country income disparities have remained a debatable issue. In our understanding, this is primarily due to inherent weaknesses in different growth models. That the rich and poor economies would eventually converge in terms of income levels in the long run was the inference drawn on the basis of the standard economic model of growth that had focused primarily on the role of savings and investment. However, global growth disparities continued to be observed. Thus, to explain a lack of growth-convergence, attempts were made to extend the growth models to include other factors of growth such as human capital and endogenous technological change in its incarnation in the 'new growth theories'.

The new growth theories sought to shed more light on the linkages between openness and growth by taking into account the technology factor. According to this, openness creates opportunities for countries in terms of enhancing access to a global pool of technology. Technological advancements thus achieved create growth dynamism in the economy as decline in marginal productivity of capital is arrested due to increasing returns to the knowledge factor. Therefore, growth profiles can be enhanced and sustained and income convergence among countries can be achieved (Romer, 1986; Lucas, 1988; Scott, 1989 and others). One of the channels that this may happen, based on the insights from the new growth theories, is through the trade and FDI integration both globally and regionally.

Despite such advancements in analytical constructs the empirical evidence does not present a clear picture on this issue under consideration.

At the one end of spectrum, there are analysts who provide empirical evidence in favour of trade and investment liberalization in terms of their growth-effects. For instance, Sachs and Warner (1995) have found that developing countries with open economies grew by an average of 4.5 percent per year in the 1970s and 1980s while those with closed economies grew only by 0.7 percent. However, this relationship between trade liberalization and economic growth has been contested by various studies (Rodriguez and Rodrik, 1999; Rodrik, 2001). Most recently, the arguments advanced in favour of positive impacts of trade and investment liberalization on growth, in an inter-country setting have been challenged by Birdsall (2006), UN (2006) etc.

Two important aspects need to be highlighted on the basis of the foregoing discussion: firstly, tackling inter-country growth asymmetries are very crucial for reducing income disparities among the peoples of the world and second, the analytical and empirical literature remains far from being conclusive on the subject. Therefore, the present paper probes empirically into the issues and attempts at finding the plausible reasons for observed global growth trends. This could provide insights relevant for growth theories as well as growth-augmenting policies in the global and regional contexts.

In this paper focus is on what is technically known as 'international inequality', however, since within country disparities are too well known and obvious, we maintain that this paper is actually addressing the concerns of global asymmetries.

Growth Convergence and Regional Integration

One of the major changes in global trade policy making process is manifested in greater regional trade integration. On the new wave of regionalism it is considered that it is often competition-driven and technology-driven (Dubey, 1998). From this, the attempts to link global growth convergence and the process of regional economic integration are not very new, however the inferences drawn by various studies have remained far from being conclusive.

Vamvakidis (1998) in one of the early attempts tried to answer the question whether regional trade agreements had any impact on growth. His

empirical evidence showed that there was a case for smaller economies entering into such arrangements with larger economies for growing faster. Cappelen et al. (2000) found in the case of the EU that regional integration and financial support may have succeeded in improving EU's regional policy in generating growth in poorer regions and contribute to greater equality in productivity and income in Europe.

Berthelon (2004) introduced a new measure of regional integration by interacting country membership to a regional grouping and the partners' share of world GDP, which allows capturing differentiated effects depending on the size of the partners. His results indicated that regional integration has influenced growth positively. In addition, he finds that North-North agreements have significant growth effects; South-South agreements have ambiguous effects depending on the size of the countries joining them, and that there is no clear answer for North-South agreements.

Martin and Ottaviano (1996) have argued that trade integration leads to a higher growth rate in the integrated area due to the spatial agglomeration of economic activities. The endogenous growth theory recognizes the importance of public policies in the determination of long run growth rates. If public infrastructure is an input in the production function, then an increase in public infrastructure raises the marginal product of private capital, which leads to an increase in capital accumulation and growth (Barro, 1990). In a neoclassical framework, such supply side policy thus may speed up the convergence process as the marginal product of private capital increases with the provision of public capital. According to the literature on "economic geography" (Krugman, 1991; Venables, 1996) the relation between geography and the factors that affect it is not linear and owing to the strong emphasis put by regional policies on the financing of public infrastructure, their effect also works through an effect on transaction costs (Martin, 1997).

The traditional theory of gains from free trade suggests that removal of trade barriers allow consumers and producers to purchase from the cheapest and most competitive source of supply. This enhances efficiency and increases welfare. However, by introducing the concepts of 'trade

creation' and 'trade diversion' it was argued that the net effect of trade liberalization on a regional basis is not necessarily positive (Viner (1950). In other words, gains from efficient sources of supply in a regional grouping (i.e. trade creation) could be offset by sourcing products from inefficient regional partners (trade diversion).

However, the question whether a particular regional grouping is trade creating or trade diverting has remained an empirical one. Studies undertaken do not entail any definite conclusion on the net welfare effect of trade creation and diversion (Pomfret 1988). According to Bhagwati and Panagariya (1996) if members of the regional trade agreement are small in relation to the outside world, possibilities of trade creation will be very little.

On the other hand, against the abovementioned conclusions it is argued that trade creation or diversion are static concepts. While evaluating any RTA not only static trade effects are to be considered but also the dynamic effects of regional integration need to be taken into account. Dynamic effects of forging regional alliance includes market expansion effect i.e. the achievement of economies of scale and the ability to choose the best locations for production and distribution as trade barriers are removed and markets expand; competition enhancement effect i.e. facilitation of efficient production because companies with oligopolies in the region are made more competitive by market integration (Urata 2002). Other dynamic effects include accommodating specialization and division of labour, promoting technical efficiency and terms of trade effects etc.

This brings us to the issue of the role and logic of regional groupings in achieving growth-augmenting effects, hence growth convergence in a regional grouping. It can be argued that trade in goods can further be stepped up by facilitating concomitant trade in services. For instance, trade in goods is incumbent upon the presence of facilitative services like post-shipment credit, consignment-insurance, bank-guarantees, shipping services etc. that not only facilitate trade but also contribute to the competitiveness of exports. On the other hand, trade in services in a sector like health is dependent upon trade in goods pertaining to this specific service sector

such as medical equipments and medicines that the health service providers are confident of. Thus, the region needs to recognize the two-way linkages in trade in goods and services.

Further, it has also been noticed that trade flows are often a corollary to investment flows. Investment integration facilitates restructuring of an industry across a region on the most efficient basis so as to exploit the economies of scale and specialization. These efficiencies lead to generation of income and hence can act as the drivers of trade and growth.

In addition, the trade-investment linkages run in both the directions. While a free trade agreement can spur investment flows in terms of efficiency-seeking regional restructuring, it is the trade-creating joint ventures that ultimately have a decisive impact on regional trade flows. The trade-creating joint ventures are in a position to take advantage of the regional freer trade agreement. This has been observed in various studies like Kumar (2005), Kelegama and Mukherji (2006), RIS (2002), among others.

In a dynamic scenario, vertical integration and horizontal specialization in a regional grouping could be focused upon with the help of cross-country investment flows that strengthen trade-investment linkages. This may essentially mean distribution of different stages of production in a particular industry regionally in an integrated manner viz. the vertical integration and specialization in the same stage of production with the help of product differentiation across the region viz. the horizontal specialization (Kumar, 1998, Das, 2004, among others). Furthermore, within the ambit of regional trade integration, the specific nature of formulating rules of origin can also bring about an interface between trade-augmentation and achieving growth and developmental objectives (Panchamukhi and Das, 2001).

The upshot of above is that by recognizing the agglomeration, specialization and scale effects in a regional grouping along with the linkages achieved between trade in goods and services and trade-investment on the other, growth-inducing effects can be obtained and subsequently this could help achieving growth convergence in a regional grouping. This can be further enhanced through rules of origin stipulations if formulated efficaciously.

Methodologically, in this regard, various attempts have been made to link growth with regional integration using regression techniques (Vamvakidis, 1998; Cappelen et al., 2000). More recently, there have been studies on growth convergence in individual regional groupings (Athanasios G. Tsagkanos, et al., 2006). Our paper takes a step forward by establishing a link between growth convergence and regional integration, using robust econometrics tools to support the theoretical intuition that primarily the regional trade openness is an important policy instrument to achieve growth convergence within a regional grouping. However, in this context a variable of openness vis-à-vis the global market has also been taken alongside the regional trade openness variable. The next section provides the empirical framework of the analysis suggesting as to how our paper builds on the earlier work on the subject and provides fresh insights.

III. Methodological Framework, Data and Variables

In the empirical literature, growth-convergence or divergence has been evaluated with the help of various techniques. Of which, the β-convergence approach is considered to be the most robust way of estimating the growth of GDP per capita over a certain period of time in relation to its initial level. One may hasten to add that GDP per capita is a better measure of an economy's growth process as opposed to GDP *per se* as the former serves as a proxy for the average material well-being of people and often reflects the average standard of living in a country. In order to make GDP per capita comparable over time an even better measure for this purpose is the real GDP per capita.

It may be highlighted that there are two types of convergence: unconditional and conditional (Sala-i-Martin, 1994). When all countries converge to the same terminal point (steady-state point) the convergence is called *unconditional*. In this type it is assumed that countries do not differ significantly structurally. However, this is a very strong assumption. When countries have different economic structures, it is assumed that they converge to different steady-state points (Baumol, 1986). In this case convergence is called *conditional* and both the coefficient β and the structural variables (influencing the level of growth of real GDP per capita) are introduced in the model.

However, before exploring the issues of global asymmetry in the framework of β–convergence more rigorously, an attempt has been made to complement it with a country-specific treatment of the issue in order to blend the micro and macro perspectives.

Based on the above understanding, we have explored the issue of global growth asymmetries in the following six steps:

(i) Growth asymmetries among the developing countries
(ii) Growth asymmetries between developed and developing countries
(iii) *Unconditional* β–convergence for developed and developing countries together
(iv) *Conditional* β–convergence for developed and developing countries together
(v) *Conditional* β-convergence for developed and developing countries separately
(vi) *Conditional* β-convergence for prominent regional groupings separately

In the first of these steps a comparison is made in the average annual growth of per capita GDP (constant 2000 US $) between the 1980s and 1990s for 153 developing countries taken from World Bank (World Development Indicators). The results of intra-developing country growth divergence are presented in Chart 2.

In analyzing the growth asymmetries between developed and developing countries, as a second step, a comparison is made in the average annual growth of per capita GDP (constant 2000 US $) between the 1980s and 1990s for 22 developed and 153 developing countries. The results are presented in Chart 3 but only for those developed countries that have experienced a positive movement in their real GDP per capita and those developing countries that are characterized by a negative change in their real GDP per capita over the period under consideration. This helps in bringing out the divergent growth experiences in the developed and developing worlds on an illustrative basis. In a quest to complement the

first two steps of studying growth asymmetries in a country-specific setting we move on to explore the issue in greater depth with the help of more rigorous estimation techniques.

Hence, at the third step, this study tests the *unconditional* β-convergence hypothesis, respectively, using a panel data of 104 countries[1] of the developing and developed worlds together for the period 1971-2003. Data has been divided into four sub-periods 1971-1978, 1979-1986, 1987-1994 and 1995-2003.

Under the β-convergence framework the following equation has been estimated econometrically:

$$(\log Y_{Tt,I} - \log Y_{0t,I})/n_t = \alpha + \beta \log(Y_{0t,i}) + \varepsilon_{t,I} \qquad \text{(i)}$$

where, $Y_{Tt,I}$ refers to the real GDP per capita in the last year of period t (t = 1,2,3,4,….. the corresponding sub-periods) for country i, $Y_{0t,I}$ is the value of real GDP per capita in the initial year of period t, n_t is the number of years and T the last year in period t.

If the regression coefficient β has a negative sign it indicates that real GDP per capita of countries with lower initial real GDP per capita grow more rapidly than the set of countries with higher initial real GDP per capita.

This would imply convergence after t time-periods. However, an opposite result would mean that countries would not experience growth-convergence over time. The results presented in Table 1 are based on the estimated equation (i).

The same set of data was also used to estimate the *conditional* β-convergence in the fourth step by further augmenting the model with additional variables (data sourced form WB, World Development Indicators). These are Government Consumption (GC) as a percentage of GDP, trade openness of the economy (OP) as imports as percentage of GDP, the FDI as percentage of GDP (FDI) and percentage of annual inflation

(INF) as a deflator of GDP. These variables have been chosen on the basis of our own inferences drawn from various economic growth theories and some of them used in other empirical studies on the subject.

Government Consumption is expected to have a negative relationship with growth rate of per capita GDP. Intuitively, although in the short run government spending may prove to be beneficial for growth, in the long run it may hamper growth with the rise in debt levels as a result of excessive government spending. Inflation also has a negative impact on growth in the long run; however, a minimum level of inflation is necessary to provide incentives to the producers. On the contrary, openness of the economy, as measured by imports as percentage of GDP (ideally, export to GDP ratio need not be included as a trade openness policy variable since export openness at the policy level have increasingly involved import openness of the destination country), and greater foreign direct investments, understandably as per the present economic realities, give an impetus to the economic growth and thus expected to have a positive relationship with growth of per capita GDP.

Based on the above explanation on the augmented model, the following equation was estimated:

$$(\log Y_{Tt,I} - \log Y_{0t,I})/n_t = \alpha + \beta_1 \log(Y_{0t,i}) + \beta_2(GC) + \beta_3(OP) + \beta_4(FDI) + \beta_5(INF) + \varepsilon_{t,I} \qquad \text{(ii)}$$

The results for the *conditional* β-convergence are also presented in Table 1. The above exercise entails estimation of the conditional β-convergence wherein developed and developing countries were taken together. This implies that convergence or divergence would include intra-developing country, intra-developed country and developing-developed country effects in a combined manner. However, in studying the issue of global asymmetries, it is important to separate out these individual effects to be able to analyze asymmetries between developing and developed countries. Hence, in the next step we estimate the equation (ii) for developed as well as developing countries separately. The results for these estimations are also presented in Table 1.

Having studied the asymmetries between developed and developing countries, we move on further to study the extent to which different regional

trading blocs have been successful in achieving growth convergence/ divergence in their respective integrated regions, especially with respect to trade integration.

In order to bring out the role of trade openness in the global context and regional integration context in the recent decades, in the sixth step we study the asymmetry issue for six prominent regional trading blocs, viz., EU-15, NAFTA, Mercosur, SAARC and SADC including both developed world groupings and developing world groupings across continents. The following equation was estimated:

$$(\log Y_{Tt,I} - \log Y_{0t,I})/n_t = \alpha + \beta_1 \log(Y_{0t,i}) + \beta(GC) + \beta_3(OP) + \beta_4(FDI) + \beta_5(INF) + \beta_6(EXP) + \varepsilon_{t,I} \qquad \text{(iii)}$$

Here, EXP is taken as a proxy for the depth of regional trade integration measured by intra-regional trade as a percentage of each regional grouping's total world trade. Since most of the regional economic groupings of the sample are primarily a freer trade zone, this variable is expected to capture whether the presence of high or low intra-regional trade alters the growth convergence/divergence estimates. The results are presented in Table 2.

For the two variables, OP and EXP, a *redundant variable test* was conducted to test whether they have been important in influencing the GDP growth rate. This test is for whether a subset of variables in an equation all have zero coefficients and might thus be deleted from the equation. This aspect is captured by the F-statistic and the Log likelihood ratio under the redundant variable test.

Furthermore, the estimated equation (iii) differs from the earlier models in one major respect. Given the fact that all the regional groupings under consideration witnessed either formation or deepening of trade integration in the decade of the 1990s we undertook the estimation by pooling the time series data of various variables with the cross-section (i.e. each country), specific to a particular regional grouping. This posed the methodological problem of handling the stationarity issues in the pooled dataset. Thus, we took recourse to the advancement in the

literature in terms of treatment of the time series nature of data in a pooled framework.

In this regard, techniques relating to testing for unit roots in panel data were applied in their most sophisticated forms so as to make our estimates, pertaining to the implications of regional integration for growth convergence/divergence, more robust and reliable. The rationale for such an exercise and its methodology are presented briefly below.

The primary motivation behind the application of panel data unit root tests, as opposed to standard univariate unit root tests, is to exploit the extra information provided by pooled cross-section time series data in order to get more powerful procedures. It has been noticed that the unit root test for a single time series, such as the Augmented Dickey-Fuller (ADF) test has low power in the sense that it has often the tendency to overly reject the stationarity hypothesis of a time series. During the last decade several such methods were developed. The panel data unit root tests that have been performed in this paper are Levin and Lin (1993); Im, Pesaran and Shin (1997); and Hadri (2000, 2004). As it would be clear, they have been applied to make the estimates more powerful in a sequential manner.

Levin-Lin-Chu Test

Levin, Lin, and Chu (LLC) test assumes that there is a common unit root process such that it is identical across cross-sections. The LLC considers the following basic ADF specification:

$$\Delta y_{it} = \alpha\, y_{i\,t-1} \sum_{j=1}^{pi} \beta_{ij} \Delta\, y_{i\,t-j} + \varepsilon_{it} \qquad (1)$$

where i and t stand for cross section (i.e. country) and time, respectively; y_{it} is the time series variable for all countries that is being tested for stationarity. Δ is a first difference operator; and ε is the error term. Here, we assume a common $\alpha = \rho - 1$, but allow the lag order for the difference terms, p_i , to vary across cross-sections. The null (H_0) and alternative (H_1) hypotheses for the tests are:

$$H_0: \alpha = 0$$
$$H_1: \alpha < 1$$

As per the test, under the null and alternative hypotheses there is presence of a unit root and there is absence of a unit root, respectively. The LLC test shows that under the null hypothesis a modified t-statistic for the resulting $\hat{\alpha}$ is asymptotically normally distributed:

$$t^* = \frac{t_\alpha - (NT)\, S_N\, \hat{\sigma}^2\, se(\hat{\sigma})\, \mu_{MT^*}}{\sigma_{MT^*}} \rightarrow N(0,1)$$

where t_α is the standard t-statistic for $\hat{\alpha} = 0$, $\sigma^{\hat{2}}$ is the estimated variance of the error term , $se(\hat{\sigma})$ is the standard error of $\hat{\alpha}$, and T = no. of time periods – $(\Sigma p_i / N) - 1$.

The remaining terms, which involve complicated moment calculations, are described in greater detail in LLC. The average standard deviation ratio, S_N, is defined as the mean of the ratios of the long-run standard deviation to the innovation standard deviation for each individual. Its estimate is derived using kernel-based techniques. The remaining two terms, μ_{MT^*} and σ_{MT^*} are adjustment terms for the mean and standard deviation.

The major weakness of the LLC test lies in its implicit assumption that all individual AR(1) series have a common autocorrelation coefficient. Consequently, under $H_{0,LLC}$ each series has a unit root while under $H_{1,LLC}$ each of them is stationary. Thus, the alternative hypothesis becomes too restrictive for practical purposes. The Im-Pesaran-Shin (IPS) Test relaxes this assumption by assuming under the alternative hypothesis that at least one, but not necessarily all of the series is stationary.

Im-Pesaran-Shin Test

Under the IPS test, a separate ADF regression for each cross section is specified:

$$\Delta y_{it} = \alpha\, y_{i\,t-1} \sum_{j=1}^{pi} \beta_{ij} \Delta\, y_{i\,t-j} + \varepsilon_{it} \qquad (2)$$

The null hypothesis is written as

$$H_0: \alpha_i = 0, \text{ for all } i$$

while the alternative hypothesis is given by:

$$H_1: \alpha_i = 0, \text{ for } i = 1,2,3\ldots..N_1$$

$$\text{or, } \alpha_I < 0, \text{ for } i = N+1, N+2,\ldots..,N$$

Let t_i denote the "t-statistic" for α_i . The test statistic as calculated by Im, Pesaran and Shin is given by:

$$Z = \sqrt{N}\,(t - E(t)) \,/\, \sqrt{Var(t)}$$

where, $t = (1/N)\,\Sigma^N t_i$: E(t) and Var(t) are the mean and variance, respectively.

The earlier two viz. LLC and IPS tests described above test the null hypothesis of a unit root against the alternative of at least one stationary series, by using ADF statistic across the cross sectional units of the panel. By contrast, in a major advancement, Hadri (2000) proposed a Lagrange multiplier (LM) procedure to test the null hypothesis that all of the individual series are stationary against the alternative of at least a single unit root in the panel.

Hadri Test

The Hadri panel unit root test is similar to the KPSS unit root test. Like the KPSS test, the Hadri test is based on the residuals from the individual OLS regressions of $y_{i\,t}$ on a constant, or on a constant and a trend. A critical assumption underlying this test is that of cross section independence among the individual time series in the panel. The IPS test exhibits severe size distortions in the presence of cross sectional dependence. Hence, in this regard Hadri's test is an improvement over the earlier tests. The panel data model under Hadri's test procedure has been specified by the following model:

$$y_{i\,t} = \alpha_i + \delta_i t + \varepsilon_{it} \qquad (3)$$

where, y_{it} is an observation for cross section I at time t. $\{\alpha_i , \delta_i\}$ is an intercept and a time trend, respectively, that are specific to cross section i. Given the residuals $\varepsilon\hat{}$ from the individual regressions, the LM statistic (assuming homoskedasticity across cross sections) is given by:

$$LM_1 = 1/N\,(\Sigma_{i=1}^{N}(S_i(t)^2/T^2)\,/\,f_0)$$

where $S_i(t)$ are the cumulative sums of the residuals,or in other words,

$$S_i(t) = \Sigma\varepsilon\hat{}_{i\,t}$$

And f_0 is the average of the individual estimators of the residual spectrum at frequency zero:

$$f_0 = \Sigma_{i=1}^{N} f_{i0}/N$$

More importantly, an alternative form of the LM statistic allows for heteroskedasticity across *i* :

$$LM_1 = 1/N\,(\Sigma_{i=1}^{N}(S_i(t)^2/T^2)\,/\,f_{io})$$

Hadri shows that under mild assumptions, the panel data test statistic is given by:

$$Z = \sqrt{N}\,(LMi - \xi)/\zeta \;\rightarrow\; N(0,1) \text{ , for } i = 1 \text{ and } 2$$

where, $\xi = 1/6$ and $\zeta = 1/45$, if the model only includes constants (δ_i is set to 0 for all *i*), and $\xi = 1/15$ and $\zeta = 11/6300$, otherwise. Thus, LMi and the LM statistic (as mentioned earlier) are with the homoskedasticity and heteroskedasticity assumption, respectively.

Although the panel variant of the KPSS tests developed by Hadri for the null of stationarity is an improvement over the earlier tests developed, it suffers from size distortions in the presence of cross section dependence under certain conditions (Monica Giulietti et al. 2005). We have left this aspect for future research as it takes us away from the main focus of the paper.

Against this backdrop, six steps of growth asymmetries, including their relationship with primarily regional trade integration have been explored and estimated and the empirical observations are analyzed in the sections that follow.

IV. Results

Growth asymmetries among the developing countries

A comparison is made of the average annual growth of real per capita GDP (constant 2000 US $) between 1980s and 1990s for 153 developing countries. It is observed that only around 62 developing countries have experienced a higher growth rate during this period. Rest of the countries has either experienced a stagnant progress or their average growth has declined in the 1990s (Chart 2).

Growth asymmetries between developed and developing countries

Having observed that in the recent decades countries belonging to the developing world have displayed divergent growth profiles with respect to real GDP per capita, an attempt has been made to examine the nature of growth asymmetries between developing and developed worlds. It is discernible from Chart 3 that some of the prominent developed countries as well as developing countries have experienced diametrically opposite trends in their economic growth. From the total of 22 OECD countries about 10 of them (i.e. 45% of total OECD countries) witnessed a positive economic growth in the period concerned. Negative or stagnant growth was observed in 12 OECD countries during the same period. While in the

CHART 2: Disparities in Growth Rate of Roal Capita GDP within Developing World between 1980s and 1990s

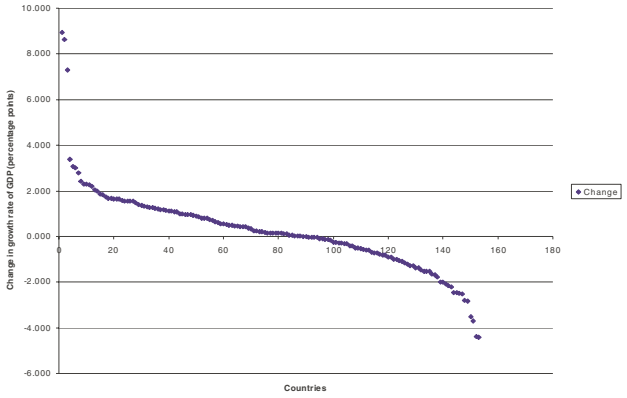
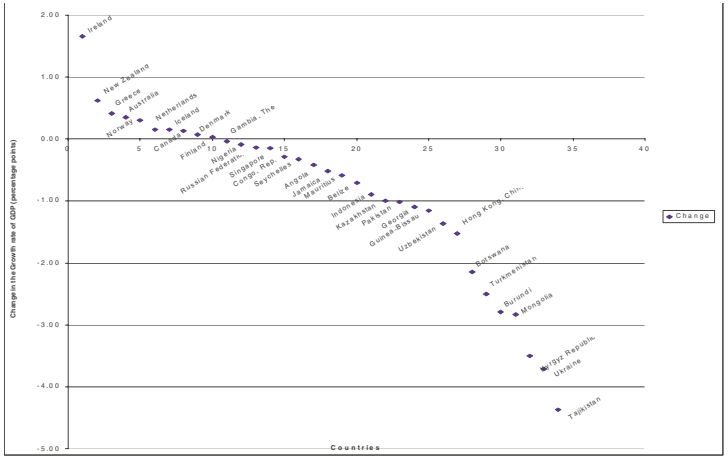


CHART 3: Disparities in Real Per Cap GDP between Developed and Developing Countries between 1980s and 1990s: Some Illustrations



Source: Authors' own calculations

case of developing countries, as observed in the previous section, 62 countries (i.e. 40% of total developing countries) observed a positive growth around, almost 91 developing countries (i.e. 60%) have either witnessed zero or negative growth rate change during the period under consideration. This clearly reveals the fact that there are global asymmetries in terms of the growth processes, skewed against the countries of the developing world, if one goes by the sheer number of countries.

The growth asymmetries of this nature need to be explored with the help of tools that are more robust and powerful in an econometric sense. Thus, the observations made with regard to global asymmetries in the contexts of intra-developing countries and between developing and developed countries' groups are examined further with the help of β-convergence techniques in the subsequent sections.

Unconditional β-convergence for developed and developing countries together

The results of equation (i) presented in Table 1 show that the sign of β is positive and significant, implying that over time countries have not

converged in terms of their real per capita GDP. The rate of divergence[2] is around 0.21% and statistically significant. However, since the explanatory power of this basic model is very low (i.e. 3%), therefore there is a need to augment the model with additional variables as explained in Section III.

Conditional β-convergence for developed and developing countries together

In this step, we have used the Random Effects estimation technique, although the Hausman test statistic shows that the Fixed Effects estimation is better. Our choice of the random effects technique of estimation is based on the economic logic that needs serious consideration while estimating β-convergence with respect to real GDP per capita across countries and that too over a fairly long time-period.

Under the panel data, the constant term captures the unobserved heterogeneity or the cross-section specific effects. The Fixed Effects model assumes a different but fixed constant term for each cross section (here, country), which is correlated with the other observable explanatory variables in the model, while the Random Effects model assumes that the unobserved individual heterogeneity is uncorrelated with the other observable explanatory variables. Since we are considering a long period of 30 years, there is little reason to believe that individual country specific characteristics affecting the growth rate of per capita income are constant and fixed, as assumed away in the Fixed Effects model. According to the economic rationale, such effects need to take cognizance of the fact that they have a random component, which may not be correlated to the other observable explanatory variables. Hence, estimating the model using the Random Effect estimation technique seems to be more appropriate on the basis of economic logic.

The results of the augmented equation (ii) are presented in Table 1. Beta coefficient is positive and significant, implying that over time countries have not converged in terms of their real per capita GDP. The rate of divergence is 0.26%. All variables are highly statistically significant. In addition, the explanatory power of the model has improved considerably (Adjusted $R^2 = 0.45$). However, in this formulation, convergence or

Table 1: Panel Data Regression results for Unconditional and Conditional Convergence: All countries and separately for Developed and Developing countries

Variable	Unconditional Convergence	Conditional Convergence		
	All Countries (RE)	All Countries (RE)	Developed (RE)	Developed (RE)
Constant	-0.001339 (-0.536943)	-0.001514 (-0.584590)	0.043125 (3.364839)	0.006741 (1.509807)
Initial Per Cap GDP	0.002058 (2.696995)	0.002502@ (3.131229)	-0.005850 *** (-1.795094)	-0.000570 (-0.381328)
FDI		-0.000144 (1.045007)	4.39E-05 (0.273780)	0.000289*** (1.689990)
Govt. Consumption	-	-0.000298@ (-2.990757)	-0.000690@ (-4.158073)	-0.000355@ (-2.741769)
Openness	-	9.23E-05@ (3.102360)	0.000116@ (2.365143)	0.000107@ (2.703885)
Inflation	-	-8.14E-06@ (-4.733603)	-9.87E-05# (-1.299989)	-6.83E-06@ (-3.829924)
R^2	0.039203	0.161676	0.582525	0.420405
Adjusted R^2	0.036882	0.151453	0.557069	0.411405
Durbin-Watson Statistic	1.747968	1.729821	2.578985	2.645122

Notes: (i) RE= Random Effects, (ii) Figures in parentheses are t-values, (iii) @99.5% Level of Significance, * 99% Level of Significance, **97.5% Level of Significance, *** 95% Level of Significance and # 90% Level of Significance.

divergence includes intra-developing country, intra-developed country and developing-developed country effects in a combined manner. Thus, the need to undertake the estimation for the developing and developed countries' groups separately.

Conditional β-Convergence for Developed and Developing Countries Separately

The results of equation (iii) are presented in Table 1. The results are opposite to the previous models. β coefficient is negative, implying that the countries of both the sample are converging within the group with respect to real GDP per capita. However, the beta is not significant in the case of developing countries but significant for developed countries.

This brings to an interesting juncture of our analysis. The positive implication of these results is that both developing and developed worlds are moving towards growth convergence when the equations are estimated separately. The negative connotation is that the coefficient of convergence in the case developing country-group is not statistically significant.

But the most striking negative implication is that when all countries are considered together, we witness a significant trend of growth divergence. If we take the results of the three scenarios together viz. all countries, developed countries group and developing countries group with divergence, convergence and convergence, respectively, it implies that the growth asymmetries are on the rise between the developed and developing worlds. Thus, our observations made from the two charts presented earlier that global asymmetries are on the rise, get confirmed in a more robust way. This is significant in the sense that the issue of global growth asymmetries still remains as a policy challenge and both national and global policies are required to keep addressing them.

Conditional β-Convergence for Prominent Regional Groupings Separately

For the reasons explained earlier, an attempt has been made to explore the relevance of primarily trade integration at the regional level in influencing the growth convergence/divergence among countries. The results when

equation (iii) is estimated for the different regional groupings are presented in Table 2. The beta coefficient for all grouping is negative indicating regional convergence. However, one worrying results is the unexpected signs of trade openness in the case of a few regional groupings. Such a result is difficult to explain unless there is substantial evidence to suggest that import liberalization has necessarily constrained GDP growth in these groupings as explained in Sen and Das (1992), as a theoretical possibility. The negative sign of the FDI in the cases of Mercosur, SAARC and SADC does not pose any problem of interpretation as it is quite consistent with the existing literature on the subject, according to which FDI-growth linkages are not clear (Kumar, 1991; Marksun and Venables, 1997; Agosin and Mayer, 2000, among others).

Thus, to correct for the above mentioned problem of interpretation we extended the analysis and we included intra-regional exports as a proportion to total world trade of the grouping as a measure of the depth of regional integration and the results are presented in Table 3. The rate of convergence for all regions is quite high for the period concerned. It is around 7% for regions like EU, NAFTA, ASEAN, MERCOSUR and SADC and around 12% for SAARC. Implications of other variables are similar to the ones provided in the case of the previous table.

The explanatory power of the independent variables included is also very high for almost all the regressions. The Durbin Watson statistic also shows that there is no problem of autocorrelation. The Wald test shows that all coefficients of the additional variables in the model are jointly significant in explaining the convergence within the regional trading blocs.

The coefficient of trade openness (OP) with respect to world (i.e. import-to-GDP ratio) turns positive for all groups in consonance with the economic intuition. Also, the intra-regional trade as a percentage of total exports to world (as a measure of regional trade integration i.e. EXP) has a positive and significant coefficient for the more integrated groupings like EU, NAFTA, Mercosur and ASEAN, however, it is negative for relatively lesser-integrated groupings like SAARC and SADC.

Table 2: Panel Data Regression Results for Conditional Convergence for Different Regional Economic Groupings (Fixed Effects)

Variable	EU-15	NAFTA	ASEAN	MERCOSUR	SAARC	SADC
Initial Per	-0.004	-0.01 @	-0.04 @	-0.02 *	0.03**	0.0003
Cap GDP	(-0.58)	(-2.63)	(-2.63)	(-2.51)	(2.09)	(0.07)
FDI	4.32E-05	0.004***	0.006**	-0.0003	-0.02#	-0.0005
	(0.26)	(2.22)	(1.98)	(-0.12)	(-1.27)	(-1.11)
Govt.	-0.0005*	0.0003	-0.001	-0.0003	-0.002**	-2.42E-05
Consumption	(-2.49)	(0.96)	(-0.96)	(-0.51)	(-1.81)	(- 0.06)
Trade	7.00E-05***	-0.0004*	-0.0001	-0.0005*	0.0008*	0.0002@
Openness	(1.56)	(-2.32)	(-0.48)	(-2.37)	(2.25)	(2.79)
Inflation	-0.0003***	-0.0003@	-0.001**	-5.27E-06	-0.002#	-0.0002#
	(-1.73)	(-4.36)	(-2.09)	(-0.85)	(-1.58)	(-1.48)
R^2	0.31802	0.79505	0.61659	0.48735	0.41764	0.27333
Adjusted R^2	0.249822	0.624266	0.424896	0.231029	0.255869	0.166472
Durbin-Watson Statistic	2.094563	2.640758	2.226182	2.958406	1.914701	1.374469

Note: @99.5% Level of Significance, * 99% Level of Significance, **97.5% Level of Significance, *** 95% Level of Significance, # 90% Level of Significance

Table 3: Panel Data Regression Results for Conditional Convergence for Different Regional Economic Groupings (Fixed Effects)

Variable	EU-15	NAFTA	ASEAN	MERCOSUR	SAARC	SADC
Initial Per	-2.673147@	-4.99*	-7.440070@	-7.383730@	-2.649437#	-4.053724
Cap GDP	(-5.803)	(-2.392)	(-5.785)	(-2.61)	(-1.522)	(-1.012)
FDI	0.0092*	0.0124	-0.013774	-0.007713	0.151979	0.001983
	(2.361)	(0.4136)	(-0.3749)	(-0.1513)	(1.233)	(0.0307)
Govt.	-0.0961@	-0.1391@	-0.0994#	-0.0583#	0.0091	-0.01157
Consum-ption	(-5.888433)	(-3.675862)	(-1.605896)	(-1.427832)	(0.132478)	(0.324602)
Trade	0.0159@	0.0177#	0.0195**	0.0209	0.0097	0.0094
Openness	(3.286657)	(1.441796)	(1.973965)	(1.075854)	(0.349963)	(0.526162)
Inflation	-0.0338@	-0.0313@	-0.0472@	-0.0002**	-0.0612@	0.0062#
	(-6.0267)	(-3.3421)	(-7.0436)	(-2.1554)	(-3.2241)	(1.4878)
Regional Trade Integration ##	0.0049@	0.00055#	0.0501**	0.0204**	-0.0257***	-0.0177
	(2.5842)	(1.3820)	(2.2984)	(2.2167)	(-1.8438)	(-0.8432)
R^2	0.608129	0.387068	0.701042	0.370187	0.615116	0.108441
Adjusted R^2	0.564855	0.238479	0.642551	0.246963	0.482397	-0.042671
Durbin-Watson Statistic	1.167292	2.143394	1.400654	1.737550	2.365883	2.084743
WALD	144.6812	16.89538	59.67342	13.33240	18.70952	2.925624
F-statistic	19.82181	1.308448	12.37510	3.751509	4.530286	0.935397
Log likelihood ratio	56.60591	3.205128	33.13563	12.25646	15.37375	3.252625

Note: @99.5% Level of Significance, * 99% Level of Significance, **97.5% Level of Significance, *** 95% Level of Significance, # 90% Level of Significance

For these two variables, OP and EXP, a *redundant variable test* was conducted to test whether they have been important in influencing the GDP growth rate. This test is for whether a subset of variables in an equation all have zero coefficients and might thus be deleted from the equation. This is captured through the test statistic like the F-statistic and the Log likelihood ratio. Both F-Statistic and LR Statistic are quite high enough to reject the Null hypothesis of zero coefficients of these additional variables thus, implying that trade openness in both global and regional contexts have influenced the results on convergence in a statistically significant manner. However, the F-statistic is quite low for SADC, implying that trade integration has not contributed much to its growth convergence; quite expectedly as experience of regional trade integration in SADC so far has remined limited. Overall, results imply that both trade openness and regional trade inegration have been important factors in influencing growth convergence in the regional groupings.

Tests of Stationarity

As highlighted earlier, due to the fact that mostly the prominent regional groupings across continents witnessed an increasing tendency towards deeper regional trade integration in the 1990s, we had to consider a continuous time-series and cross-country dynamic panel data set for any meaningful estimations of the role of regional trade integration in the context of addressing growth asymmetries in a particular regional grouping. This posed the problem of handling the issue of stationarity in the pooled data framework. Unless the unit root tests are conducted the interpretation of results would remain deficient. We addressed this problem by applying different tests with increasing power of our estimates' robustness. The LLC, IPS and Hadri tests were undertaken and their values are presented in Table 4, 5 and 6, respectively. As evident from the tests there are non-stationarity problems for different variables differently under different tests as well as regional groupings. All what emerges is that the problem is not uniform for all the variables under each test and for each regional grouping.

This helps us in concluding that the broad results of our paper need to be interpreted with caution due to the presence of non-stationarity, though the problem is not uniform across variables, across tests and across regional groupings.

Table 4: Levin-Lin-Chu Test results for all the Time Series variables in all the regional groupings

	Levin-Lin-Chu Test (LLC)						
Series ⟶	EXP	FDI	GC	INF	LOGD	LOGIN	OP
Regional Groups ↓							
EU-15	NUR	NUR	NUR	NUR	NUR	UR	UR
NAFTA	UR	UR	UR	NUR	NUR	UR	UR
ASEAN	NUR	UR	UR	NUR	NUR	NUR	NUR
Mercosur	UR	UR	UR	UR	UR	UR	NUR
SAFTA	UR	NUR	NUR	NUR	NUR	NUR	NUR
SADC	UR	NUR	NUR	UR	NUR	UR	UR

Note: UR means presence of UNIT ROOT, NUR means NO UNIT ROOT, EXP is intra-regional trade series, FDI is Foreign Direct Investment, GC is Government Consumption, INF if inflation, LOGD is the growth rate of per capita GDP, LOGIN is the initial per cap GDP, OP is openness.

Table 5: Im-Pesaran-Shin Test results for all the Time Series variables in all the regional groupings

	Im-Pesaran-Shin Test (IPS)						
Series ⟶	EXP	FDI	GC	INF	LOGD	LOGIN	OP
Regional Groups ↓							
EU-15	UR	UR	UR	NUR	NUR	UR	UR
NAFTA	UR	UR	UR	NUR	NUR	UR	UR
ASEAN	UR	UR	UR	NUR	NUR	UR	UR
Mercosur	UR	UR	UR	UR	UR	UR	UR
SAFTA	UR	NUR	UR	UR	NUR	UR	UR
SADC	UR	NUR	NUR	UR	NUR	UR	UR

Note: UR means presence of UNIT ROOT, NUR means NO UNIT ROOT, EXP is intra-regional trade series, FDI is Foreign Direct Investment, GC is Government Consumption, INF if inflation, LOGD is the growth rate of per capita GDP, LOGIN is the initial per cap GDP, OP is openness.

Table 6: Hadri Test results for all the Time Series variables in all the regional groupings

	Hadri Test						
Series ⟶	EXP	FDI	GC	INF	LOGD	LOGIN	OP
Regional Groups ↓							
EU-15	UR	UR	UR	UR	NUR	UR	UR
NAFTA	UR	NUR	UR	NUR	NUR	UR	UR
ASEAN	UR	UR	UR	NUR	NUR	UR	UR
Mercosur	NUR	UR	UR	UR	UR	UR	UR
SAFTA	UR	NUR	UR	UR	NUR	UR	UR
SADC	UR	UR	NUR	UR	UR	UR	UR

Note: UR means presence of UNIT ROOT, NUR means NO UNIT ROOT, EXP is intra-regional trade series, FDI is Foreign Direct Investment, GC is Government Consumption, INF if inflation, LOGD is the growth rate of per capita GDP, LOGIN is the initial per cap GDP, OP is openness.

V. Concluding Remarks

From the foregoing analysis the main conclusions of the paper are summarized. In the past decades, the globalization process has important policy reforms entailing trade openness, greater emphasis on foreign direct investment, stabilization policies, redefining the role of the state, among others. However, different countries have experienced different growth trajectories over a long period. This has led to global asymmetries in achieving economic growth. Recently, inter-country growth asymmetries have become extremely important since it has been observed that when considering income inequality among all the people in the world, about 70 per cent is explained by differences in incomes between countries and merely 30 per cent by inequality within a country. Neither the growth models nor the empirical explorations provide a clear answer to the issue of global asymmetries.

The problem gets magnified when global growth asymmetries are analysed with the help of real GDP per capita, which is considered as a catch-all proxy for standard of living in an economy. In terms of average annual growth of real per capita GDP (constant 2000 US $), out of 153 developing countries only 62 developing countries have experienced a higher growth rate between

1980s and 1990s. Rest of the countries has either remained stagnant or their average growth has declined in the 1990s. From the total of 22 OECD countries about 10 of them (i.e. 45% of total OECD countries) witnessed a positive economic growth in the period concerned.

The above two read together indicate the nature and extent of global growth disparities between the developed and developing worlds. Tests of Beta-convergence under different model specifications suggest that over time countries have not converged in terms of their real per capita GDP. It is important to note that developed countries as a whole have been experiencing higher and statistically significant real GDP per capita growth than the developing country-group. This is quite significant considering that even such small differences in growth rates, if cumulated over a long period of time, can have decisive influence on the standard of living of people, as measured by real GDP per capita.

The positive and statistically significant variables like initial real per capita GDP, import openness and FDI inflows do suggest that a higher level of income coupled with policies in favour of import openness and FDI inflows can provide an impetus to the economic growth process. This result needs to be viewed in a country-specific context, however, without dismissing their importance for economic growth.

The negative and statistically significant coefficients of government consumption and inflation imply that in the policy-making domain, government's role as a facilitator needs to be recognized to the extent possible and inflation needs to be checked within reasonable limits for achieving economic growth. Nevertheless, here too, the usual caveat of taking country-specific context into account, applies.

We find that it can be concluded that regional integration leads to growth convergence and both openness to global trade and regional openness captured by intra-regional exports are important in this regard. A policy inference that can be drawn from these results is that at the global level 'economic cooperation for economic growth convergence' needs to be flagged and appropriate institutional mechanisms created to intensify the processes of trade and FDI integration. Broadly, the results are in consonance with the predictions of the New Growth Theories.

In the end it may be highlighted that the broad results of our paper need to be interpreted with caution due to the presence of non-stationarity, though the problem is not uniform across variables, across tests and across regional groupings.

Notes & References

[1] excluding oil-exporting countries and those belonging to the erstwhile Soviet Union.

[2] The rate of convergence has been computed as $\lambda = - [1- \exp (\beta T)]/T$ where β is the coefficient corresponding to initial GDP per capita and T is the sub period length.

References

Agosin, MR, and Ricardo Mayer (2000) 'Foreign Investment in Developing Countries: Does it Crowd in Domestic Investment?' *UNCTAD Discussion Paper*, No.146, Geneva: UNCTAD.

Barro, R.J. and Sala-I-Martin, X. (1992), "Convergence". *Journal of Political Economy*, Vol 100, pp. 223-251

Baumol, W.J. (1986), "Productivity Growth, Convergence, and Welfare: What the Long Run Data Show". *American Economic Review*, Vol. 76, (5), pp. 1072-1085.

Berthelon, M, (2004), "Growth Effects Of Regional Integration Agreements", *Central Bank of Chile Working Papers*, 278, December.

Bhagwati, Jagdish and Arvind Panagariya (1996), "The Theory of Preferential trade Agreements: Historical Evolution and Current Trends", *American Economic Review*, Vol.86, No.2, pp.82-87.

Bourguignon, François and Morrisson, Christian 2002, "Inequality among World Citizens: 1820-1992," DELTA Working Paper, Paris

Cappelen, A. & Fagerberg, J. & Verspagen, B., (2001). "The Impact of Regional Support on Growth and Convergence in the European Union," *ECIS Working Papers* 01.14, Eindhoven Centre for Innovation Studies, Eindhoven University of Technology.

Crawford,Jo-Ann and Fiorentino,Roberto.V, " Changing Landscape of Regional Trade Agreements" Discussion Paper No. 8, WTO, Geneva.

Das, Ram Upendra (2004), "Industrial Restructuring and Export Competitiveness of the Textiles and Clothing Sector in SAARC in the context of MFA phase out", *RIS Discussion Paper* No. 85, New Delhi

Dubey, Muchkund (1998), "New Regionalism and Countries of South", Paper presented at a Seminar in RIS, New Delhi, Jan. 31.

Fagerberg, J. and Verspagen, B. (1996), "Heading for Divergence? Regional Growth in Europe Reconsidered", *Journal of Common Market Studies*, Vol. 34, pp. 431-448

Hadri, K. (2000), 'Testing for Stationarity in Heterogeneous Panel Data' *Econometrics Journal*, 3:148-161.

Hadri, K. (2004), "Testing for Stationarity in Heterogeneous Panel Data with Serially Correlated Errors" Manuscript, University of Liverpool.

Halvorsen, R. and Palmquist, R (1980). "The Interpretation of Dummy Variables in. Semilogarithmic Equations" *American Economic Review*, vol. 70, pp. 474-475.

ILO, (2002), "Facing the ageing gap: New-age solutions to old age problems", *Second World Assembly on Ageing* (Madrid, 8-12 April).

Im, K., Pesaran, M., and Shin, Y. (1997). 'Testing for Unit Roots in Heterogenous Panels', mimeo.

Ivaschenko, Alexei, (2002), "Growth and Inequality: Evidence from Transitional Economies", *Pro-poor Growth and Inequality Series 2002*, (http://www.worldbank.org).

Kelegama, Saman and I. N. Mukerjhi (2006) "Indo-Lanka Bilateral Free Trade Agreement: Six Year Performance and Beyond", RIS (forthcoming).

Krugman, P. (1993): "Regionalism versus Multilateralism: Analytical Notes" in Jaime de Melo and Aravind Panagariya (eds.) *New Dimensions in Regional Integration*, Cambridge University Press, Cambridge.

Kumar, Nagesh (2005), "Prosper thy neighbour in South Asia", *The Financial Express*, 15th November, 2005, (http://fecolumnists.expressindia.com/full_column.php?content_id=82602)

Kumar, Nagesh (1998), "Multinational Enterprises, Regional Economic Integration, and Export-Platform Production in the Host Countries: An Empirical Analysis for the US and Japanese Corporations", *Weltwirtschaftliches Archiv*, 134(3), pp. 450-483.

Kumar, Nagesh and Jaya Prakash Pradhan (2002), "Foreign Direct Investment, Externalities and Economic Growth in Developing Countries: Some Empirical Explorations and Implications for WTO Negotiations on Investment", *RIS Discussion Paper* # 27. New Delhi: RIS

Kumar, Nagesh (1991), 'Mode of Rivalry and Comparative Behaviour of Multinational and Local Enterprises: The Case of Indian Manufacturing', *Journal of Development Economics*, 35: 381-392

Levin, A. and Lin, C.-F. (1992). 'Unit Root Tests in Panel Data: Asymptotic and Finite Sample Properties' *Discussion paper #92-93*, University of California, San Diego.

Lucas, Robert (1988), "On the Mechanics of Economic Development", *Journal of Monetary Economics*, 22: 3–42

Marksun, JR, and Anthony J. Venables (1997) Foreign Direct Investment as A Catalyst For Industrial Development, *NBER Working Paper* No.624, Cambridge, Mass.

Martin (1997), "Can Regional Policies Affect Growth and Geography in Europe?" *World Economy*

Martin, P. and Ottaviano, G., (1996) "Growth and Agglomeration," *Working Papers* 1996-14, CEPII Research Center

Milanovic, Branko, 2006. "Global income inequality: what it is and why it matters," *Policy Research Working Paper Series* 3865, The World Bank.

Nancy Birdsall, 2006. "Stormy Days on an Open Field: Asymmetries in the Global Economy," *Working Papers* 81, Center for Global Development.

Panchamukhi V. R. and Ram Upendra Das (2001), "Conceptual and Policy Issues in Rules of Origin", *South Asia Economic Journal*, Vol. 2, No. 2, July-December, Sage Publications

Pomfret, Richard (1988), "Unequal Trade: The Economics of Discriminatory International Trade Policies", Basil Blackwell, New York.

RIS (2002), *South Asia Development and Cooperation Report 2001/02*, New Delhi

Rodriguez, F., and Rodrik, D., (1999), *Trade Policy and Economic Growth: A Skeptic's*

Guide to the Cross-National Evidence, Working Paper 7081, NBER, Cambridge.
Rodrik, D., (2001), "Trading in Illusions", *RIS Digest*, Vol. 18, No. 1-3, December, Research and Information System for the Non-Aligned and Other Developing Countries, New Delhi.
Romer, Paul M. (1986), "Increasing Returns and Long-run Growth," *Journal of Political Economy*, University of Chicago Press, vol. 94(5), pages 1002-37
Sachs, J., and Warner, Andrew M., (1995), "Economic Reform and the Process of Global Integration", *Brookings Papers on Economic Activity no. 1.*
Sala-i-Martin, X.X. (1996), "Regional Cohesion: Evidence and Theories of Regional Growth and Convergence" *European Economic Review*, Vol. 40.
Sala-I-Martin, X. (1994), "Cross-sectional regressions and the empirics of economic growth", *European Economic Review.*
Scott, A. J. (1998), *Regions and the world economy : the coming shape of globa lproduction, competition, and political order*. Oxford: Oxford University Press.
Sen, Sunanda and Ram Upendra Das (1992),"Import Liberalisation as a Tool of Economic Policy in India since MidEighties", *Economic and Political Weekly*, Vol. XXVII, No. 12, March 21, pp. 585594.
Shams, R. (2001), *Regional Integration in Developing Countries: Some Lessons Based on Case Studies*, HWWA Discussion Paper 251, Hamburg Institute of International Economics, Hamburg.
Solow, R.M. (1956), "A contribution to the theory of economic growth." *Quarterly Journal of Economics*, Vol. 70
Tsagkanos, Athanasios .G, Botsaris Charalampos A. and Koumanakos, Evangelos Pet (2006)**,** "Exploring Trends of Per-Capita GDP among EU-15 Members", International Research Journal of Finance and Economics (http://www.eurojournals.com/finance.htm)
UN, (2006), *World Economic and Social Survey*
Urata, Shujiro (2002), "Globalization and Growth in Free Trade Agreements", *Asia-Pacific Review*, Vol. 9, No.1, pp. 20-32.
Viner, Jacob (1950), *"The Customs Union Issue"*, Carnegie Endowment for International Peace, New York
WTO (2003), *World Trade Report*, Geneva
WTO (2006), "Regional Trade Agreements Notified to the GATT/WTO and in Force", as of 15 June 2006 (Table in excel format available from www.wto.org)

RIS Discussion Papers

Available at http://www.ris.org.in/risdiscussion_papers.html

DP#115-2006 *Trade Facilitation and Customs Valuations in India : Identifying the Gaps* by Sachin Chaturvedi
DP#114-2006 *India's Regional Trading Arrangements* by Rajesh Mehta and S. Narayanan
DP#113-2006 *FDI and Spillover Effects in the Indian Pharmaceutical Industry* by Annika Bergman
DP#112-2006 *Regional Cooperation for Asian Energy Security* by Vipul Tuli
DP#111-2006 *Demographic Complementarities and Outsourcing: Implications and Challenges for India* by Mukul G. Asher and Amarendu Nandy
DP#110-2006 *Reinventing UNCTAD: Some Proposals for the UNCTAD Mid-term Review* by Muchkund Dubey
DP#109-2006 *Trade Facilitation Priorities in India and Commitments at WTO: An Overview of Current Trends* by Sachin Chaturvedi
DP#108-2006 *Towards Comprehensive Economic Co-operation between India and Central Asian Republics* by Dr. Ramgopal Agarwala
DP#107-2006 *Monetary and Financial Cooperation in Asia: Emerging Trends and Prospects* by Ramkishen S. Rajan
DP#106-2006 *Japan and an Asian Economic Community* by Masanori Kondo
DP#105-2005 *India-Vietnam Trade:Current Relations and Prospects* by Rajesh Mehta
DP#104-2005 *Trade in IBSA Economic Cooperation: The Role of Transportation Linkages* by Prabir De
DP#103-2005 *Trade and Environment in the WTO: Negotiating Options for Developing Countries* by Sanjay Kumar and Nupur Chowdhury
DP#102-2005 *Prospects for Environmental Trade under the Regional Process in South Asia: Evidence from SAPTA and Proposals for SAFTA* by S. K. Mohanty and Sachin Chaturvedi
DP#101-2005 *Emergence of China and India in the new Millennium: Will it facilitate Market Access for LDCs and Developing Countries?* by S. K. Mohanty and Sachin Chaturvedi
DP#100-2005 *Towards a Broader Asian Community: Agenda for the East Asia Summit* by Nagesh Kumar
DP#99-2005 *Biosafety Protocol, International Trade and Agricultural*

Biotechnology: Policy Inferences for India by Sachin Chaturvedi and Lian Chawii

DP#98-2005 *The WTO Negotiations on Industrial Tariffs: What is at Stake for Developing Countries?* by Yilmaz Akyüz

DP#97-2005 *Non-tariff Barriers Affecting India's Exports* by Rajesh Mehta

DP#96-2005 *Advancing the ASEAN-India Partnership in the New Millennium* by Ong Keng Yong

DP#95-2005 *The Search for Regional Architecture: The Role of ASEAN as Strange Attractor* by Djisman S. Simanjuntak

DP#94-2005 *India-Central Asia Economic Relations: A Report of RIS/CII Seminar*

DP#93-2005 *Asian Energy Outlook to 2020: Trends, Patterns and Imperatives of Regional Cooperation* by Kokichi Ito, Li Zhidong and Ryoichi Komiyama

DP#92-2005 *Regional Trade and Investment Architecture in Asia-Pacific: Emerging Trends and Imperatives* by Tiziana Bonapace

DP#91-2005 *India-East Asia Integration: A Win-Win for Asia* by Mukul G. Asher and Rahul Sen

DP#90-2005 Strategic Relevance of Asian Economic Integration by Eric Teo Chu Cheow

DP#89-2005 *China's Role in the Asian Economic Unification Process* by Yao Chao Cheng

DP#88-2005 *Strategic Approach to Strengthening the International Competitiveness in Knowledge Based Industries: Electronics Industry* by K. J. Joseph

DP#87-2004 *Regional Cooperation for Poverty Alleviation and Food Security in South Asia* by Sachin Chaturvedi

DP#86-2004 *Towards a Free Trade Area in South Asia: Charting A Feasible Course for Trade Liberalisation with Reference to India's Role* by Indra Nath Mukherji

DP#85-2004 *Industrial Restructuring and Export Competitiveness of the Textiles and Clothing Sector in SAARC in the Context of MFA Phase-Out by* Ram Upendra Das

DP#84-2004 *India's Export by Countries and Commodities: On the Estimation of a Forecasting Model Using Panel Data by* Rajesh Mehta and Parul Mathur

DP#83-2004 *Strategic Approach to Strengthening the International Competitiveness in Knowledge Based Industries:Indian Chemical Industry* by Vijay Kumar Kaul

DP#82-2004 *Strategic approach to Strengthening the International Competitiveness in Knowledge Based Industries: The Case of*

Indian Automotive Industry by Neelam Singh

DP#81-2004 *Strategic approach to Strengthening the International Competitiveness in Knowledge Based Industries: Non-electrical Machinery Industry* by M. Padma Suresh

DP#80-2004 *Strategic approach to Strengthening the International Competitiveness in Knowledge Based Industries: The Indian Pharmaceutical industry* by Aradhna Aggarwal

DP#79-2004 *Complementarities and Potentials of Intra-regional Transfers of Investments, Technology and Skills in Asia* by Saikat Sinha Roy

DP#78-2004 *Towards Formation of Close Economic Cooperation among Asian Countries* by S K Mohanty, Sanjib Pohit and Saikat Sinha Roy

DP#77-2004 *Transaction Costs as Barriers to Economic Integration in Asia: An Empirical Exploration* by Prabir De.

DP#76-2004 *Transforming Digital Divide into Digital Dividend: The Role of South-South Cooperation in ICTs* by K J Joseph.

DP#75-2004 *Transport Cooperation in BIMST-EC: Issues and Way Forward* by Prabir De.

DP#74-2004 *WTO Market Access Negotiations and Indian Small Scale Industry* by Rajesh Mehta and Pooja Agarwal.

DP#73-2004 *ASEAN-India Economic Relations: Current Status and Future Prospects* by Rahul Sen, Mukul G. Asher and Ramkishen S. Rajan.

DP#72-2004 *National Innovation Systems and India's IT Capability: Are there any lessons for ASEAN Newcomers*? by Nagesh Kumar and K J Joseph.

DP#71-2004 *Monetary Cooperation in South Asia: Potential and Prospects by* Sweta Chaman Saxena and Mirza Allim Baig

DP# 70-2004 *India-ASEAN Cooperation in Information and Communication Technologies: Issues and Prospects by* K.J. Joseph and Govindan Parayil

DP# 69-2004 *Issue Related to India's Energy Trading with Central Asian Countries* by Barnali Nag.

DP# 68-2004 *Biotechnology in South Asia: Issues, Concerns and Opportunities* by Sachin Chaturvedi.

DP# 67-2004 *Environment Issues in Free Trade Agreements in Asia and the Post-Cancun Challenges: Issues and Policy Options* by Sachin Chaturvedi

DP# 66-2003 *How Do Infrastructure Facilities Affect Regional Income? An Investigation with South Asian Countries* by Prabir De.