ECONOMIC GROWTH AND REGIONAL CONVERGENCE
THE CASE OF PAKISTAN

Mudassar Nazir and Hafiz M. Yasin [1]

Abstract

The questions concerning the prevalence of poverty and the deepening gulf between rich and poor have always been the burning issues all over the world. These issues, irrespective of their causation factors, bear far reaching economic and political consequences. The federation of Pakistan displays complex regional diversities; the component units differ not only in linguistic, cultural, and demographic terms but also in the level of socio-economic development. Although the constitution of Pakistan guaranties equitable shares for all provinces in national resources, the level of growth across regions has not been uniform. During the past half a century, investment in physical and social sectors concentrated in selected parts of the country, particularly in big cities. This practice has led to creation of economic disparities and a number of socio-political problems like terrorism, regional tensions, weakening of the federation and difficulty in consensus on issues of national interest.

Growth theory provides a powerful analytical framework to analyze the issue of regional convergence. Given the assumption of perfect markets, the countries within a geographical region are supposed to converge overtime to a common steady state level of income, provided they are similar in other socio-economic conditions. Put differently, if countries differ significantly in these conditions, then each unit is likely to follow an independent growth path. This is also true for different regions within the same country/ political entity. The objective of this study is to investigate empirically if there is any evidence of convergence across different regions of Pakistan. The study utilizes the conventional analytical tools and time series data over the period 1979-2005 for the four provinces, disaggregated into rural and urban sectors.

As expected, no evidence of absolute convergence could be observed obviously due to presence of vast differences across the provinces in terms of the growth determinants. In contrast, the income disparities across the regions exhibited a widening tendency during the period under reference. However, the data did support conditional convergence, which implies that different regions followed independent growth paths. The findings further indicate that certain socio-economic conditions are crucial to explain the persistence of income disparities. The question as to why the determinants of growth differ so widely across the constituent units of Pakistan inhibiting absolute convergence is often discussed at different economic and political forums. The study concludes with some policy recommendations that may improve the situation.

[1] The authors are working as (i) Research Officer at the Planning Commission, Govt. of Pakistan, Islamabad::<muddasar.mphil49@iiu.edu.pk>, and (ii) Associate Professor at IIIE, International Islamic University Islamabad: <yasin.iiie@gmail.com>

1.0 Introduction

Growth and development are the closely related terms that convey more or less the same message to the general reader. However, where growth theory concentrates on the factors responsible for uplifting the gross and per capita incomes, the theory of development focuses on the overall socioeconomic structure and institutional set-up that move ahead with the passage of time. The growth rate of income is central to the process of economic development. The relationship between growth and development resembles that of an engine and the carriage. Following the impetus of growth in income/ output, the entire social and institutional structure of an economy begins to improve in all directions. If the growth process sustains overtime, the social structure moves gradually towards modernization, democratic attitudes, broadness in outlook along with equity in distribution, reduction in poverty and general improvement in the standard of living. The borders of growth and development get coincide when a researcher considers the question of equity in income distribution across different households and the question of convergence across different regions.

The term 'convergence' has been used in growth literature to imply a narrowing down of the differences in incomes across regions and thereby a tendency towards a common equilibrium over time. Although the concept is quite old[2], the issue came to the surface since the late eighties when the new emerging economies exhibited rapid and sustained growth but the old industrial countries experienced relatively a slowing down. As noted by Abramovitz (1986), it was believed (with a sort of fear) that 'East Asians Countries', which embarked on growth path at a later stage, will catch up with their 'Western' counterparts in the near future. It was argued that innovation is often difficult whereas imitation is easier. Naturally some may be the innovators and leaders in growth, while majority of others may be the imitators and followers. The contrasting arguments were also floated in that the leaders have, after all, an edge over the followers. The evidence, both in favour and against, could now be traced through the vast literature on growth and convergence[3].

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[2] The origin of convergence goes back to mid-18th century and important insights can be found in the scholarly writings of David Hume (1742) and Josiah Tucker (1776): See Bruce Elmslie (1995) for details.

[3] William Baumol (1986) was among the pioneer economists who provided statistical evidence of convergence among some countries and also for its absence among others.

The hypothesis implies equalization of per capita income and productivity overtime across the world economies. In this connection, one has to distinguish between absolute and conditional convergence. The former is interpreted as convergence of different economies to a common steady state level, given identical preferences and technologies. This implies that relatively poor regions (should) grow faster than their richer counterparts despite differences in the start-up points. In contrast, if they exhibit significant differences in structural characteristics, then every region will converge to its specific steady state level rather than to a common equilibrium. This latter behaviour is termed as conditional convergence, since the growth rate of an economy is affected by other features like population growth, nature of technology, political and social characteristics etc. Another important concept often used in the analysis of regional disparities is the dispersion from the steady state (denoted by sigma: σ). If the dispersion or variability of real per capita income across regions decreases with the passage of time (in other words, if they get closer to one another), they are said to exhibit sigma convergence.

The convergence hypothesis has been tested by researchers using different data sources, methodologies and statistical techniques. For large sample of countries (with different socio-economic structures), most of the empirical studies fail to support absolute convergence. Put differently, this kind of behaviour is supported only for smaller ' homogeneous groups' within specific geographic regions. For instance, Barro and Sala-i-Martin (1992), and Mankiw, Romer and Weil (1992) reject absolute convergence for a diverse group of countries in the global context but do not reject its occurrence for regions like OECD countries, where technologies, preferences and other social structures are more or less similar. In general, most of the studies report in favor of conditional convergence.

2.0 Rationale and Objectives of the Study

The questions concerning the prevalence of poverty, the deepening gulf between rich and poor and the rising trend in other economic disparities across regions, sectors and classes, have always been the burning issues all over the world. These issues, irrespective of their causation (structural or policy discrimination), bear far reaching

economic and political consequences. In order to devise appropriate policies for relatively even distribution of the benefits of growth, it is essential to investigate into regional disparities and to understand their causes and impacts. In fact, regional growth is as important for a country as national growth on the grounds of both equity and political harmony. In this connection, the convergence analysis provides an appropriate framework for identification of the nature and causes of disparities. Examples of such attempts are numerous, both for the developed and developing countries[4].

The Federation of Pakistan displays complex regional diversities, i.e. the geographic regions differ not only in linguistic, cultural, and demographic terms but also reflect evident diversities in the level of social and economic development. During the past half a century, investment in physical and social sectors has largely concentrated in selected parts of the country, particularly big cities like Karachi. This practice has led to large scale migration to cities in search of employment, created economic disparities and aggravated the problems of poverty and inequalities. These disparities have in turn led to development of a sense of deprivations among rural population, weakening of the federation, regional tensions, political instability, terrorism and difficulty in building consensus on issues of national interest.

It may be interesting and useful to investigate the existence of convergence in Pakistan, to identify its nature and to pinpoint the various impediments in its way. A number of indicators like literacy rate, population density, life expectancy, degree of urbanization, the rule of law etc; speak of much disparity across the socio-political regions. Further, these disparities are increasing over time. This provides sufficient rationale to focus attention on the issue of growth and convergence using the formal models and standard procedures. For this end, we discuss the methodology and analytical framework in the next section. This is followed by a brief discussion of the available data and then an analysis of the main findings. The final section is reserved for conclusions and policy recommendations as usual.

[4] For instance, Juan-Ramon and Rivera-Batiz (1996) analyzed the issue for the states of Mexico, Cashin & Sahay (1996) and Bajpai & Sachs (1996) for Indian states, Jian, Sachs & Warner (1996) and Gundlach (1997) for Chinese provinces, and Hossain (2000) for various regions of Bangladesh.

3.0 Analytical Framework

It seems appropriate to present a brief historical sketch of the models used for the purpose before we concentrate on empirical analysis.

3.1 Historical Perspective

The neoclassical growth model, pioneered by Solow (1956), which was originally meant to resolve the razor-edge problem of the Harrod model (1939), could also successfully explain as to why certain countries on the globe are so rich and others so poor. At equilibrium, the growth rates of per capita income and capital intensity are closely inter-related. The production function often employed in growth models is Cobb-Douglas, with CRS specification and labour-augmenting technical progress plus the usual neoclassical assumptions. It may be expressed in the reduced form; with all variables in per capita terms:

$$\mathrm{Y_{(t)}} = \mathrm{K}^{\alpha}_{\mathrm{(t)}}\,[\mathrm{A_{(t)}}\,\mathrm{L}^{(1-\alpha)}_{\mathrm{(t)}}] \quad \Rightarrow \quad \mathrm{y_{(t)}} = \mathrm{A_{(t)}}\mathrm{k}^{\alpha}_{\mathrm{(t)}} \tag{1}$$

The symbols carry their usual meaning; 'Y' stands for gross output, 'K' for capital stock, 'L' for the labour force, 'k=K/L' for capital intensity and 'A' denoting the technology growing exogenously at a rate 'g'. Next utilizing the aggregate saving function ($S_{(t)}=sY_{(t)}$) and the incremental capital-output ratio (v=dK/dY), the fundamental equation of motion is readily obtained:

$$dk/dt = A_{(t)}sk^{\alpha}_{(t)} - n\,k_{(t)} \tag{2}$$

At the steady state equilibrium, the capital intensity stops changing. The time path of this variable depends directly on saving rate 's' and inversely on the growth rate of labour force/ population 'n'. This in turn leads to the relationship of per capita income with the same variables/parameters:

$$\mathrm{k^{*}_{(t)}} = \{\mathrm{A_{(t)}s/n}\}^{1/(1-\alpha)} \Rightarrow \quad \mathrm{y^{*}_{(t)}} = \mathrm{B_{(t)}}.\{\mathrm{s/n}\}^{\alpha/(1-\alpha)} = B_{(t)}.\{1/\nu\}^{\alpha/(1-\alpha)} \tag{3}$$

The symbols with asterisks denote the steady state values of the variables concerned, and the term $B_{(t)} = A_{(t)}^{\alpha/(1-\alpha)}$. It is now straight forward to show the growth rate of per capita income by the relation:

$$\ln \mathrm{y_{(t)}} = \ln \mathrm{B_{(t)}} + \{\alpha/(1-\alpha)\}\ln s - \{\alpha/(1-\alpha)\}\ln n \tag{4}$$

This relationship conveys an important message: other things remaining the same, countries with high investment and saving rates will grow faster while those with high population density will lag behind in the race. This is the crux of the model.

However, the basic neoclassical model came under criticism from two main angles.

First, the model failed to explain the (large) residual component in growth accounting. Solow attributed this factor to the 'measure of our ignorance'. However, it was believed to arise primarily due to the way technical progress was considered. The controversy during 1960's revolved around the question whether technical progress is exogenous or endogenous and whether it could be considered as embodied or disembodied. Further research led to the introduction of endogenous growth models ala Romer (1989) and Barro (1990) that emphasized on the role of human capital in development and growth. This also rejected the hypothesis of secular stagnation.

Second, the original model predicted that economies are likely to converge to the steady state equilibrium overtime. However, this very notion of convergence has been interpreted in different ways. Traditionally, it was believed that every economy may follow an independent growth path and converge to some steady state level peculiar to it. On the other hand, it was argued by some researchers that different economies are likely to converge to some common steady-state equilibrium in the long-run and that the growth rate tends to be inversely related to the starting level of income per capita. Thus, relatively poor economies could grow quickly as compared to their rich counterparts over time. However, the cross-country empirical evidence failed to support this prediction of catching-up. As emphasized by the endogenous growth models, rich economies have to grow faster and indefinitely due to higher rate of capital formation and technological advancement. In other words, the very existence of steady state equilibrium was refuted, given that investment in human capital leads to increasing returns and that human capital is a public good.

3.2 The Framework for Convergence Analysis

The primary source of convergence is believed to arise from the very assumption of diminishing returns to reproducible capital. Other sources of convergence include labour migration from poor to richer economies and the diffusion of technology. The catching-

up phenomenon is rationalized on the grounds that imitation and adoption of discoveries is comparatively cheaper than innovation and discoveries itself. In other words, technical progress may be relatively slower in leaders and rapid in follower economies[5].

3.2.1 Absolute Convergence

The contemporary studies on convergence generally follow the methodology suggested by Barro and Sala-i-Martin (1991). Log linearization of the differential equation (Eq-2) around the steady state gives the following relationship[6].

$$\ln y_t^{\circ} = e^{-\beta t} \ln y_0^{\circ} + (1 - e^{-\beta t}) \ln y_{ss}^{\circ} \qquad (5)$$

In the above equation, y_0° is the initial value of income per effective worker, y_t° is the income at time (t) so that it converges to equilibrium value (y_{ss}) in the limit as $t \rightarrow \infty$. The parameter 'β' captures the speed of convergence, which is determined by technology and preferences. If the technical progress is labour augmenting, we may rewrite the variables in per capita units, since the terms expressed in efficiency units are not directly observable. If the income per effective worker is denoted by $y_t^{\circ} = Y_t/A_t.L_t$, where $A_t = A_0\, e^{gt}$ and $L_t = L_0\, e^{nt}$, one gets the modified form by taking the logarithms and rearranging the terms as under:

$$\ln y_t = gt + e^{-\beta t} \ln y_0 + (1 - e^{-\beta t}) \ln A_0 + (1 - e^{-\beta t}) \ln y_{ss}^{\circ} \qquad (6)$$

If the length of interval between the initial and present time is 't' years, then by subtracting (*ln* y_0) from both sides of the above equation, dividing through 't' and rearranging the terms, an expression for the average growth rate is obtained:

$$\hat{y} = g - (1/t)(1 - e^{-\beta t})[\ln y_0 - \ln A_0 - \ln y_{ss}^{\circ}] \qquad (7)$$

The above relation indicates that growth comprises two components, the contribution due to technical progress (shifting of the P.F.) and the fraction due to the gap between the initial and steady state levels of income per capita (expansion along P.F.), where the speed of convergence is given by the slope parameter [- (1/t)(1-$e^{-\beta t}$)].

In addition to the single equation models, the researchers have also employed the panel data framework for convergence analysis. It allows pooling of the cross section and time

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5 See Barro and Sala-i-Martin (2004)

6 For details, see Gandolfo (1996) pp 175-89.

series data for a number of economies or regions. To derive the econometric model, we may consider equation (7) with one period interval that applies to the i^{th} economy in the sample. The annual growth rate is given by the following relation (with intercept given by: $\alpha = g + (1- e^{-\beta}) \ln (y^{*}_{ss} + A_{t-1})$. The random error term ($\varepsilon_{i,t,}$) may be included with usual properties.

$$y^{\wedge} = \ln y_{i,t} - \ln y_{i,t-1} = \alpha - (1 - e^{-\beta}) [\ln y_{i,t-1} - \ln A_{t-1}] + \varepsilon_{i,t} \qquad (8)$$

Equation (8) provides the framework generally used for testing absolute β-convergence. It may be possible to divided the entire time span into smaller sub-periods (of length 'd') so that the average growth rate of income per capita (between time 't' and 't-d') for the economy concerned may be regressed on the level of income in the past period. Thus the above equation may be written in the modified format as under:

$$y^{\wedge} = (1/d) \ln [y_{i,t} / y_{i,t-d}] = \gamma - \lambda \ln y_{i,t-d} + \varepsilon_{i,t} \qquad (9)$$

The slope parameter, given by: $\lambda = (1/d)(1- e^{-\beta t})$ captures the speed of convergence, whereas the intercept term, given by: $\gamma = g + \lambda (\ln y_{ss} + A_{t-d})$, captures the effects of technical progress and other unobservable determinants of steady state.

The above specification, however, suits the economies that are closer to one another in structural characteristics (e.g. OECD); and therefore may exhibit absolute convergence. The common intercept in such models constrains all the economies to have the same steady state level, which is a highly restrictive assumption. Obviously, this kind of model may not be suitable for convergence analysis in other economies exhibiting vast differences in socio-economic structures.

3.2.2 Conditional Convergence

The occurrence of absolute convergence is a rare phenomenon as compared to conditional convergence, which is most likely to hold. In this case, the economies are expected to converge towards their peculiar steady states rather than to a common equilibrium (Mankiw, Romer, and Weil 1992). As such, a single variable (initial level of per capita income) might not be sufficient to explain the differences in growth rates across heterogeneous economies.

Many empirical studies on conditional convergence have used specifications similar to the general format given below. The growth rate of income per capita in an economy

($g_{i,t}$) and for a given period is regressed on the income per capita with one period lag ($y_{i,t-1}$) and the set of conditioning variables ($x_{i,t}$) meant to control for the differences in the steady state of economy[7].

$$g_{i,t} = \delta\, x_{i,t} - \beta\, y_{i,t-1} + \varepsilon_{i,t} \qquad (10)$$

However, this general (informal) specification provides no information regarding the values of structural parameters since it is based on reduced form equation. In order to avoid this limitation, it is necessary to introduce explicitly a number of conditioning variables like investment rates, population growth rates, differences in the industrial structures, net migration rate of labour, some proxies for accumulation of human capital and certain dummies to control for other differences across the economies. The researchers have therefore tried to estimate the 'structural' convergence equations derived explicitly from the formal models[8]. Mankiw et al (1992) resort to the assumptions of diminishing returns to reproducible capital and that technical progress is a public good (diffuses evenly through all economies); both factors responsible for convergence as discussed above. We discuss the fundamentals of the augmented growth model[9] used for conditional convergence.

The production function may be rewritten in the modified form so as to capture the impact of human capital accumulation. Again, the specification may be Cobb-Douglas and the model may also be written in reduced form:

$$\mathrm{Y_t} = \mathrm{K_t^{\alpha}\ H_t^{\omega}[A_t\ L_t\ ]^{(1-\alpha-\omega)}} \quad \Rightarrow \quad \mathrm{y_t^*} = \mathrm{k_t^{\alpha}\ h_t^{\omega}} \qquad (11)$$

The symbol 'H' denotes the stock of human capital, assumed to be a public good, and the coefficients α and ω measure the partial output elasticities with respect to factor inputs. The labour force (measured in efficiency units) should grow at the composite exponential rate (n+g). The augmented production function now exhibits increasing returns to scales in aggregate but the property of diminishing marginal returns applies to individual factors.

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7 The researchers have used up to 50 different conditioning variables, following Barro (1991).

8 Barro and Sala-i-Martin (1992) use the Cass-Koopman's optimal savings version of the neoclassical growth model while Mankiw, Romer, and Weil (1992) derive the specification from Solow-Swan model.

9 For details please refer to Barro and Sala-i-Martin (2004), and Mankiw (1995)

As before, the quantities per unit of effective worker may be expressed by: $y_t^{\circ} = Y_t/A_t.L_t$, $k_t^{\circ} = K_t/A_t.L_t$, and $h_t^{\circ} = H_t/A_t.L_t$. Likewise, the fraction of income invested in physical and human capital may be denoted by the proportions s_k and s_h respectively such that these sum up to the aggregate saving rate: $s_k + s_h = s = S/Y$. With these manipulations, along with incorporation of the depreciation rate (denoted by δ), the equations of motion for physical and human capital may be expressed as under (the counterparts of Eq-2):

$$\frac{dk}{dt} = s_k\, k_t^{\alpha} h_t^{\omega} - (n+g+\delta)\, k_t \quad and \quad \frac{dh}{dt} = s_h\, k_t^{\alpha} h_t^{\omega} - (n+g+\delta)\, h_t \qquad (12\ a,b,)$$

The steady state equilibrium is said to occur in the long run where the levels of physical and human capital per effective worker stop changing further. Utilizing this information and solving for the resultant equations, one gets the steady state values for physical and human capital per effective worker[10]. Substituting these values back into production function, and by taking logs, the determinants of steady state are readily obtained. The steady state income depends on the parameters: A, s_k, s_h, n, g, δ, α and ω.

$$\ln y_t^{*} = \ln A + gt + [\frac{\alpha}{1-\alpha-\omega}] \ln s_k + [\frac{\omega}{1-\alpha-\omega}] \ln s_h - [\frac{\alpha+\omega}{1-\alpha-\omega}] \ln (n+g+\delta) \qquad (13)$$

The conditional convergence explicitly takes into account the possible differences in the determinants of steady state and hence demands incorporation of appropriate variables. The important considerations as to, which variables ought to be included, which elements should be allowed to vary and how, and which should be assumed to remain constant across economies; have been debated in growth literature. Conditional convergence then implies that the growth rate of an economy is positively related to the distance between its steady state level and current level of income. To examine the dynamics of regional economies along transition to their steady states, the speed of convergence (β) can be expressed as[11]

$$d/dt\ (\ln y_t) = \beta\ [\ln y_{ss} - \ln y_t\ ] \qquad (14)$$

In the above relation, β = (1-α-ω) (n+g+δ), which implies that for given steady state, an economy with higher level of per worker income at the start exhibits a lower growth rate

[10] For details, please see Gandolfo (1996) pp 286-87.

[11] See Mankiw, Romer and Weil (1992).

and vice versa. On solving the above differential equation, we get an expression for convergence as under:

$$\ln y_t^{\circ} = e^{-\beta t} \ln y_{t-\tau}^{\circ} + (1 - e^{-\beta t}) \ln y_{ss}^{\circ} \quad (15)$$

In this relation, $y_{t-\tau}^{\circ}$ is the initial value of income per effective worker and τ is the starting point. Substituting for ln $y_{t-\tau}^{\circ}$ from above in equation (13), and then transforming the per worker terms into per capita terms, we get the following relation:

$$\begin{aligned} \ln y_t - \ln y_{t-\tau} &= (1 - e^{-\lambda\tau})[\ln A_0 - \ln y_{t-\tau}] + [(1 - e^{-\lambda\tau}) gt + e^{-\lambda\tau} g\tau] \\ &+ (1 - e^{-\lambda\tau})[(\tfrac{\alpha}{1-\alpha-\omega}) \ln s_k + (\tfrac{\omega}{1-\alpha-\omega}) \ln s_h - (\tfrac{\alpha+\omega}{1-\alpha-\omega}) \ln (n + g + \delta)] \end{aligned} \quad (16)$$

The above relation provides the requisite specification for empirical analysis. If the speed of convergence 'λ' is positive, α >0, ω>0 and (α+ ω) < 1 as assumed by the model, the signs of the coefficients can be easily predicted.

Mankiew et al (1992) have also employed the basic neoclassical model to investigate the hypothesis of conditional convergence. The determinants of growth then simply include the technology level and the observable variables like saving rates, initial level of income per worker and population growth rates. The model assumes the following shape and predicts not only the sign of each coefficient but also its magnitude:

$$\begin{aligned} \ln y_t - \ln y_{t-\tau} &= (1 - e^{-\lambda\tau}) \ln A_0 + [(1 - e^{-\lambda\tau}) gt + e^{-\lambda\tau} g\tau] \\ &- (1 - e^{-\lambda\tau}) \ln y_{t-\tau} + (1 - e^{-\lambda\tau}) (\tfrac{\alpha}{1-\alpha})[\ln s - \ln (n + g + \delta)] \end{aligned} \quad (17)$$

3.2.3 The Dynamic Panel Framework

As discussed above, the panel data approach can correct the omitted variable bias by allowing for differences in technologies across regions. Islam (1995) restructures the neoclassical model and interprets the term: $(1-e^{-\lambda\tau}) \ln A_{(0)}$ as the time-invariant region-specific effect while using the panel framework. Using the notation of panel data approach, we may rewrite equation (16) for a given region as:

$$\ln y_{i,t} = \alpha \ln y_{i,t-1} + \sum_{j=1}^{3} \theta_j \, x_{i,t}^{j} + V_t + \mu_i + \varepsilon_{i,t} \qquad (18)$$

$$where \;\; \alpha = e^{-\lambda\tau}, \theta_1 = (1-e^{-\lambda\tau})(\tfrac{\alpha}{1-\alpha-\beta}), \theta_2 = (1-e^{-\lambda\tau})(\tfrac{\beta}{1-\alpha-\beta}),$$

$$\theta_3 = -(1-e^{-\lambda\tau})(\tfrac{\alpha+\beta}{1-\alpha-\beta}), \; x_{1,i,t} = \ln s_k, \; x_{2,i,t} = \ln s_h, \; x_{3,i,t} = \ln(n+g+\delta),$$

$$V_t = [(1-e^{-\lambda\tau})gt + e^{-\lambda\tau} g\tau], \mu_i = (1-e^{-\lambda\tau}) \ln A_0 .$$

The set of conditioning variables (denoted by x_i) capture the differences in the steady states across regions. The 'V_t' term signifies the time specific effects, which include the rate of technological change. The next term 'μ_i' is region-specific factor that represents the combined effect of institutions, resource endowment, climate, customs and traditions etc. This component varies across regions and picks up the effect of any omitted variable that does not vary over time in a panel. Finally, 'τ' is the time interval of four/five year period and 'ε_{it}' represents the usual error term that varies across regions and time.

4.0 Data and Methodology

In order to test the hypothesis of income convergence across different regions of Pakistan over time, the appropriate economic unit might be the district or even the union council. However, the requisite data is available only at the provincial level, fortunately with rural-urban disaggregation. The tribal areas (FATA), the northern areas (Gilgit-Baltistan) and Azad Kashmir are excluded due to data constraints. The available information covers the period from 1979 to 2005. The important data sets used in the analysis comprise the household per capita income, savings rates, literacy rates, combined enrollment ratios, dependency ratios, population growth rates, crude birth rates and infant mortality rates[12].

Human capital is an important determinant of economic growth and convergence besides physical capital and labour force. It is indicated by education, training and experience as well as good health and physique; but it is difficult to measure. Mankiw, Romer and Weil (1992) have used the secondary school enrollment rate as proxy for human capital, whereas Sala-i-Martin (1997) has used life expectancy at birth as proxy

[12] The data is derived from official sources like the Economic Survey, the HIES (PSLM), Demographic Survey, the Labor Force Survey, the Education and Development Statistics of the provinces etc.

for non-educational human capital and school enrollment rate for educational human capital. We have preferred to construct a composite index of human capital following the construction of Human Development Index (HDI) by the UNDP (1997).The proposed index includes proxies for both education and health[13].

Panel data estimation is made possible by dividing the available period-wise information for each region into several shorter time spans. We consider a span of four/five years to be appropriate, which is also the standard practice followed in empirical research work. Dividing the total time period (1979-2005) into shorter spans, we obtain a total of six panels for each of the province. The constructed intervals are 1979-1984, 1984-1988, 1988-1993, 1993-1997, 1997-2001, 2001-2005. The dependent variable is the logarithm of per capita (per worker) income by the end point of each time span where the most important explanatory variable is the lagged value of income per capita (in log form). Other variables such as saving rates, labour force growth rates and human capital are averaged over four/five year period for each region[14].

An important issue that arises while using the panel data is whether the individual region-specific effects should be considered fixed or random. The disturbance term (OLS specification) does not take into account the unobserved differences among the regions, which may be important. The fixed effect specification may then be appropriate choice. The dynamic panel growth model with fixed effect allows us to control for the unobserved differences among the steady states of regions in addition to the observed differences, the later captured by the set of conditioning variables. The empirical work based on single cross-section regressions may suffer from two inconsistencies, i.e. omitted variables and endogeneity bias. The first bias arises when the region-specific effects are assumed to be uncorrelated with other explanatory variables and the second arises when certain explanatory variables happen to be endogenous[15]. The reliability and consistency of the estimates is then a serious issue. Islam (1995) has used a fixed effect specification (least square dummy variable technique) to estimate the panel data

[13] First we estimate the education index by giving 2/3 weight to literacy and 1/3 to secondary school enrollment, where the maximum is 100 and minimum is zero. Next we estimate the health index by giving 60% weight to infant survival and 40% to crude birth rate, where the maximum expectancy is 85 years and minimum is 25 years. The compound human capital index is then the simple average of the two indices.

[14] The data set used in the analysis can be provided on request.

[15] For details, see Caselli, Esquivel and Lefort (1996) and Durlauf and Quah (1999).

model so as to address these limitations. Caselli, et al (1996) suggested that the first difference GMM approach deals successfully with both the issues.

Durlauf and Temple et al (2004) point out that omitted unobserved region-specific effects in dynamic panel model cause the least square estimators to be biased and inconsistent. The fixed effect or within groups estimator, which takes into account the unobserved region-specific effects, also provides biased and inconsistent estimates. This is due the fact that the lagged dependent variable is correlated with the mean of individual errors. Bond, Hoeffler & Temple (2001) and Durlauf & Temple et al (2004), suggest that the 'least square estimate' may provide the (approximate) upper bound on the coefficient of lagged variable and the 'within group estimate' can be regarded as the (approximate) lower bound. Thus an estimate lying between the two may be consistent.

5.0 Empirical Analysis and Results

We applied different estimation techniques, discussed above, to the panel data so as to compare the results and find consistent estimates. We confronted the data set to test for absolute as well conditional convergence. The results are discussed below.

5.1 The Absolute Convergence

To see the existence of unconditional (absolute) convergence, the model given by equation (9) is used, in which the only regressor is the lagged value of the dependent variable - the growth rate of real per capita income. As noted above, the slope parameter (λ) captures the speed of convergence. The coefficient with a negative sign and statistically significant value would imply absolute convergence to the steady state common for all regions and vice versa. By implication, a zero value of the parameter (or non-zero but insignificant) indicates no convergence or divergence, which shows that each region follows an independent growth path. Next we focus on the analysis.

5.1.1 Aggregate Analysis

Table-1 reports the cross-sectional regression results, which cover a period of twenty six years (1979 - 2005) and correspond to income per worker. We have divided this time span into three sub-periods, (1979-1988), (1988-1998) and (1998-2005) in order to find the evidence of convergence, if any, separately. Another reason for this division into

sub-periods is to test whether the political and macroeconomic stability (instability) bears any implications for absolute β-convergence[16].

Table 1: Cross-Sectional Tests for Absolute Convergence (Aggregate)

Dependent variable ln (y_t / y_{t-1})

	(Overall)	(……..Period-wise ……..)		
PERIODS	(1979-2005)	(1979-1988)	(1988-1998)	(1998-2005)
CONSTANT	4.349	4.318**	0.123	- 2.288
standard error	3.488	0.668	9.764	5.351
T- value	1.247	6.461	0.013	- 0.428
P- value	0.339	0.023	0.991	0.711
Ln (yt-1)	- 0.522	- 0.533**	- 0.018	0.317
standard error	0.454	0.087	1.235	0.684
T- value	- 1.149	- 6.121	- 0.014	0.464
P- value	0.370	0.026	0.990	0.688
ß=Implied speed	0.028	0.074	0.002	N/A
R^2	0.397	0.924	0.060	0.503

NOTE: All regressions are for the four provinces of Pakistan.

** Significant at 5% level

Column (1) reports the results for the entire period. The coefficient for the explanatory variable is negative but statistically insignificant. Thus, the data do not provide any evidence in favour of β-convergence in Pakistan. For the sub-period (1979-1988), there coefficient is negative and statistically significant. This is a strong evidence of convergence during the period concerned where the R^2 is quite high and the implied speed of convergence is 7.4% per annum, which is respectable. In other words, the hypothesis of convergence cannot be rejected for the sub-period under reference. However, this trend could not be sustained during the next decade (1988-1998), where the sign is correct (negative) but the coefficient is close to zero and statistically

[16] The first and third sub-periods represent the military-guided, semi-democratic regimes of General Zia-ul-Haq and General Pervez Musharaf respectively. The second sub-period shows the so called fake-democratic regime. Although the country was ruled by publicly elected governments during this period but these were politically unstable. Four elections were held during 10/11 years but no elected government could complete its tenure.

insignificant. During the third sub-period (1998-2005), the results are just in the opposite direction. The concerned coefficient bears a positive sign, however it is statistically insignificant. This implies a weak signal of divergence. The results support the claims that poverty and inequalities have increased across Pakistan during the recent past.

To sum up, there are no signs of convergence when the entire time span is considered. However, the signs of regional income convergence could be seen during the sub-period (1979-1988) only, which can be rationalized on the basis of certain ground realities. For instance, the overall economic performance was better relative to other developing countries around the globe; the growth rate was high and inflation rate was mild, which may be seen from the World Bank reports[17]. There was a sharp increase in worker's remittances during the era, which boosted up the living standard of masses. Nadeem-ul-Haq (1999) believes this to be the most important factor in reduction of poverty during 1980s.

5.1.2 Urban-Rural Analysis

Next we confront the available data in rural and urban breakdown for convergence analyses in rural and urban areas separately. The rural and urban areas can be considered as separate entities due to the obvious difference in their socio-economic and political structure. Although the concept of convergence in rural and urban areas is more difficult to imagine within the existing administrative set up, however the available information allows us to see the dynamics and have some useful insights.

Table 2 is concerned with rural areas. We follow the same methodology as for the aggregate analysis. It can be seen that the coefficient for the explanatory variable concerning the entire period (1979-2005) is negative, but significant only at 10% level. However, when the time span is divided into three sub-periods, (1979-1988), (1988-1998) and (1998-2005), the slope coefficient alternates in sign but not significantly different from zero. The very base and the vital component of our rural economy is the agricultural sector, which primarily depends on the forces of nature. Therefore, the results might have been affected by shocks to agricultural produce. Our rural economy,

[17] The average real GDP growth rate per annum was 6.15% and inflation rate of Pakistan was 6.74% during 1980s as compared to the average rates of developing countries: annual real GDP growth rate of 4.49% and inflation rate of 34.72% during the decade.

Table 2: Cross-Sectional Tests for Absolute Convergence (Rural Areas)

	Dependent variable $\ln(y_t / y_{t-1})$			
	(Overall)	(……..Period-wise ……..)		
PERIODS	(1979-2005)	(1979-1988)	(1988-1998)	(1998-2005)
CONSTANT	3.385*	2.497	-0.530	2.013
standard error	1.071	2.327	4.751	3.236
T- value	3.161	1.073	-0.112	0.622
P- value	0.087	0.396	0.921	0.597
Ln (yt-1)	-0.399*	-0.284	0.061	-0.241
standard error	0.135	0.316	0.612	0.424
T- value	-2.947	-0.900	0.100	-0.567
P- value	0.098	0.463	0.930	0.628
ß=Implied speed	0.020	0.033	N/A	0.039
R^2	0.685	0.288	0.005	0.577

NOTE: All regressions are for the four provinces of Pakistan.

*Significant at 10% level of significance

especially in Punjab and Sindh provinces, performs better in the years when agricultural productivity is high.

Table 3: Cross-Sectional Tests for Absolute Convergence (Urban Areas)

	Dependent variable $\ln(y_t / y_{t-1})$			
	(Overall)	(……..Period-wise ……..)		
PERIODS	(1979-2005)	(1979-1988)	(1988-1998)	(1998-2005)
CONSTANT	4.351***	8.427	9.673**	0.360
standard error	0.107	5.986	2.456	2.253
T- value	40.555	1.408	3.938	0.160
P- value	0.001	0.294	0.059	0.888
Ln (yt-1)	-0.489***	-1.035	-1.173*	-0.022
standard error	0.013	0.748	0.301	0.273
T- value	-36.457	-1.384	-3.892	-0.080
P- value	0.001	0.301	0.060	0.944
ß=Implied speed	0.026	N/A	N/A	0.003
R^2	0.998	0.489	0.825	0.003

NOTE: All regressions are for the four provinces of Pakistan.
Levels of statistical significance are indicated by asterisks.

*** Significant at 1% level of significance
** Significant at 5% level of significance
* Significant at 10% level of significance

Similar results can be seen in Table 3 that concerns with the urban regions. The regression coefficient for the explanatory variable has the correct sign and it is statistically significant even at 1% level for the entire period from 1979 to 2005. The regression has a good fit. However, when the time span is divided into sub-periods, the coefficients turn out to be insignificant, although the signs are correct. In this case, the regression is good fit for the period (1988-98) only.

The implied speed of convergence for the rural and urban economies works out to be 2% and 2.6% per year respectively, when we consider the entire period. These results indicate that rural and urban economies are not likely to converge to the common steady state; rather they are following their independent growth paths. However, more tests are needed to explain the nature and causes of growth in rural and urban economies separately since the lonely variable (initial per worker income) is not sufficient to explain the complex process of growth and convergence.

5.2 The Conditional Convergence

In the absence of satisfactory evidence on absolute convergence, it is necessary to verify the hypothesis under specific regional conditions. The existence of significant natural, social and historical differences among different geographical regions of Pakistan renders them less likely to converge towards the same equilibrium. This diversity can be seen via a number of indicators like the literacy rate, rate of saving, population density, life expectancy, infrastructure facilities, degree of urbanization, the rule of law, social and family structure etc. Furthermore, these disparities have been increasing over time across different regions.

We have tried three estimation techniques, namely the OLS estimators, the Fixed or within groups estimators and the GMM estimators meant for the panel data framework. To explore the evidence of conditional convergence, we employ two different specifications of the neoclassical growth model. First is the original neoclassical model due to Solow (1956) and second is the modified version due to Mankiw, Romer and Weil (1992) that augments the former with human capital. Next we focus on the results.

5.2.1 Estimation via the Basic Neoclassical Model

We begin our analysis with the basic neoclassical model without any provision for human capital. The specification for the panel data estimation is provided by equation (17), in which the intercept captures the region-specific effects. The evidence of convergence rests on the sign and size of the coefficient for lagged real per capita income. A statistically significant value of the coefficient bearing a negative sign implies conditional convergence. Other variables on the right hand side measure differences in the steady state levels.

The results are presented in Table-4. The first column reports the OLS estimation obtained by simply pooling the time series and cross section data. The second column reports estimation through the fixed effects model or Within Groups (WG) estimators. The third column reports the results of first differenced Generalized Method of Moments (GMM) ala Arellano and Bond (1991).

Table 4: Panel Data Tests for Conditional Convergence

Estimation via the Basic Neoclassical Mode)

Dependent Variable ln $Y_{i,t}$ -- ln $Y_{i,t-1}$

Variables	Least squares	Fixed Effect (WG)	DIF-GMM
ln ($y_{i,t-1}$)	- 0.238	-1.262**	- 0.331***
	(0.148)	(0.177)	(0.074)
ln ($s_{i,t}$)	0.012	0.024*	0.020*
	(0.019)	(0.013)	(0.012)
ln ($n_{i,t}$+g+δ)	- 0.733	- 0.260	- 0.319*
	(0.457)	(0.294)	(0.191)
Implied λ	**0.054**	**N/A**	**0.080**
J-statistic			14.402
Instrument rank			16.000
Sargan Test(P-value)			**0.346**

Notes: Data used over four/five years intervals between 1979 and 2005. The symbol (λ) denotes the convergence speed. Standard errors given in parentheses.
* Significance at 10% level, ** Significance at 5% level, *** Significance at 1% level.
The figures reported for the Sargan test are the p-values of the null hypothesis for valid specification. J-statistic is simply the Sargan test of over-identifying restrictions.

A comparison of the results in the first row reveals that the OLS provides higher estimates than WG method. The signs in both cases are correct. The OLS estimates a value of (– 0.238) and WG provides a value of (–1.262) for the coefficient (the initial level of per capita income). Fortunately, the value given by the GMM estimator (- 0331) falling within the upper and lower bound and therefore it is more likely to be unbiased

and reliable. The validity of the instrumental variables used in the GMM estimation can be checked by Sargan test. The p-value (0.346) strongly suggests that the instrumental variables used in the analysis are valid.

In view of the above, the results obtained from the first differenced GMM technique seem to be appropriate. All the coefficients are statistically significant and bear the expected signs. In particular, the coefficient of lagged per capita income supports conditional convergence across regions. The coefficient of saving indicates that one percent increase in saving rate will lead to a small increase of 0.02 percent in growth of real income. Likewise, an increase of one percent in the growth rate of population will be followed by 0.32 percent decline in growth rate of real income.

The speed of convergence 'λ' can be estimated from the coefficient of lagged income. The implied speed of convergence is 8 % per year[18]. The results show that most of the regions are nearer to their respective steady states level. The differences across the regions in the prevailing income levels can be explained by the differences in the factors that determine the respective steady state levels. These factors or conditioning variables might not only be different across the regions but also might be changing within a region over time.

5.2.2 Estimation via the Augmented Model

Human capital is another important variable that is considered in empirical literature on growth besides savings and population growth rates. We estimate an augmented version in which the production function also includes the stock of human capital, as shown in equation (18) above. The panel data results are reported in Table-5.

For the first differenced GMM estimator, the coefficient of lagged income is highly significant. It falls between the upper and lower bounds given by the OLS and WG estimates and it is also consistent with the results of Table-4. The p-value (0.366) given by the Sargan test does not reject the validity of the instruments used in the analysis. Likewise, the coefficients of saving and population growth have the expected signs. The coefficient of human capital is positive and statistically significant, which indicates its

[18] The half life of convergence process is given by the formula: $T = \ln(2)/\lambda$, and if $\lambda = 0.08$, $T = 8.67$ years. The estimated half life of convergence (the time it takes to eliminate half of the gap between steady state and actual real per capita income).

importance for growth. The speed of convergence 'λ' is slightly higher than the estimate given by the basic neoclassical model and shown in Table-4.

Table 5: Panel Data Tests for Conditional Convergence

(Estimation via the Augmented Neoclassical Model)

Dependent Variable ln $Y_{i,t}$ -- ln $Y_{i,t-1}$

Variables	Least squares	Fixed Effect(WG)	DIF-GMM
ln ($y_{i,t-1}$)	- 0.238	- 1.315***	- 0.359***
	(0.152)	(0.176)	(0.028)
ln ($s_{i,t}$)	0.011	0.031**	0.027*
	(0.020)	(0.014)	(0.014)
ln ($n_{i,t}$+g+δ)	- 0.731	- 0.256	- 0.302
	(0.472)	(0.287)	(0.245)
ln ($h_{i,t}$)	- 0.009	0.732	0.665**
	(0.492)	(0.539)	(0.337)
Implied λ	**0.054**	**N/A**	**0.089**
J-statistic			14.106
Instrument rank			17.000
Sargan Test(P-value)			**0.366**

Notes: Standard errors are given in parentheses, (λ) denote the annual convergence rate.

* Significance at 10% level, ** Significance at 5% level, *** Significance at 1% level.

5.2.3 Estimation via the Restricted Models

In this section, we address the question whether the estimates obtained are consistent with the predictions of growth models or otherwise. The data is considered to support predictions if the estimated coefficients carry the predicted signs and have the expected magnitudes. The signs and magnitudes of the coefficients as predicted by the formal models and shown in Tables 4 and 5 make it convenient to test the models under restrictions. The restricted least squares technique can help in this regard.

First, with reference to the basic neoclassical model, we apply the restriction that the coefficients of saving and population growth rates [ln(s) and ln(n+g+δ)] are equal in magnitude but opposite in sign. Although, the concerned estimates reported in Table-4 are somewhat different, however we re-estimate the model by imposing this restriction. This also enables us to find the implied share of physical capital (α). Equation (17) may be rewritten in modified form as under.

$$\ln(y_{i,t} / y_{i,t-1}) = \gamma_0 + \gamma_1 \ln y_{i,t-1} + \gamma_2 [\ln s_{i,t} - \ln (n_{i,t} + g + \delta)] + \varepsilon_{i,t} \qquad (17\ a)$$

The coefficients denote: $\gamma_0 = (1- e^{-\lambda t}) \ln A_0$, $\gamma_1 = -(1- e^{-\lambda t})$, $\gamma_2 = \gamma_3 = (1- e^{-\lambda t})\ (\alpha/(1-\alpha))$.

The regression results, after incorporating the restriction, are reported in Table-6. The p-value (0.0861) for GMM technique given by the Wald test clearly rejects the hypothesis ($\gamma_2 + \gamma_3 = 0$), which implies that our data do not support the predictions of the neoclassical model. The implied value of the share of physical capital estimated in GMM case is 0.064, which is very low.

Table 6: Panel Data Tests for Conditional Convergence
(Restricted Basic Neoclassical model)

Dependent Variable $\ln Y_{i,t} - \ln Y_{i,t-1}$

Variables	Least squares	Fixed Effect(WG)	DIF-GMM
ln ($y_{i,t-1}$)	-0.0068	-1.2306***	-0.2866***
	(0.0178)	(0.1707)	(0.0693)
ln ($s_{i,t}$) - ln ($n_{i,t}$+g+δ)	0.0154	0.0236*	0.0197
	(0.0192)	(0.0133)	(0.0155)
Implied λ	**0.001**	**N/A**	**0.07**
Implied α	**0.6931**	**0.019**	**0.064**
Wald test: p-value	**0.199**	**0.131**	**0.0861**

Notes: Standard errors in parentheses. Three asterisks, two asterisks, and one asterisk denote statistical significance at 0.01, 0.05, and 0.10 levels respectively.

Table 7: Panel Data Tests for Conditional Convergence
(Restricted Augmented Neoclassical Model)

Dependent variable $\ln(Y_{i,t}) - \ln(Y_{i,t-\tau})$

Variables	Least squares	Fixed Effect(WG)	DIF-GMM
ln ($y_{i,t-1}$)	- 0.100	-1.302***	- 0.353***
	(0.093)	(0.174)	(0.045)
ln ($s_{i,t}$) – ln ($n_{i,t}$+g+δ)	0.019	0.028*	0.025**
	(0.020)	(0.013)	(0.013)
ln ($h_{i,t}$) – ln ($n_{i,t}$+g+δ)	0.371	0.340	0.367*
	(0.363)	(0.248)	(0.242)
Implied λ	**0.021**	**N/A**	**0.087**
Implied α	**0.039**	**0.017**	**0.033**
Implied β	**0.758**	**0.204**	**0.493**
Wald test: p-value	**0.27**	**0.41**	**0.2545**

Notes: Standard errors in parentheses. Three asterisks, two asterisks, and one asterisk denote statistical significance at 0.01, 0.05, and 0.10 levels respectively.

Second, with reference to the augmented neoclassical model, we may examine the restrictions that the coefficients of physical capital (saving rate) and population growth

rate as well as the coefficients of human capital and population growth rate sum to zero. In this regards, equation (16) may be rewritten as under:

$$\ln(y_{i,t} / y_{i,t-1}) = \gamma_0 + \gamma_1 \ln y_{i,t-1} + \gamma_2 [\ln s_{i,t} - \ln(n_{i,t} + g + \delta)] + \gamma_3 [\ln h_{i,t} - \ln(n_{i,t} + g + \delta)] + \varepsilon_{i,t} \quad \text{(16 a)}$$

The coefficients are defined as: $\gamma_2 = (1- e^{-\lambda t}) [\alpha/(1-\alpha)]$, $\gamma_3 = (1- e^{-\lambda t}) [\omega/(1-\alpha)]$, where 'α' is the share of physical capital and 'ω' is the share of human capital in per capita income. The estimated results from the restricted regression are reported in Table-7.

The restriction implied by the augmented neoclassical model can not be rejected at the conventional levels of significance (i.e. with p-value 0.2545**).** The results from first differenced GMM show the share of physical capital to be 0.033, which is very low and unrealistic, and the share of human capital is 0.49, which is quite reasonable. So it can be concluded that the data support the predictions of augmented model to some extent but does not do so in case of basic neoclassical model.

Moreover, we can observe that estimates of convergence coefficient are not affected by restricting both the models and remain almost same as those obtained from unrestricted models and reported in Table (4 and 5). This behaviour indicates that the coefficients are consistent with the specifications shown above, and the results for the speed of convergence are robust.

5.3 The Sigma Convergence

Some interesting results could also be derived by confronting the data to analyze sigma-convergence. By comparing the findings between per capita and per worker income, the regional disparities in terms of per capita incomes appeared to be more severe than that of per worker incomes. The finding implies that the number of dependent or inactive members of the population is responsible for higher dispersion of per capita income. This is in line with the conventional wisdom, since a higher dependency ratio means higher consumption or lower saving rates and thereby lower growth rates. An application of the model to rural and urban areas separately revealed that the intra-regional differences in the socio-economic conditions are as serious as the inter-regional differences. To sum up, the findings indicate that incomes per capita

across the provinces are moving farther away from one another overtime and there is little tendency for reducing of disparities[19].

6.0 Conclusions and Policy Implications

The evidence on conditional convergence indicates that each regional economy converges to its specific steady state, rather than to a common equilibrium. However, it does not tell about prevalence of regional disparities; as to how they appeared or gravitated overtime and how they could be addressed. Hence, conditional convergence neither implies necessarily a reduction in regional disparities nor does it contradict with trends of increasing disparities.

The present study has examined the phenomenon of convergence of per capita income to steady states across the four provinces of Pakistan with rural-urban splits over the period from 1979 to 2005. We could find no evidence of absolute convergence for the entire time span of 26 years from 1979 to 2005 except for the period 1979-88, when the signs of regional convergence could be observed. However the trend could not continue thereafter, rather the symptoms of divergence were observable for the period 1998-2005. Put differently, the absence of absolute convergence predicts an increase in disparities over time across regions. On the other hand, a strong evidence of conditional convergence could be observed both in aggregate and rural-urban divisions. The findings imply that differences in the socio-economic conditions prevailing across the political entities are crucial and responsible for economic disparities to persist. Pakistan has been undergoing substantial structural changes in recent years, so the steady state determinants also changing constantly[20].

The differences in social, cultural and political behaviors across the four provinces of the federation are natural and can be easily understood. However, the prevalence of abject poverty and gross inequalities over the long run, both across the regions and within the regions in rural-urban bifurcation, is posing problems. This situation needs serious attention and calls for immediate remedial measures, failing which the dangerous sense

[19] We do not report the detailed results for space constraints, which may be provided on request.

[20] These changes might be in response to the aftermaths of 9/11 event that have drastically upset the geo-political environment in Afghanistan and Pakistan. The US intervention has resulted into massive destruction via terrorist activities in all parts of the country and has aggravated problems in FATA and Baluchistan.

of deprivation will continue to develop and lead to political instability. Economic theory predicting convergences across regions subject to fulfillment of certain assumption can help in this regard. The growth rate of a region is affected by both the distance from the steady state and the shift in the steady state itself. There are sufficient evidences that the important part of growth process is not convergence to steady state level per se, rather the factors responsible for determination of steady state equilibrium are more important. If any public policy can shift the steady state level of income per capita, then the growth rate of that region should also accelerate. Alternatively, all the regions can converge to some common steady state equilibrium (and thereby economic disparities removed) if and only if the differences in the factors responsible for the steady state level of income across the respective regions could be minimized somehow via appropriate public policies.

Special efforts are therefore needed to enhance investment, not only in physical infrastructure but also in the social sector and human capital, to improve the conditions of living in targeted parts of the country, which were either ignored in the past or remained lagging on the path to prosperity for one reason or the other. In particular, special attention is needed to improve the efficiency of labour and to generate more employment opportunities in the relatively poorer rural regions. "Regional prosperity implies strengthening of the federation" can be considered as a simple rule of thumb. High GDP growth is meaningless if does not reduce the sufferings of masses. Further research is needed to identify the peculiar determinants of growth, keeping in view the socio-political circumstances prevailing in different regions of the country.

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