

## Convergence in Human Development Index across Countries: An Empirical Investigation

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*The concept of  $\sigma$ -convergence and unconditional  $\beta$ -convergence has been applied to the components of human development - health status (measured by average life expectancy); education status (measured by adult literacy rate); per capita gross domestic product and aggregate human development index in order to examine whether poor countries are catching up the rich or not. The results of the study indicate the presence of  $\sigma$  and  $\beta$  convergence for human development index, health status and education status. However, in case of per capita gross domestic product neither  $\sigma$  nor unconditional  $\beta$ -convergence has been observed. The presence of convergence in terms of indicators of education and health gives some hope of convergence in income also, but may take some time.*

### I Introduction

Convergence or catch-up takes place when poorer economies' per capita income grows at a faster rate than that of the richer economies. There are three possible and related forms of convergence: (i) unconditional  $\beta$ -convergence, (ii) conditional  $\beta$ -convergence, and (iii)  $\sigma$ -convergence. Poorer countries tend to grow faster than the rich countries because of the diminishing marginal returns to capital in the rich countries because of relatively high level of capital per labour in them (Noorbakhsh 2006). Unconditional  $\beta$ -convergence can be estimated by regressing the average growth rate of per capita income on the log of its initial value and if the slope parameter turns out to be negative, then its presence is confirmed. In this case,  $\beta$  is obtained without considering the estimation of set of structural variables on the assumption that the economies do not differ significantly in their levels of technology, investment ratio, industrial structure, quality of human capital and other structural factors (Marques and Soukiazis 1998). Conditional  $\beta$ -convergence mainly takes into consideration the steady-state growth path of the country. If the structural conditions of the countries were different, the respective long-run growth rates would be different which may result in divergence or at best a very weak convergence. This type of convergence may be tested in the same way except that regression should include a set of explanatory variables which would define the steady-state growth path

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