

Growth, Regional Disparity and Convergence Clubs in India: A Sectoral Level Analysis and Decomposition

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Among the large developing and transitional economies, India's political and geographic structure makes it one of the most interesting cases to test the convergence divergence problem in growth theory. Capital accumulation is confirmed or not. In this paper, we examine the convergence-club debate in the context of Indian economy. Our approach is motivated by two important finding in growth literature: first, Non-convex growth models unlike the neoclassical Solow-Swan model can display poverty traps, where economies with low initial incomes or capital stocks converge to one steady state level of per capita output, while economies with high initial incomes or capital stocks converge to a different steady state. The empirical method that we employ in this paper helps us to highlight non-linearities and multiple equilibria in growth. Secondly, the notion of convergence in growth literature, is structured by the relationship between initial conditions and the long term output. In empirical research, it is important to distinguish between parameters of the initial conditions and parameters of structural heterogeneity. The steady state effect of the initial conditions implies the existence of convergence in clubs while the steady state effects of structural characteristics do not. By using the Classification and Regression Tree Method (CART) of Breiman et al (1984) and subsequently advanced by Loh (2002) we tried to overcome the limitation mentioned above and endogenously determine clusters of states having same initial conditions.

Applied to the income variance of a cross-section of economies, the procedure approximates the catch-up process as a union of piecewise linear functions, where observations are grouped by initial conditions. In each club, the cross-section variance of per capita incomes is minimum. The clusters are assessed by minimization of the cross-section variance, depending on an exogenous variable: the past incomes per capita. Hence, we can take account of the past influences of the economic conjuncture on the current richness gap between economies. If we consider this cross-section variance over time, it amounts to studying the convergence of countries in clubs. As we study convergence at time t , as well as over time, we can know if economies catch-up over time. At any fixed time t , our method assesses the number of clusters, which States belong to which club. It gives the cross-section mean and variance in each club. The analysis gives information on: 1) How the number of States in clubs changes (number of clusters and number of States in clubs) 2) How the average income of clubs varies over time, 3) Convergence in club 4) How the regions move from one club to another between years. We use this method to study the convergence of income for the Indian states for the period 1960-2007. The control variables are

the past values of per capita income of the States and the initial condition will be the value of real per capita GDP at the beginning of the period. From 1970 to 2007, we obtained mainly two clubs Rich(R) and Poor (P). For few years we also have a transitory (T) club.

Regarding the dynamics of movement of the states we find that between 1983 and 1990, Andhra Pradesh, Karnataka, Kerala leave the poor club and create a transitory club which reaches the rich club at the end of the period. This progress completely collapses between 1991 and 1993. All of them fall back in the poor club in less than 3 years, probably due to the balance of payment crisis in 1991. After 1994, Andhra Pradesh, Karnataka and West Bengal start a 6 years process to catch up with the rich club and from 2000 to 2007; the composition of the clubs is constant except for West Bengal that falls back in the poor club in 2006. From 1984 to 2007, the splitting variable is SDP of the previous year except for 1993 to 2000, where the variable is SDP in 1966! This striking result shows that even after 30 years, the income of the beginning of the period was still the key factor for explaining the distribution of relatively recent income. It also exhibits that, for 30 years, very few movements between states have occurred.

We have also divided the income of one state by the average of all others'. This methodology also allows to study polarization. It is similar to considering that India has a natural growth rate and to see which states benefit from it. From our analysis we can distinguish two periods. From 1970 to 1988, for each state, the association to a club is constant through the years, apart from Kerala and Tamil Nadu that fall from the rich club to the poor which shows a decrease of the relative income for those states. However, in the period 1989-2007, the size of the transitory club decreases year by year. Apart from West Bengal, all the states leave the transitory club. Rajasthan and Madhya Pradesh fall into the poor club, whereas Andhra Pradesh, Karnataka, Kerala and Tamil Nadu reach the rich club. This exhibits a very strong polarization effect. In 2007, states are organized into a bipolar world, the rich and the poor and the transitory club has completely vanished.

Finally the paper also decomposes the convergence across the clubs into contributions from sectoral productivity growth and contributions from employment shift across sectors. While productivity growth in services and agriculture contributed significantly to convergence in the states in poor clubs, and the contributions from employment shift and productivity growth in manufacturing are statistically insignificant, for states in rich clubs we find that the productivity growth in services, manufacturing and the contribution from employment shift played a significant role. For transitory clubs it is productivity growth in the services, manufacturing and employment shift that explains convergence.

References

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