Convergence in Income Inequality

Jiyoung Chae
Department of Economics, University of Illinois at Urbana-Champaign

Introduction

The idea of convergence is based on the neoclassical growth model and postulates that per capita income in poor regions will eventually converge with that in rich regions. Since the beginning of the 1990s, numerous studies testing convergence in average incomes across regions have been conducted. However, Benabou (1996) noted that, instead of focusing on the average income levels, it is possible to estimate the convergence of entire distribution of income. This proposition implies that regions with similar fundamentals tend towards the same distribution of income.

The purpose of this paper is to test income inequality convergence among the states in the US. A cross-section of 49 states is analyzed for the period from 2007 to 2012 and income inequality is measured by the Gini index. In order to identify possible spatial dependence of the states, spatial econometric methods are applied.

Method

• Beta Convergence

This study applied common cross-sectional OLS model with annual average growth rate in Gini index as the dependent variable and the Gini index in the initial year as the explanatory variable.

\[ \frac{1}{T} \ln \left( \frac{G_{iT}}{G_{i0}} \right) = \alpha + \beta \ln(G_{i0}) + \epsilon_i \]

where \( G_{i0} \) is the Gini index in the initial year in state \( i \), \( T \) is the number of years in observation period, \( \alpha \) and \( \beta \) are the parameters to be estimated, \( \epsilon_i \) is the error term.

• Spatial Dependence

This study also used the spatial error model and spatial lag model to explain the spatial dependence among the states.

Spatial Error Model (SEM)

\[ \frac{1}{T} \ln \left( \frac{G_{iT}}{G_{i0}} \right) = \alpha + \beta \ln(G_{i0}) + \epsilon_i \quad \text{with} \quad \epsilon_i = \lambda W \epsilon_i + u_i \]

where \( \lambda \) is spatial error coefficient, and \( W \epsilon_i \) is the \( i \)-th element of the vector of the weighted error of other states.

Spatial Lag Model (SLM)

\[ \frac{1}{T} \ln \left( \frac{G_{iT}}{G_{i0}} \right) = \alpha + \rho W \ln \left( \frac{G_{iT}}{G_{i0}} \right) + \beta \ln(G_{i0}) + \epsilon_i \]

where \( \rho \) is spatial autocorrelation coefficient, and \( W \ln \left( \frac{G_{iT}}{G_{i0}} \right) \) is the \( i \)-th element of the vector of the weighted growth rates in Gini index of other states.

Results

The scatter plot shows a negative relation between the annual average growth rate of Gini index and the initial Gini index and suggests inequality levels across the states converged over a period of time.

Conclusions

This paper investigates the convergence in income inequality across the states in the US. The results indicate that during 2007 and 2012 inequality converged across the states, that is, inequality decreased in highly unequal states and increased in highly equal states. However, there is no evidence of spatial dependence for levels of income inequality.

As more data becomes available, the next step would be to estimate a panel model and perform additional convergence tests such as conditional convergence.

R | E | A | L
REGIONAL ECONOMICS APPLICATIONS LABORATORY
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN