

DESCRIPTION FOR THE GENERAL PUBLIC

The analysis of economic growth is one of the most important problems considered in modern economies. One of its aspects is the real economic convergence, commonly known as the catching-up effect. It is vital for the poorer countries to determine the factors of economic growth and the possibilities of catch-up with the richer, more developed countries. This knowledge can influence the policy-makers' decisions, which allow to speed-up the convergence process or counteract the unwanted effects. The aim of this project is to propose the new empirical method of analyzing the phenomenon of real economic convergence as well as to check in detail the effectiveness of the adopted approach. Implementation, computer simulations and scientific description of results of empirical analysis, all are an important part of the research. The key concept of the proposed method, which is innovatory considering its application, is the integration of the existing broad theory of economic convergence with the new sophisticated tool known as the hidden Markov model (HMM).

The scientific plans of this project are very ambitious. In the research, we focus on the integration of two large tasks. Firstly, we carry out a multi-dimensional analysis of income-level equalization and business cycle synchronization on the basis of the wide range of different definitions of convergence, including the conventional types (beta and sigma) and less explored ones (gamma, rho, and stochastic convergence). Secondly, we conduct a wide mathematical and econometric modelling process, covering the classical structural models of economic growth, more advanced computationally quantitative methods, e.g. Bayesian averaging, and mainly the hidden Markov model procedure. HMM will be used, among others, to identify turning points (peaks and troughs) of the catching-up process. These turning points will be treated as structural breaks in checking time variability of the other concepts of income-level convergence, and they will justify the application of different models (from the same or different class) to the period before and after a given turning point.

The holistic plans of the research, including comparative view of different types of real economic convergence, wide range of computational methods and algorithms, as well as expanded empirical analysis and computer simulations, will definitely systematize and greatly enrich the current state of knowledge in the field of economic sciences, especially in terms of the theory of business cycles and economic growth, the empirics of convergence, and applications of hidden Markov models.