Some mathematical models of economic growth with accumulation of human capital

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Abstract

In the introductory part of presentation a brief survey of the research of mathematical models of economic growth theory which take into consideration the processes of accumulation of physical and human capital is given.

In the first part of presentation a general mathematical model of economic growth which generalizes similar models including the well-known Lucas's classical one is described. For this model two traditional optimization problem statements (problems of a social planner and a com-petitive equilibrium) are described. The generalized model of economic growth is investigated using numerical-analytical methods. Qualitative features of balanced growth paths have been studied for the typical parameter values of real economic systems. The model has been found to have an indeterminacy effect at fairly realistic parameter values.

The second part of presentation is devoted to a generalization of K. Arrow's classical model of economic growth taking into account human capital accumulation through learning-by-doing. The general optimal problem covering the main traditional problem settings (the social planner and competitive equilibrium) is formulated. At the first step of research we consider a limiting version (in the style of the article of Greiner A.) of the general mathematical model. At the second step using numerical and analytical methods we study the general version of the mod-el (for the typical parameter values of real economic systems).

In conclusion some generalizations of the results obtained and new formulations of problems are described.