

## The algorithm solution of the problem of optimal control in a dynamic one-sector economic model with a discrete time based on dynamic programming method

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*Abstract:* In this paper we study a new formulation of the optimal control problem in a dynamic single-sector economic model with discrete time. In the task, the states are the values of the specific capital, that is, the total amount of capital related to the unit of labor resources. The role of management is played by a parameter representing the proportion of the specific product produced that is directed to investment. The target functionality is the sum of two components. The first one expresses the specific consumption accumulated during the evolution of the system. The second is expressed as a given function of the value of the specific capital at the final point in time and describes the level of technological development in the system formed at that moment. The main limitation is the dynamic ratio for the specific capital, describing its change under the influence of management. The initial state in the system is assumed to be fixed. The study is based on the dynamic programming method. The Bellman equations for the problem are obtained. Based on the well-known theoretical assertions, it is established that the sequence of controls satisfying the Bellman equations is optimal. An algorithm has been created and described in detail that allows one to solve the Bellman functional equations numerically and find a sequence of optimal controls for the problem posed.

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