Modeling Investments in Human Capital in the Russian Federation under Uncertainty and Heterogeneous Discounting by Individuals

In the last decade, the problem of stimulating economic growth has been particularly acute for the Russian economy. Government organizations are actively developing programs aimed at stimulating economic growth, labor productivity, human capital accumulation and increasing the welfare of citizens. In the current geopolitical and economic conditions, the accumulation of human capital in Russia is of particular relevance. In this study, the problem of human capital accumulation in Russia is studied on the basis of a model of 60 overlapping generations with heterogeneous individuals in a number of parameters and uncertainty about future income.

Modern general equilibrium models describing the sector of educational services are built, as a rule, on the assumptions about the homogeneity of the preferences of individuals, including the homogeneity of the discounting parameters. In this study, it is assumed that individuals are heterogeneous in a number of parameters, which include the degree of risk aversion, the individual parameter of intertemporal discounting, and the level of ability. The main emphasis in the developed model is on the introduction of heterogeneous discounting by individuals and the description of the uncertainty of future income in terms of heterogeneous discounting and heterogeneous risk aversion.

The paper analyzes the economic policy of the state in the field of higher education on the basis of a general equilibrium model with intersecting generations for the Russian economy, which describes the interaction of the population (family), the state, and the educational institution.

**Results:**

* The decision on the choice of the level of education by individuals depends not only on the prevailing macroeconomic conditions, but also on the individual characteristics of individuals, which include learning ability, risk attitude and individual discount factor. The effectiveness of the policy pursued will depend on the tolerance of individuals to risk, as well as the degree of their bias towards the present. If individuals have a short planning horizon and they value current consumption more, they will have low incentives to invest in human capital. If individuals are risk averse, their incentives to pursue higher education are lower the higher the dispersion of their wages that they will receive upon graduation. Incentivizing such individuals to pursue higher education would require spending more to increase the proportion of people with higher education in the economy.
* The study considers 3 options for economic policy aimed at stimulating the accumulation of human capital. The first is the different distribution of a given amount of funds for educational subsidies. In the base scenario, the subsidy covers 100% of higher education costs. When covering 75% of expenses and issuing subsidies to more individuals, the share of people with higher education in the economy increases by 1.2 p.p., with a 50% subsidy - by 2.5 p.p. The second is an increase in the number of subsidies financed by lump-sum taxes. A doubling of subsidies increases the share of people with higher education in the economy by 7.5 p.p. The third is financing by changing the tax rate. A 2-fold increase in subsidies can be achieved by increasing the income tax rate to 13.7%, the consumption tax to 20.4%, and social contributions to 30.35%.
* In the baseline scenario, an increase in the proportion of people with higher education does not affect the rate of economic growth. In the alternative scenario, an increase in the share of people with higher education by 10 p.p. increases growth rates by 1 p.p. Under these conditions, a 2-fold increase in subsidies for education leads to an increase in the share of people with higher education by 3.5 percentage points, to an increase in growth rates from 1% to 1.3%.