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STOCKTAKING THE INSTITUTIONAL FEATURES OF REGIONAL ECONOMIES WITHIN THE DSGE MODEL

The growing importance of the regions of the Russian Federation as leading economic entities competing for financial and labor resources necessitates the development of adequate scenarios for their socio-economic development, taking into account fiscal and monetary destabilizing factors. Inconsistent business cycles in various constituent entities of the Russian Federation and inflation differentials, partially due to industry specifics [1], obstacles to the redistribution of resources between heterogeneous regions, as well as imperfect mechanisms for adjusting relative prices, which do not allow economic agents of the territories to respond optimally to shocks, lead to losses in the welfare of the regions [2].

The construction of realistic development scenarios that take into account regional characteristics is possible on the basis of the toolkit of dynamic stochastic general equilibrium models (DSGE-models), which form the foundation of modern macroeconomics and are widely used to study the aggregated parameters of the national economies development. Microeconomic substantiation is used here as the theoretical basis for such an analysis, within which the dynamics of the economic system is the result of some optimization activity of economic agents. At the same time, models of this class, describing socio-economic processes at the level of the regional economy, are rather narrowly represented in modern studies [3, 4, 5]. Thus, the scientific problem to be solved by this study is the development of a systematic approach to managing the development of the constituent entities of the Russian Federation based on the implementation of DSGE-models.

This paper presents a mathematical formulation of the problem of studying socio-economic processes at the level of the regional economy using the DSGE model, which includes the following sectors of the economy: the central bank (at the macro level) pursuing an inflation targeting policy, enterprises, households, the state (regional authorities), external world.

As it is known, the DSGE model in the simplest case includes three key relations: the dynamic IS equation, the New Keynesian Phillips equation, and the Taylor equation [6]. The first reflects the aggregate demand, the second is constructed for the aggregate supply, the Taylor equation describes the equilibrium in the money market. The system of these three ratios is a tool for analyzing the transmission mechanism of monetary policy implemented by the Central Bank, and allows one to quantify the response of model variables to an exogenous increase in the interest rate by the central bank. At the same time, both devaluation expectations and interest rate arbitrage can act as the drivers of the exchange rate in this model.

To model the real sector of the economy in the short run, the Cobb-Douglas function without capital is used. The production function sets the GDP on the supply side. On the demand side, GDP is defined through the basic macroeconomic identity as the aggregate demand of different sectors of the economy.

The fiscal regulator in the model is represented by the regional government implementing the budget rule with feedback between expenditures and GRP.

A feature of the proposed model is the consideration of territorial characteristics through the institutional component represented by human capital (health preservation). To do this, a variable is added to the budget constraint of the regional government, reflecting government spending on health care. This modification has an impact on the production function of the territory (by

destabilizing the labor market by the sick people), as well as on the balance of the regional government budget (by increasing the burden on the health care system).

To emphasize the regional aspect, it is assumed that households own the factors of production and directly invest in fixed assets of the real sector. We do not impose restrictions on the ability of households to save and credit.

On the basis of the developed model, the response functions for shocks of exogenous variables are constructed (the scenario is the redistribution of budget funds in favor of health care). The reallocation of budget funds in favor of health care increases the total factor productivity and also increases the number of active households. This, in turn, stimulates labor supply and consumption, which contributes to a positive output gap.

The novelty of the proposed DSGE-model is to take into account the institutional characteristics of the constituent entities of the Russian Federation by highlighting the budgetary sector in the model, which includes the differentiation of expenditures on health care and public procurement. Thus, the adequacy of the model to the modern realities of the functioning of the national economy as a set of heterogeneous regions increases.

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