

Econometric evaluation of the impact of economic complexity on the income inequality in Russia's regions

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Identifying the factors of growing income inequality in Russia's regions is of interest to both researchers and government. Special attention should be paid to the question of how the sanctions of 2022 will affect inequality in the regions, depending on involvement in international trade. One of the possible approaches to do this is regions' economic complexity.

Economic complexity is increasingly gaining popularity as a predictor of inequality [10]. To measure the complexity of some economy, Hidalgo and Hausmann [7] proposed the economic complexity index (ECI), which is calculated as the complexity of the exported goods with Revealed Comparative Advantages. The idea of this measure is that sophisticated economies are diverse and export products that have low ubiquity as only a few diverse countries can produce these sophisticated products [6]. There are a few attempts in the literature to assess the impact of ECI on income inequality, and the results of these studies are quite controversial. The studies [5, 6, 9] have shown that more complex economies tend to have fairer income distribution. The logic of this result is as follows: higher economic complexity implies more diverse and unique production opportunities, which allow to develop highly sophisticated industries, resulting in a relatively flat occupational structure, dispersed skills and knowledge and, consequently, less income inequality by increasing occupational opportunities for workers [6]. A number of other studies [3, 4] have found that ECI will contribute to the growth of income inequality. To become more complex, an economy needs to focus on products which require higher skills, and therefore the demand for high-skilled labor is growing. As a result, while the incomes of skilled workers are growing, low-skilled and unskilled workers are at a disadvantage, which leads to an increase in the income gap [4].

The purpose of this study is to assess the impact of economic complexity on income inequality in Russia's regions. The economic complexity index is not calculated by Rosstat and other Russian statistical services, which greatly limits the available research methods. The regional ECIs data in 79 regions for 2013 and 2015 were collected from the works [1, 2]. The ECIs for 58 regions in 2020 are also available on the website [10]. Due to data limitations, OLS was chosen as the research method to assess 3 cross-section models. The Gini index and income shares of quintile groups of the population were used as indicators of income inequality. Socio-economic indicators were added as controls: GRP per capita and GRP per capita squared, level of high education, social expenditure, unemployment, inflation, urbanization and trade openness.

For all models, estimates show that in regions with more complex economies, the level of income inequality was higher. Other things being equal, an increase in the ECI by 1 increased the Gini index by 0.013 in 2013 (0.017 in 2015 and 0.018 in 2020). At the same time, the inclusion of indicators such as level of higher education and social expenditure will reduce the positive impact of economic complexity on income inequality. This effect is due to the fact that better education and social benefits (for example, professional retraining due to the state program)

can help some poor workers better adapt to the labor market changes and also benefit from the higher economic complexity. This result is consistent with the previous work [4] obtained on cross-country data.

There are several possible explanations of such impact in Russia's regions. Firstly, according to the theory of skills-based technological change, as the economy becomes more complex, only a small group of high-skilled workers will benefit. In case of Russia, this theory is well illustrated by IT market, which is experiencing a shortage of skilled workers, and therefore salaries in this industry are significantly higher than the national average, what contributes to the growth of inequality. Secondly, the level of economic complexity also reflects the potential for export diversification of the economy [2]. There is an opinion [8], that there is an inverse U-shaped relationship between export diversification and income inequality. Given that the ECIs for most Russia's regions were negative in 2020, we can assume that the regions have not yet reached that critical level of export diversification, after which the economic complexity can help mitigate income inequality. Thus, one of the possible consequences of sanctions may be a decrease in the economic complexity of the regions, which, at first seem, will mitigate income inequality, but this effect will be associated with technological lag and a decrease in demand for skilled labor.

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