

Social Investment: Measuring the Effect on the Population Welfare of the Russian Far East

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Abstract— The article studies expenses of budgets on education, healthcare, social policies, housing and public utilities, as social investments that contribute to the population welfare. Using model constructs built on the base of dynamic and panel data, the authors received the estimates of effect of social investments on parameters of population welfare in the Far East in 2000-2017. As part of traditional approach to quantity analysis of regression dependence both aggregate (macro-region) and local (disaggregated by territories) indicators are considered. The article shows that the relation between expenses on healthcare and indicators of population welfare becomes statistically significant only when taking into account spatial distribution, which means that the effects concentrate in certain territories. The article establishes that in case of counting the expenses by territories, the effect of social investments on the changes in population welfare is much lower than when measuring it using aggregate social investments in the whole region. It is shown that aggregated measurements of effects from social investments produce inflated expectations. Increasing state expenses on population welfare in the region makes sense only when taking into account spatial and industrial distribution of budgetary resources.

Keywords— *Budget Expenses, Social Investments, Population Welfare, Differentiation, Far East.*

1. INTRODUCTION

The irregularity of economic development of the regions, shown in differentiation of indicators of social development of the territories, leads to disturbance of socio-economic balance and recreates the inequality of population welfare [1-4]. One of the main tools that lessens objective economic differences and spatial heterogeneity and provides socially acceptable living conditions in every region of the country is social investment or the expenses of state budget on the development of social spheres of economic activity (education, healthcare, culture, social policies, housing and public utilities).

According to theoretical notions, the act of spending budgetary means is the state realizing market exchange of tax income for social utilities that provide the necessary vector of social and economic progress of a society [5-9]. At the same time, the expenses of providers of socially significant services are covered by individual payments of consumers and respective budget allocations [10]. The latter are seen "not as gratuitous help of a patron, but as social investment into human capital" [11, pp. 49-52]. Since both foreign and

Russian literature have different approaches to defining "social investments", which can be seen as "a form of corporate social responsibility", "investment of financial resources into solving social issues expecting revenue from them" [12], the authors of this work view social investment solely as a process of spending budgetary means on the development of social sphere of economic activity that provides the growth of human capital. As an indicator of said growth, the authors use the level of welfare, measured by population income.

Getting reliable measurements of effects of state budgetary policy aimed at the growth of population welfare is an important task both theoretically and practically. Identification and quantity analysis of changes of spatial and industrial indicators, induced by state efforts in the way of financial flows, allow judging the effectiveness of taken measures by comparing the goals and the results and define possible ways of correcting them if necessary. At the same time, the quality of conclusions mainly depends on the methodological base that was used to receive them. The formal conditions of authenticity of output data is the achievement of at least two steps: 1) proving the relation between changes and applied policy; 2) receiving the estimation of correlation between changes in budget expenses and target indicators.

This task is especially important in the Far East – the macro-region that is currently in the spotlight of the country government [13]. The result of a special status of the Far Eastern Federal District, which includes 9 federal subjects (Sakha Republic, Kamchatka Krai, Primorsky Krai, Khabarovsk Krai, Amur Oblast, Magadan Oblast, Sakhalin Oblast, Jewish Autonomous Oblast, Chukotka Autonomous Okrug), is related to provision of advanced economy growth rates. The key stake is on the factor of economic dynamics – human capital. The growth of volume and quality of the latter, according to the program, should contribute to the improvement of quality of life of the population of the region.

2. BUDGET EXPENSES AND POPULATION WELFARE OF THE FAR EAST: INITIAL STATE

Monitoring of socio-economic situation in the Far East shows that state measures and mechanisms used to achieve them for now have little influence on the changes of living conditions in the region, worsened by internal and external shocks [14-16]. Real population income decreases third year

in a row (–1.1% in 2015 against 2014; –6.5% 2016 against 2015; –1.7% in 2017 against 2016) [17]. The share of poor population (income below subsistence level) in 2014-2016 increased from 14.4% to 15.6%, which is 2.1% higher than country average (13.5% in 2016). The migration drain of population continues (–154 thousand people in 2011-2017). Among the main factors that motivate the population to leave are high cost of living, low wages, dissatisfaction with quality and availability of social services [18]. In other words, low indicators of quality of life create a negative representation of welfare level in the Far East [19].

At the same time, one of the main directions of institutional changes that happened in the country and regional economy was the targeted inflation of social sector with finance resources out of budgets, which should have contributed to the rapid modernization and innovation of the sphere that creates socially significant services for the population.

In 18 years, the social investments (expenses) out of consolidated budgets of the 9 subjects of the Far Eastern Federal District increased 13.8 times – from 40.7 billion rubles in 2000 to 562.8 billion rubles in 2017. The share of social investments in aggregated expenses of all consolidated budgets of the region increased from 59.3% in 2000 to 70.6% in 2017 [20]. The 5 northeastern subjects of the Far Eastern Federal District are leaders in real social expenses of budgets out of all 85 Russian subjects: Chukotka Autonomous Okrug, Sakha Republic, Sakhalin Oblast, Kamchatka Krai, Magadan Oblast; which is the result of objective expense-increasing factors [21].

More than 5 trillion rubles were invested into social sphere, including housing and public utilities, as a whole in 2000-2017 out of consolidated budgets of the Far Eastern Federal District's subjects. The expenses aimed at the realization of certain social goals in consolidated budgets of Far Eastern subjects of Russia for the last 5 years have shown positive dynamics: the annual average rate of social policy expenses in 2012-2017 was 105.9%, expenses on education – 101.6%, on housing and public utilities – 100.9%. Despite this, the statistics of real population income of the macro-region, as shown above, has a negative trend.

This situation begs the question: do social investments (budget expenses) have effect on the population welfare in the Far East?

3. INFORMATION BASE AND METHODS OF RESEARCH

To measure the effect of social investments on the parameters of the population welfare in the Far Eastern Federal District the authors used the methods of econometric modelling. Particularly, regression analysis of model construct of linear type (1), which allowed getting quantity estimations of changes of population welfare, induced by the changes of state expenses.

$$Y_{it} = AX_{it} + B \quad (1)$$

where Y – parameters of population welfare; X – social investments by directions; i – federal subjects of Russia

forming the macro-region, $i = 1..9$; t – time, $t = 2000..2017$; A, B – sought coefficients.

Coefficient A shows how much on average the population welfare is going to change with one-tome change of social investments. Coefficient B shows the effect of other factors, apart from state expenses, that contribute to the level of population welfare of the macro-region.

As an indicator of the population welfare, the authors are using monetary income per capita (rubles), as social investments directions – social sphere as a whole and by components: education, healthcare, social policy, housing and public utilities. The comparability of respective statistical data was ensured by transferring the latest into prices of the basic year – 2000.

Analysis was conducted by using organization of dynamic ($i = \text{const} = \text{Far Eastern Federal District as a whole}$), and spatial and dynamic (panel) structure of input data. In case of the latter, apart from the models of general regression (1) measured by using the weighted method of least squares, the authors measured their modifications – models with fixed elements specific for objects observed – 9 Far Eastern federal subjects (2).

$$Y_{it} = AX_{it} + C + B_i \quad (2)$$

where C, B_i – sought coefficients.

The economic sense of C and B_i coefficients is in the differentiation of factors, distinct from the social investment but contributing to the population welfare in the macro-region, into general (characteristic of all Far Eastern federal subjects) and specific (characteristic of separate subjects) respectively.

Thus, as part of the conducted study, the authors measured 30 relationships: 20 of type (1), 10 of type (2), using econometric pack for “Econometric Views” toolset.

4. RESULTS OF THE STUDY

The results show that 93% of constructed relationships are characterized by statistical significance (have relatively high values of determination coefficients R^2 , F, and t-statistics). This can mean either of two things. The first explanation is that population welfare and social investments, while having similar (in direction) trends of their changes in time, have no dependent relationship (are not divided into primary and secondary – exogenous and endogenous – variables). Second – the changes of population welfare are the result of state expenses changing, in other words, there is a strict functional relationship between the respective variables, with social investments being an exogenous variable, population welfare – endogenous.

As part of the current study, the authors name accounting social expenses of main sources that form population income as an argument for existence of functional relationship between investments into social sphere of the Far East and the population welfare of the macro-region (apart from the similarity of dynamics of values of respective variables). They are social workers' wages, their pensions, benefits,

compensation payments, which are included into social items of budgets.

Accepting the hypothesis of linear relationship between social investments and the population welfare of the Far East, the authors note the growth of quality of respective functional relationships when moving from the models of general regression built on the base of dynamic and panel data to the models with fixed effects (increased values of determination coefficients R², F, and t-statistics). At the same time, when taking into account coefficients with welfare indicators (A) the values decrease.

When looking at this situation from the investment point of view, the above means that “aggregation” of the studied objects from the level of 9 federal subjects to the federal district itself distorts the estimations of effects of the former on the dynamics of population welfare almost 2 times: the change of social investments into respective sphere by 1 ruble according to model constructs without accounting for spatial heterogeneity changes population welfare by 5.33 rubles; when taking spatial heterogeneity into account – only by 3.34 rubles. This creates an illusion that social investments have strong effect on the growth of population welfare of the region as a whole. When in reality, the effect differs strongly when looking at every subject of the Far Eastern Federal District separately.

The quantity analysis of model constructions with fixed elements (highlighting factors of location) allowed ranking the Far Eastern subjects of Russia depending on the contribution of social investments into the formation of population welfare level. Thus, average volumes of social expenses in every federal subject of the macro-region contributed to the formation of average level of welfare in the latter as following (table):

Table. Contribution of factors to the formation of population income in the Far Eastern federal subjects of Russia, %

Federal subject	Social investments	Location factors
Sakha Republic	78.2	21.8
Kamchatka Krai	68.2	31.8
Primorsky Krai	32.4	67.6
Khabarovsk Krai	40.6	59.4
Amur Oblast	56.3	43.7
Magadan Oblast	65.0	35.0
Sakhalin Oblast	57.5	42.5
Jewish Autonomous Oblast	56.8	43.2
Chukotka Autonomous Okrug	99.9	0.10

The effect of social investments on the welfare level of Far Eastern subjects of Russia was dominating compared to location factors in all regions except for Primorsky Krai and Khabarovsk Krai, where social investments contributed only 32.4% and 40.6% respectively to the volume of income per

capita. Social investments had the strongest effect on the level of population welfare in Chukotka Autonomous Okrug – 99.9%. This is explained by the existing structure of economy and population employment influencing the formation of population income. The northeastern subjects of the Far East, where the potential of labor markets is limited to traditional kinds of economic activity and population employment in social sphere is high, are characterized by high level of dependability of population welfare on the volumes of social investments.

The calculations show statistical insignificance of 7% of model constructions that show relationships between social investments and population welfare when the former are directed into healthcare. The relationship between healthcare expenses and welfare indicators is only statistically significant when taking into account spatial distribution that shows concentration of effects in certain territories.

5. CONCLUDING REMARKS

The analysis and estimations show that when ignoring spatial heterogeneity inside the Far Eastern Federal District (using it as a “point” without internal space) the efficiency of budgetary policy aimed at the growth of population welfare is significantly higher compared to viewing the Far East as a multi-regional system. This is one of the main reasons for emergence of fallacies of high efficiency of large-scale financial contributions into social sphere. It is highly probable that when studying budget expenses at even lower level of local budgets the results will be ambiguous. In any case, the results show that taking into account spatial heterogeneity of the macro-region is a necessary requirement to receive reliable estimations that allow interpreting the effects of directing budget expenses of the Far Eastern subjects on social goals as correctly as possible. The effect of budgetary policy on formation and growth of population welfare depends on not only the industrial direction but also their spatial distribution

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