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Two-parameter model of optimization of the progressive taxation system and its applicability

Modelo de dos parámetros de optimización del sistema tributario progresivo y su aplicabilidad

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ABSTRACT

The work aims to develop a model of income taxation that allows strengthening the fiscal effect of personal income tax and reducing the differentiation of income levels of different segments of the population, as well as assessing the impact of the proposed model on social inequality in Russia. To achieve this goal, a special two-parameter model of progressive income tax was developed, reflecting the result of studying the features of modern Russian taxation in the context of personal income tax. The key advantage of the developed tax model is the ability to assess social differentiation (by income category) in a pairwise subdecile breakdown, which allows the state to conduct a more balanced policy concerning each of the income groups participating in the study, which can be expressed, for example, in granting special tax preferences to decile groups that need it.

Keywords: social equality; personal income tax.

RESUMEN

El trabajo tiene como objetivo desarrollar un modelo de tributación de la renta que permita fortalecer el efecto fiscal del IRPF y reducir la diferenciación de los niveles de renta de los distintos segmentos de la población, así como evaluar el impacto del modelo propuesto sobre la desigualdad social en Rusia. Para lograr este objetivo, se desarrolló un modelo especial de impuesto sobre la renta progresivo de dos parámetros, que refleja el resultado del estudio de las características de la tributación rusa moderna en el contexto del impuesto sobre la renta personal. La ventaja clave del modelo tributario desarrollado es la capacidad de evaluar la diferenciación social (por categoría de ingresos) en un desglose por pares de subdeciles, lo que permite al estado llevar a cabo una política más equilibrada con respecto a cada uno de los grupos de ingresos que participan en el estudio, que puede ser expresada, por ejemplo, en el otorgamiento de preferencias fiscales especiales a grupos deciles que lo requieran..

Palabras claves: igualdad social; impuestos personales.

1. INTRODUCTION

A retrospective look at the issue of fair taxation shows that two fundamentally different approaches to the interpretation of justice can be distinguished. The first approach corresponds to the economic and political realities of the 18th century when Smith (2002) first clearly formulated the understanding of fair taxation as a unity: 1) the universality of taxation and 2) the proportionality or solvency of taxation. Subsequently, this approach was called the principle of horizontal justice. According to the principle of horizontal equity, taxpayers with the same economic potential should bear the same tax burden (Alan et al., 2010; Kosov et al., 2016). In the 20th century, the principle of horizontal justice was replaced by the principle of vertical justice. According to this principle, taxpayers with different economic potential should bear different tax burdens. The principle of horizontal equity is expressed in the proportional method of taxation (Harrison, 2001; Koson, Hawkins, Mayhew, 2016; Hindriks, 2001). The principle of vertical equity is implemented in progressive taxation (Bruce, Deskins, 2012).

When studying the controversial issue of the need to introduce a progressive income tax in the Russian Federation, two aspects are traced. Firstly, many economists note that in modern conditions, fair taxation of individuals is more consistent with the principle of vertical equity (Benhabib, Nishimura, Venditti, 2002; Chervinskaya, 2020)., i.e., a gradual, step-by-step increase in the tax rate on personal income with an increase in the level of income of an individual. Secondly, many economists also note that the sharp introduction of the principles of vertical equity, which will be expressed in the introduction of a progressive tax scale (Klier, Linn, 2015), is associated with significant risks associated with the growth of the shadow sector of the economy, the withdrawal of funds to offshore companies and many other factors (Zemlyakova, 2018; Akhmadeev et al., 2019).

A significant number of works on fair taxation have been written in Russian scientific practice. However, as such, comprehensive studies on this issue have not been carried out. Nevertheless, many economists and politicians put forward the opinion that it is necessary to change the existing system of taxation of individuals (Slepov et al., 2017; Sigarev et al., 2018). However, their proposed measures are targeted in nature, aimed at changing the legislation, without taking into account the potential risks and consequences of the implementation of such measures. Such questions require in-depth scientific research, which will allow determining the possible risks and consequences of a sharp change in the established tax system (Cullen; Gordon, 2007; Bykanova et al., 2017).

Research in the field of developing an optimal model of taxation of personal income will go in two alternative directions: 1) development of a model based on the scale of progressive income tax rates (Auerbach; Feenberg, 2000); 2) development of a proportional model for the taxation of personal income with elements of hidden progression based on the effective tax rate (Pierce, Schott, 2016). The introduction of a non-taxable minimum and the improvement of the personal income tax deduction system can serve as tools for ensuring hidden progression and strengthening tax fairness based on the redistribution of income of various segments of the population (Slepov et al., 2019).

2. METHODS

As mentioned earlier, the introduction of a progressive scale of taxation of personal income requires a detailed analysis. To analyze the need to implement a progressive scale of taxation in the Russian Federation, it is necessary to use a special model that includes two parameters.

The first parameter is the fund ratio. It is responsible for the social dimension of the issue of implementing such critical changes to the tax legislation in the country. The fund ratio is an integral part of the group of income differentiation coefficients and describes how many times the average level of monetary income

of the 10% of the population with the highest incomes exceeds the average level of monetary income of the 10% of the population with the lowest incomes (Morozova et al., 2020; Lehoux et al., 2019).

The second parameter is the growth of tax revenues. It reflects the effect for budgets of different levels (personal income tax is 85% in the budget of the subject of the Russian Federation and 15% in the local budget of the municipality where the income was received), which will be expressed in monetary terms.

The key idea of the scheme used is a two-way analysis of the consequences of the implementation of changes in tax legislation. On the one hand, the assessment of the social effect is carried out, on the other – the effect on budgets and the role of implementing changes in budget occupancy.

As part of the ongoing study, it was decided to use the funds' ratio since potential changes in taxation will affect decile groups IX and X, while the remaining decile groups will not be affected. This distribution of the effect is evidenced by the recent partial introduction of a progressive taxation system concerning incomes exceeding 5 million rubles, which, according to the Minister of Finance A.G. Siluanov, will affect only 1% of the working population in the country (Osipov et al., 2017; Kosov et al., 2020).

However, international practice shows a tendency that the introduction of the income tax rate also affects the decile group I, as the group that will receive the greatest tax preferences, in particular, the non-taxable minimum, tax benefits, and other support methods (Kotlikoff, Smetters, Walliser, 2007; Kosov et al, 2018).

The study determined that the use of the Gini coefficient (characterizes the degree of social differentiation) is not appropriate since 7 out of 10 (we can even say that 7.5 out of 10, since only the upper part of the IX decile group will be affected by the potential introduction of the progressive scale) will not be affected by potential changes in the taxation of personal income.

In this regard, it seems more justified to use the Rainbow coefficient (Grechaniy; Rodin, 2015), which is used to estimate the income ratio of the upper (IX) and lower (I) decile groups.

Let us take a closer look at all the dependencies used in the future. The initial value of the funds' ratio, i.e. before the introduction of the progressive personal income tax scale, is calculated trivially:

$$F_0 = \frac{D_X}{D_I}, \quad (1)$$

where $D_1$and $D_{10}$are the receipts of decile group I and decile group X.

The initial value of the tax revenue from the tax can be estimated using a simplified formula:

$$T_0 = aD - L \quad (2)$$

where D is the income received by the entire population; a – the basic personal income tax rate (13%); L – tax benefits (mainly tax deductions).

Then the coefficient of funds after the introduction of the progression in the personal income tax is calculated as:

$$F_1 = \frac{D_X^*}{D_I^*} \quad (3)$$

where D_I^*, D_X^* is the total income of decile group I and decile group X after the implementation of changes in the tax system (the introduction of a progressive rate).

The model used in the calculations assumes that the amount of tax preferences is zero since the value of the total tax benefits in Russia is not estimated.

In the simplest case, it is possible to ignore the tax deductions (V=0). Then the main effect has a new value (after the introduction of the progression) of the income of the decile group X D_X^* will be calculated by the formula:

$$D_X^* = (1-\alpha)(W_{max}L_X + \sum_{i=2}^{n} L_{X.i} \sum_{j=1}^{i-1}(1-\beta_j)(W_{X.j,max} - W_{X.j,min}) + \sum_{i=1}^{n}(1-\beta_i)(\overline{W}_{X.i} - \overline{W}_{X.I,MIN})L_{X.i} \quad (4)$$

where W_{max} is the maximum income at the base tax rate (α);

L_X– the number of decile group X;

$L_{X.i}$ – the number of the i-th subgroup of the decile group X;

β_j and β_i – the tax rate of the i-th and j-th subgroups of decile group X, respectively;

$W_{X.j,max}$ – upper bound of the income of the j-th subgroup of the decile group X;

$W_{X.j,min}$ and $W_{X.i,min}$ is the lower bound of the income of the i-th and j-th subgroups of the decile group X, respectively;

$\overline{W}_{X.i}$ – the average income of the i-th subgroup of the decile group X;

$$i = \overline{1,n}; j = \overline{1,n}; n = 5$$

The amount of tax revenue from personal income tax after the introduction of the progressive scale is calculated using the formula:

$$T_1 = \alpha[(D - D_X) + W_{max}L_X] + \sum_{i=2}^{n} L_{X.i} \sum_{j=1}^{i-1}(\beta_j)(W_{X.j,max} - W_{X.j,min}) + \sum_{i=1}^{n}(\beta_i)(\overline{W}_{X.i} - \overline{W}_{X.I,MIN})L_{X.i} \quad (5)$$

Given the formula (2) for V=0, the equation (5) can be written over as:

$$T_1 = T_0 + \alpha[W_{max}L_X - D_X] + \sum_{i=2}^{n} L_{X.i} \sum_{j=1}^{i-1}(\beta_j)(W_{X.j,max} - W_{X.j,min}) + \sum_{i=1}^{n}(\beta_i)(\overline{W}_{X.i} - \overline{W}_{X.I,MIN})L_{X.i} \quad (6)$$

For further analysis, it is necessary to evaluate these two parameters: the change in the fund ratio after the introduction of the progressive scale:

$$\Delta F = F_1 - F_0 \quad (7)$$

and the absolute and relative change in tax collections:

$$\Delta T = T_1 - T_0 \quad (8)$$

$$\lambda = \left(\frac{\Delta T}{T_0} - 1\right) * 100\% \quad (9)$$

The entered designations allow writing down the desired model for evaluating the results of the introduction of a progressive scale of taxation of individuals:

$$\lambda(\beta_1, \dots, \beta_n) \rightarrow max \quad (10)$$

$$\lambda(\beta_1, \dots, \beta_n) \rightarrow max \quad (11)$$

$$\beta_i \leq \beta_i^*, i = 1, \dots n \quad (12)$$

where β_i^* is the maximum allowable rates of the progressive personal income tax scale, which act as model constraints. As a rule, there are no formal restrictions on these rates, but there is empirical evidence about their reasonable values.

The formula (10) can be replaced with an equivalent one:

$$|\Delta F(\beta_1, \dots, \beta_n)| \rightarrow max \quad (13)$$

In this form, both formulas of the model are unidirectional, i.e., maximizing. To compare different scenarios, formula (10) and (13) can be aggregated into one by introducing weights ζ and $1 - \zeta$. Then the final model will take the form:

$$\zeta\lambda + (1 - \zeta)|\Delta F| \rightarrow max \quad (14)$$

$$\beta_i \leq \beta_i^*, i = 1, \dots n \quad (15)$$

The resulting model is of an optimization nature. However, given that no restrictions on the tax rate are used, the model can be considered a simulation, which allows for scenario analysis depending on the indicators used.

To compare the scenarios of implementing a progressive scale with the scenario of changing a flat scale, it is enough to estimate the tax charges for the second case using the formula:

$$T_1 = \alpha^* D - V^* \quad (16)$$

where α^* – the changed flat personal income tax rate.

The above formulas allow determining as accurately as possible the social and fiscal results of both scenarios with different progressive personal income tax scales, and scenarios of a simple change in the proportional scale.

3. RESULTS AND DISCUSSION

The calculation of the macroeconomic effect of the implementation of the new tax policy is very conditional, not claiming a high degree of accuracy, since the study is carried out with "broad strokes", based on average figures, which do not always reflect the real state of affairs in the economy. However, the task set in the current study is a comparative analysis of proportional and progressive tax scales, which requires accuracy in the calculations. In this regard, a special data correction mechanism was developed, which will smooth out the effect of "broad strokes", as well as form the basis for scenario calculations of the effects of changes in the system of taxation of personal income.

The first data block is information about the distribution of income of the population by income groups (based on the decile breakdown of the population). A separate indicator was also introduced, which is not calculated by the statistical service – the total income of the income group for 2018. This indicator is calculated as the product of the number of people in an income group (for all groups, 14.88 million people) and the income per person in this income group.

Table 1. Distribution of monetary income by population groups in 10%; 2018

Revenue group	Group income in the total income structure, %	People in the group, million people	The income per person in the income group, rubles	Total income of the revenue group for 2018, mln. rubles
1	2	3	4	3*4
1	1.9	14.88	6,449	95,961
2	3.4	14.88	11,179	166,344
3	4.5	14.88	14,778	219,897
IV	5.6	14.88	18,451	274,551
V	6.8	14.88	22,517	335,053
VI	8.2	14.88	27,308	406,343
VII	10.0	14.88	33,343	496,144
VIII	12.6	14.88	41,688	620,317
IX	16.7	14.88	55 375	823,980
X	30.3	14.88	100,692	1,498,297
Total by column	-	146.88	-	4,936,886

Source: Social status and standard of living of the population – 2019

The second data block represents the distribution of income by income intervals. As an adjustment, the last three groups were combined into one – income of over 60 thousand rubles (Table 2).

Table 2. Distribution of income of the population by social groups, taking into account income intervals; 2018

The income per person, thousand rubles	Annual income per person, thousand rubles	Percentage of the population included in the group, %	The number of the population included in the group, million people
up to 7	up to 84	4.9	7.20
(7–10]	(84-120]	6.9	10.13
(10–14]	(120-168]	11	16.16
(14–19]	(168-228]	13.7	20.12
(19-27]	(228-324]	18	26.44
(27-45]	(324-540]	23.7	34.81
(45-60]	(540-720]	9.4	13.81
(60-75]	(720-900]	5.0	7.34

The income per person, thousand rubles	Annual income per person, thousand rubles	Percentage of the population included in the group, %	The number of the population included in the group, million people
(75-100]	(900-1200]	4.0	5.88
over 100	more than 1200	3.4	4.99

Source: Social status and standard of living of the population – 2019

Next, it is necessary to merge Tables 1 and 2 using a standardized formula for calculating indicators for decile groups. The result is Table 3, which contains information on the target distribution of income among the population.

An adjustment was made in Table 3 to consider the fact that the data of the statistics service takes into account the entire population of the Russian Federation, including the non-working population. In this regard, to more accurately estimate the effect of the proposed changes in tax legislation, a coefficient of 0.78 was applied, which, according to the methodology of the World Inequality Laboratory, separates adults (more than 20 years old) from young ones, which makes it possible to consider in the study only citizens who have income and, therefore, pay taxes.

Table 3. Decile table of household income/2018

Decile	Limits of the average per capita income per year for the adult population, rubles	People in the group, million people	The income per person in the income group per month, rubles	The income per person in the income group for the year, rubles	Group income per year, rubles
1	2	3	4	5	6
1	up to 108	14.88	6,449	77,388	1,151,533
2	(108-154]	14.88	11,179	134,148	1,996,122
3	(154-215]	14.88	14,778	177,336	2,638,760
IV	(215-292]	14.88	18,451	221,412	3,294,611
V	(292-415]	14.88	22,517	270,204	4,020,636
VI	(415-692]	14.88	27,308	327,696	4,876,116
VII	(692-923]	14.88	33,343	400,116	5,953,726
VIII	(923-1153]	14.88	41,688	500,256	7,443,809
IX	(1153-1538]	14.88	55 375	664,500	9,887,760
X	more than 1538	14.88	100,692	1,208,304	17,979,564
Fund ratio		15.6		Total revenue	59,242,637

As a fundamental principle in the implemented modeling, it is assumed that changes in taxation affect two decile groups – the upper (X) and lower (I). Taxation of other decile groups does not seem appropriate due to the fact that the risk of reducing the economic activity of people belonging to these groups significantly exceeds the potential additional revenues to the budgets of the subjects of the Russian Federation and the budgets of municipalities. However, the data for the presented subgroups.

The change in taxation for the lower (I) decile group is carried out through the implementation of measures to provide tax benefits – a reduction in the income tax rate, the introduction of a non-taxable minimum, various measures to introduce new tax deductions, and so on. The upper (X) decile, due to its internal heterogeneity, is further divided into five subgroups. The data for each subgroup is taken based on the draft law on the introduction of the progressive scale in the Russian Federation. Such a breakdown (into 5 subgroups) is determined by the availability of initial statistical information; if more detailed

official income information is available, it is possible to consider other classification subgroups within the 10th decile.

Consideration of the remaining decile groups in the framework of this calculation system does not make sense, since income below 75 thousand rubles per month (the upper limit of decile IX) is impractical to impose a progressive personal income tax (the reasons were mentioned earlier). Therefore, only two decile groups – I and X, are involved in the calculations, as the groups for which changes in the tax legislation will be implemented.

Next, we proceed to the formation of subgroups for the decile group X. Following the calibration condition$W_9 < W_{10.1}$, the income level for the first subgroup of decile group X cannot be less than the value for the highest limit of decile group IX. This condition will be violated if the specified indicator for subgroup 10.1 is calculated according to the arithmetic mean rule. This is due to the fact that the distribution of income within the income group is configured in such a way that it is strongly shifted to the left – to the lower-income boundary, while the usual averaging assumes a concentration of taxpayers in the middle of the income interval.

Based on this, there is a problem of determining the lower bound of the first subgroup for the decile group X. To solve this problem, a correction factor was determined that allows effectively calculating the level of average income for each subgroup of the decile group X.

To do this, it is assumed that the average per capita income per person from the lower subgroup of decile group X, i.e., from subgroup X.1, must be at least 5% higher than the average income of decile group IX. Then it will be $55{,}375 * 1.05 = 58{,}143$ rubles per month or 697,725 rubles per year. Hence, it is easy to determine the total income of subgroup X.1 ($D_{X.1}$) in the form of the product of the size of the subgroup ($L_{X.1}$) by the average income ($W_{X.1}$), i.e. $D_{X.1} = W_{X.1} * L_{X.1}$) After that, the adjustment coefficient (k) is calculated using the formula for aggregating income boundaries: $k = \frac{W_{X.1.max}+W_{X.1,min}}{W_{X,1}}$. Calculations give the coefficient k=4.52.

For other subgroups of the 10th decile, their total income is calculated as the difference between the income of the entire decile group and the income of the lower decile subgroup (X.1), and then the correction factor for them is calculated using the formula:

$$k = \sum_{i=2}^{5} \frac{W_{X.1.max} + W_{X.1,min}}{D_X - D_{X.1}} \qquad (17)$$

where D_X is the total income of the decile group X; $D_{X.1}$– the total income of the lower subgroup of the decile group X.

The calculation gives a single value of the correction factor k=3.56. However, with such values for group X.4, a conflict arises, consisting in a violation of the second calibration condition:$W_{X.4,min}$<$W_{X.4}$<$W_{X.4,max}$, according to which the average income of the subgroup shall fit into the corresponding income intervals. Such a departure from the boundaries of the designated intervals is unacceptable and requires additional adjustment, which is carried out by expert means, followed by the redistribution of income of subgroup X.4 in favor of subgroup X.5. The final correction factors for the subgroups are as follows: $k_{X.1}$=4.52; $k_{X.2}$=3.56; $k_{X.3}$=3.56; $k_{X.4}$=2.90;$k_{X.5}$ =3.99.

The presented correction factors allow forming the final data for the formation of data for the implementation of scenario analysis (Table 4).

Table 4. Initial data on the income of high-income groups of the population; 2019

Decile groups and subgroups of decile groups	The number of decile groups and their subgroups, people	The lower limit of the annual income for the decile group, rubles	The upper limit of the annual income by decile, thousand rubles	Income of the decile group, million rubles	The average annual income of a taxpayer in the decile group, rubles
1	11,606,400	0*	108*	1,151,533	99,215,35
IX	11,606,400	923*	1,153*	9,887,760	851,923.08
X	11,606,400	1,153**	-	17,979,564	1,549,107,73
X.1	11,106,514	1,153	3,000	9,889,839	890,453.93
X.2	460,342	3,000	10,000	1,904,241	4,136,579,55
X.3	38,499	10,000	500,000	5,318,178	138,138,075,52
X.4	615	500,000	1,000,000	343,811	559,041,771,80
X.5	430	1,000,000	3,500,000	523,495	1,217,431,273,11

*Data for the entire population.

**Data are applicable to both the general population and the taxpayer

The results of the introduction of a progressive tax system directly depend on the parameters that will be included in such a system. In this regard, it is advisable to implement a scenario analysis that will determine the consequences for the most averaged indicators. In this regard, it is proposed to implement three options for scenario analysis.

These scenarios provide for the full range of possible reforms (since the presented scenarios were proposed in one way or another as part of the reform of the personal income tax system with the introduction of a progressive tax scale). As a lower extreme point, we consider a scenario that does not provide for radical quantitative changes in the existing income tax system. The second scenario acts as the upper limit of the reform, implying an extremely strong increase in the tax rate for the highest-income group (70%). All other reform options fall between these two extreme scenarios. In this regard, we can limit ourselves to these three scenarios as quite representative reform projects. The specified parameters that take part in the scenario analysis are presented in Table 5.

Table 5. Parameters of the personal income tax reform of political parties in Russia

Scenarios	Annual income interval, rubles		Tax calculation formula
	The lower limit, thousand rubles	The upper limit, thousand rubles	
Scenario 1 Parameters	0	100	5%
	100	3,000	(100 * 5%) + (Income over 100 * 13%)
	3,000	10,000	(100 * 5%) + ((3,000-100) * 13%+(Income over 100 * 18%)
	10,000	-	(100 * 5%) + ((3,000-100) * 13% + (10,000-(3,000-100)) *18%) + (Income over 10,000 * 25%)
Scenario 2 Parameters	0	180	0%
	180	2,400	(Income over 180 * 13%)
	2,400	100,000	((2,400-180) * 13% + (Income over 2,400 * 30%)
	100,000	-	((2400-180) * 13%+(100000-(2400-180)) * 30% + Income over 100,000 * 70%)
Scenario 3	0	24,000	13%

Parameters	24,000	-	(24,000*13%) + (Income over 24,000 kRUB * 18%)

Since the proposed reform scenarios do not coincide with the data we received from Table 4, then we will continue to consider a kind of unified revenue forks that allow linking the data of scenario analysis to the data obtained in Table 4. Also, as an additional scenario, it makes sense to consider increasing the existing personal income tax rate from 13 to 15%. The results of the scenario analysis are presented in Table 6.

Table 6. Scenario calculation of the effectiveness of implementing changes in the tax system of the Russian Federation

Scenario modeling	The first parameter of the model is the social coefficient of funds		The second parameter of the model – State revenues	
	F	ΔF	Abs. growth rate, trillions of rubles	Rel. growth rate, %
Scenario 1	13.3	-2.2	0.52	7.3
Scenario 2	12.1	-3.5	1.09	14.7
Scenario 3	15.3	-0.3	0.32	3.9
Scenario 4	15.6	0	1.11	15.8

4. CONCLUSION

The results of the scenario analysis allow coming to several conclusions.

The first conclusion, which is a consequence of the scenario analysis, is that the results of the introduction of a progressive scale of taxation of the income of individuals are significantly less than the effects that appeared in the draft political reforms. Thus, in the framework of scenario 1, the potential effect of the introduction of the tax calculation rules presented in Table 5 was (regarding additional budget revenues) – 1.15 trillion rubles. As can be seen from Table 6, the real effect calculated using the two-parameter model is much lower – 0.52 trillion rubles, which is 2.2 times less than the amount stated in the political reform program.

The developers of the second scenario in their calculations concluded that the effect of the implementation of their program of reforming the system of taxation of personal income will amount to 2.05 trillion rubles. Therewith, as follows from the calculations (Table 6), the real effect is also half as much as stated – 1.09 trillion rubles (Kshetri, 2018).

Regarding the third scenario, the authors of the reform claimed an increase in budget revenues by 0.2 trillion rubles. The author's calculation carried out above shows that the real effect of the implementation of the scenario will be greater by 50% – 0.32 trillion rubles.

Regarding the fourth scenario proposed by the authors of the work, it can be noted that scenario modeling showed an increase in budget revenues of the Russian Federation by 1.11 trillion rubles, which is more than the above scenarios. Herewith, the implementation of this scenario has the least risks from the social effect, while the other scenarios under consideration hurt the social aspect of changes in the personal income tax rate. Accordingly, speaking about the formation of an effective system of taxation of personal income, a simple adjustment of the tax rate to 15% has a greater potential in terms of generating budget revenues.

However, a significant disadvantage of the fourth scenario is that it does not have any impact on the social injustice that has developed in the country. Also, today, the economy, as a result of the pandemic, has a

difficult situation with the income of individuals. In particular, the number of poor people whose income is below the subsistence minimum has significantly increased.

In this regard, any change in the system of taxation of personal income, which will be aimed at increasing the revenues of the budgets of the Russian Federation, should go along with the introduction of measures to protect the least protected segments of the population. That is a non-taxable minimum should be introduced, which will not be less than the minimum wage (adjusted for each region).

The second conclusion, which can be reached as a result of the analysis and the first conclusion – is that the authors of the reforms overestimate the effect of their proposed changes in the tax system. As part of this study, it was revealed that such overstatements are the result of analysts' misconceptions about the distribution within income groups. In all the materials that were attached to the draft reforms (Chen, Hsu, Mino, 2015; Kosov et al., 2019), the arithmetic mean was used as a method for calculating the average income for the group, which does not correspond to the nature of the distribution of income within the group.
As mentioned in the study, the distribution is left-centered, that is, the main part of the group is grouped to the left of the average value for the group, which does not allow using the arithmetic mean for such calculations. Moreover, this distribution fits very well into the logical architecture of income – the larger the income, the fewer people have it.

In conclusion, the implemented steps towards the introduction of a progressive tax rate (an increase in the rate for incomes exceeding 5 million rubles), which were the result of the coronavirus pandemic, are sufficient in the current economic situation. Further changes in the system of taxation of personal income can lead to several negative consequences – the departure of wages to the shadow sector, a decrease in economic activity of the population, a reduction in investment costs on the part of individuals, and other macroeconomic consequences.

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