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## A return to progressive personal income tax in the Russian Federation: some estimations

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### ABSTRACT

This paper examines the possibility of reintroducing a progressive personal income tax in the Russian Federation and presents quantitative estimations of the possible outcomes of such a move. The main sources of statistical data for the analysis of distributions of taxpayers in terms of their income are considered (different resources of the Federal State Statistic Service and the Federal Tax Service statistics). The shortcomings of the existing statistical information were shown. Under the absence of officially published data on the distributions of taxpayers by income received, a lognormal distribution curve is simulated. The estimations of the distribution curve are based at the National Accounts data. Several systems of income tax brackets, rates and models of tax deductions are tested on these simulated data. The parameters of the tax burden shift onto the tenth decile of taxpayers and 1% of the highest-income taxpayers, a decrease in the decile ratio (in terms of disposable income) as well as changes in budget revenues according to tax scale options are estimated. The estimations show (1) none of the tested models of tax brackets, rates and deductions provides a principal reduction of the decile ratio (for disposable income); (2) a potentially significant reduction of the tax burden on the poorest groups of the population and the growth of the level of tax paid by high-income groups are possible; (3) it is possible to decrease the tax burden on the low income groups together with a rise of the budget revenue. The article concludes that it is necessary to test different variants of tax brackets, rates and deductions in real life circumstances and not on simulated data when progression in personal income tax is reinstated.

### KEYWORDS

Personal income tax, progressive tax scale, flat rate, lognormal distribution of taxpayers, tax burden, tax deduction

JEL H20, H22, H24

### HIGHLIGHTS

1. The lognormal distribution curve based at the National Accounts data is generated to evaluate the distribution of PIT (NDFL) taxpayers in terms of taxable income
2. Testing of the different progressive tax models (brackets, rates and deductions) based on this lognormal distribution curve allowed to make quantity assessments of the possible shift of the tax burden onto the tenth decile of taxpayers and to 1% of the highest-income taxpayers
3. It is demonstrated that the progressive tax rates make it possible to decrease the tax burden on the low income groups together with a rise of the budget revenue

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## **Возврат к прогрессивному налогу на доходы физических лиц в Российской Федерации: некоторые оценки**

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### **АННОТАЦИЯ**

В статье исследуется возможность возврата к прогрессивной модели налогообложения доходов физических лиц в Российской Федерации и представлены количественные оценки предполагаемых результатов. Рассмотрены основные источники статистических данных для анализа распределения налогоплательщиков по объему полученных доходов (различные ресурсы Росстата и данные Федеральной налоговой службы). Показаны недостатки существующих статистических данных. В условиях отсутствия официально публикуемых данных о распределении налогоплательщиков по объему доходов моделируется кривая логнормального распределения. Оценки кривой распределения базируются на данных Системы национальных счетов. На этих данных тестируются четыре варианта шкал прогрессии подоходного налога и различных вариантов налоговых вычетов. Оценены параметры смещения налогового бремени на налогоплательщиков десятого дециля, на 1% наиболее высокодоходных налогоплательщиков, снижение значения коэффициента фондов (по объему располагаемых доходов), а также изменение доходов бюджета по вариантам налоговых шкал. Показано, что (1) ни один из рассмотренных вариантов налоговых шкал и вычетов не дает принципиального снижения коэффициента фондов (по располагаемым доходам); (2) потенциально возможно существенное снижение налогового бремени на низкодоходные категории населения и смещение бремени на высокодоходные группы; (3) возможно снижение налоговой нагрузки на низкодоходные категории населения при росте доходов бюджета. В статье делается вывод о необходимости тестирования различных вариантов налоговых шкал и вычетов на реальных, а не на сгенерированных данных при возврате к прогрессии в налоге на доходы физических лиц.

### **КЛЮЧЕВЫЕ СЛОВА**

Налог на доходы физических лиц, прогрессивная шкала налогообложения, плоская ставка, логнормальное распределение налогоплательщиков, налоговое бремя, налоговый вычет

### **ОСНОВНЫЕ ПОЛОЖЕНИЯ**

1. Для оценки распределения налогоплательщиков НДФЛ по объему облагаемых доходов генерируется кривая логнормального распределения на базе данных системы национальных счетов
2. Тестирование различных моделей прогрессивного налогообложения (налоговых шкал и вычетов) на основе этой построенной кривой логнормального распределения позволило количественно оценить масштабы возможного смещения налогового бремени на налогоплательщиков десятого дециля и на 1% наиболее состоятельных налогоплательщиков
3. Показано, что использование прогрессивной шкалы налогообложения позволяет значительно понизить уровень налогообложения низкодоходных групп при одновременном увеличении доходов бюджета

## **Introduction**

Seventeen years have passed since the Russian Federation abandoned a progressive income tax (PIT, or NDFL in the vernacular) and introduced a flat tax model in 2001. Only a few serious quantitative assessments of the efficiency of the both models have made and recorded in the Russian economic literature. The most comprehensive assessments of the consequences of the PIT reform are presented in the works of the Gaidar Institute. They show that tax revenue grew at an accelerated pace just after the reform [1]. Quantitative assessments of the consequences of the introduction of a flat income tax along with changes in social security taxes are given in [2–4]. A relatively small number of authors supported the view on the effectiveness of the flat rate model during the first post-reform years or several years later. Positive results of the PIT reform such as the accelerated tax revenue growth together with the rate reduction are mentioned in [5, p. 7–8].

There were several reasons for introducing a flat income tax rate. The first one was to streamline the tax administration and to improve its efficiency. The second one was to have an influence on the shadow economy as a flat tax rate was supposed to encourage the official reporting of wages, thus moving them out of the grey zone. Two more reasons for the flat tax were discussed in [6] – the fiscal role of the tax and tax neutrality. This paper examines the rate of achievement of the reforms goals and shows that the only aim reached was improved tax neutrality. The goal of improving the efficiency of tax administration was reached in part. But the problems of the shadow economy and boosting the fiscal role of income tax are as relevant as ever [6, p. 168–172].

Seventeen years on, all arguments for a flat tax are still relevant, but now we also have a few more acute problems such as tremendous and widening income gap; growing poverty rates; an escalation of social problems associated with social justice and some others. As a result, there is a number of papers that suggests bringing back a progressive income tax.

## **Problem definition**

One of the main reasons for the reintroduction of a progressive income tax is the reduction of income inequality and, therefore, more social justice [7–10].

Thus in [9, p. 110] it is stressed that a tax system can be considered as fair only if it reduces inequality in the economic status of taxpayers. In the framework of the discussion of different aspects of tax equity under theoretical approaches in [11], the responsibility for socio-economic differentiation was partly placed at the existing flat rate tax.

The possibility (or opportunity) to collect much more tax revenue under the progressive income tax model or the anti-crisis role of the tax are not prioritized in the discussion in the economic literature [12–14]. The social justice argument and the prospects of higher tax revenue can, however, be complemented with economic efficiency reasoning based on the welfare function. A flat tax and avoidance of income redistribution create the necessity to use other means to support low income groups of people. The cost of such support mechanisms is higher for poor people, for rich people, as well as for society in general [15, p. 205] than the cost of tax methods of income redistribution.

The papers mentioned and some others focus at theoretical and qualitative approaches to the possibility of re-introducing a progressive income tax. There are no quantitative estimations of the possible consequences and the influence of the progressive tax implementation either on income differentiation or on public revenue.

The Russian economic literature mostly focuses on the necessity of a progressive income tax as an instrument of improving social justice and pays less attention to its implications for GDP growth, investment and the dynamics of the shadow economy. At the same time, researchers in the countries whose tax system uses a progressive income tax tend to criticize the progressivity of the tax and emphasize a trend towards having a flat rate [16; 17]. The last two decades of the 20<sup>th</sup> and the first decades of the 21<sup>st</sup> century show an expressed trend towards a decline in the top

statutory personal income tax rates and towards a reduction in the number of tax brackets in the western economies [18].

Several estimations of the redistributive effects of different tax models have been made based at the statistical data for the states and provinces of the US and Canada. Officially published statistical information in the two countries makes it possible to conduct extensive research of the impact of progressive and flat rate taxation on income redistribution [19–22]. “The North American discussion of the flat tax could be characterized as ‘nice theory, but not practical’” [20, p. 103]. Studies of the actual implementation of a flat rate tax in developing countries lead the authors to a decisive conclusion: “Today, progressive personal income tax rates make for a needlessly complex tax system. Increasingly, therefore, taxpayers ask if there is a realistic alternative to our wasteful, inefficient tax system. This chapter’s answer is a resounding yes” [20, p. 130]. At the same time, existing estimations of the redistributive potential of a transition from the flat rate to a progressive one shows a very minor impact on income redistribution [23].

It seems that the problem is to find a balance between a progressive tax with its tendency to promote the grey economy and a flat rate with its relatively high burden at low-income persons and the need for social transfers. In other words, to establish appropriate rates of progressive tax. Each country will look for its own balance of the rate of progressivity and the ‘degree’ of its flattening.

For the Russian Federation there are several questions concerning the choice between a flat and progressive tax rate. The first one is the level of the tax burden on low-income groups. Is it possible to decrease this level by adopting a progressive income tax and how much will it cost in terms of the public revenue? The next question is what influence of a progressive PIT will have on income inequality in our country. To answer these questions, it is necessary to have information about the distribution of personal income.

The present analysis is designed as an improvement on the previous literature in

several respects. First, it will show a possible approach to making quantitative estimations of before- and after-tax income distribution in the Russian Federation. Second, it will test various progressive tax rates and compare the results for taxpayers and budget revenue. And third, it will provide an answer as to whether it is possible in the case of Russia to essentially reduce income differentiation by introducing a progressive income tax.

### **Data sources**

The problem of personal income distribution may be examined in terms of different but interrelated aspects as per the objectives of each study. For example, to study social problems (poverty, income inequality) one can use information about total income or disposable income distribution of the total population of the country. Under this approach, the total population of the country includes not only employed or self-employed people and entrepreneurs but also retired persons, children etc.

The second aspect presents a study of the level of wages and other similar payments to employees. In the framework of this aspect, the study includes only workers, employees, officials, and other groups of the workforce, but does not include persons who have passive taxable income (dividends, royalties, income from property etc.).

The third aspect concerns the study of the distribution of PIT payers according to the volume of taxable income received. The mix of taxpayers according to this approach is wider than the mix of employees and workers (under the second approach) because some of retired persons and children may be considered as taxpayers if they receive taxable income (dividends, royalties etc.). At the same time, the mix of taxpayers is narrower than in the first approach, because it does not include most of children and retired persons, if they receive only non-taxable income and social transfers.

Available open-source data allow one to examine – with different rates of authenticity and varying amount of detail – only the first and the second approaches

to the problem. The Federal State Statistic Service (FSSS) publishes data on cash income (monetary income) of the population<sup>1</sup>, data on the distribution of employees by size of the salary (results of sample surveys)<sup>2</sup> and the information about the income according to the National Accounts<sup>3</sup>.

The Federal Tax Service has created a relatively standalone system of data sources presented in various forms of statistical tax reports. The information on the different types of taxpayers' income is contained in the different forms of statistical tax reporting such as 5NDFL, 7NDFL, 1DDK, 5ENVD, 5USN, 5ESHN, 1PATENT<sup>4</sup>.

<sup>1</sup> Cash income and expenses of the population. Statistical abstract. FSSS. Moscow, 2017. (In Russ.) Available at: [http://www.gks.ru/wps/wcm/connect/rosstat\\_main/rosstat/ru/statistics/publications/catalog/9416e1004017ce639c45fec7692f4691](http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/publications/catalog/9416e1004017ce639c45fec7692f4691)

<sup>2</sup> Data on the distribution of the number of employees by size of wages for April 2017. Statistical bulletin. Moscow, 2017. (In Russ.) Available at: [http://www.gks.ru/wps/wcm/connect/rosstat\\_main/rosstat/ru/statistics/publications/catalog/11c4980041c1bcbf9ee9fe27f9898572](http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/publications/catalog/11c4980041c1bcbf9ee9fe27f9898572)

<sup>3</sup> National accounts of Russia in 2011–2016. Statistical abstract. FSSS. Moscow, 2017. 263 p. (In Russ.) Available at: [http://www.gks.ru/wps/wcm/connect/rosstat\\_main/rosstat/ru/statistics/publications/catalog/doc\\_1135087050375](http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/publications/catalog/doc_1135087050375)

<sup>4</sup> Available at: [https://www.nalog.ru/rn77/related\\_activities/statistics\\_and\\_analytics/forms/](https://www.nalog.ru/rn77/related_activities/statistics_and_analytics/forms/)

Statistical tax reporting forms for NDFL (PIT) contain a considerable amount of information based on the provisions of Chapter 23 of the Tax Code of the Russian Federation. These reports are based on three main batches of information retrieved from tax agents' reports on PIT paid on behalf of employees, appendices to income tax returns and tax authorities' reports based on taxpayers' tax returns. Therefore, there occurs a substantial data overlap.

According to the FSSS, the number of the employed in the economy is 72.4 million; the size of the economically active population is 77.2 million, but tax agents paid different kinds of taxable incomes to more than 81 million persons. This means that approximately 10% of taxpayers have more than one source of income which they officially declare.

The main role in the total income of individuals is played by different kinds of income from employment (wages, salaries etc.) which is taxed at 13%. These earnings account for 69.61% of all taxable revenues before deductions and 78.14% taxable revenues after expenditure deductions. (Table 1).

The principal amount of deductions applied to the calculation of taxable in-

Table 1

**Main types of income subject to taxation, 2015, bill. rub**

Item	Income	Deductions according to the kind of income	Income less expenditures	Income less expenditures as % of total
Incomes and expenditures – total	30,076.54	5,337.26	24,739.64	–
Wages and salaries	19,741.59	0.00	19,741.59	79.80
Income from civil law contracts	307.43	3.16	304.27	1.23
Author's fee	14.42	0.74	13.68	0.06
Dividends, interest	838.55	20.76	817.78	3.31
Capital gain, income from operations with securities and other stock assets	6,470.56	4,784.35	1,686.22	6.82
Material gain	4.19	0.00	4.19	0.02
Other incomes according to tax agents information	982.19	0.00	982.19	3.97
The total amount of income from business, law practice and private practice	1,717.60	1.60	1,715.99	6.94
For reference:				
Other deductions not associated with type of income	–	526.64	–	–

Source: forms 5NDFL, 1DDK at 2015. Available at: [http://www.nalog.ru/rn77/related\\_activities/statistics\\_and\\_analytics/forms/](http://www.nalog.ru/rn77/related_activities/statistics_and_analytics/forms/)

come relates to the income from operations with securities and other stock assets and capital gains (see Table 1). These deductions make up more than 89.6% of total amount of applied deductions in 2015. However, deductions related to income from transactions with securities are deductions on expenses directly related to this kind of taxable income.

### **Methods and estimations**

The absence of officially published information on the distribution of taxpayers by received income raises the question of modeling (or constructing) this distribution.

There are several possible approaches to the modelling of this distribution:

- an approach based on the data on cash income and the distribution of the population by income size. In this case it is necessary to refine the indicators of cash income by excluding the non-taxable income – first of all, pensions and a significant number of the other social transfers that do not include in the tax base;

- an approach based on the value of wages and the distribution of employees by the size of this type of income. In this case it is necessary to refine this data by incorporating the information on other kinds of income (dividends and other income on securities, income on operations with securities, income from individual entrepreneurship etc.);

- based on the total potential taxable income estimated according to the National Accounts.

Each of the above approaches has both advantages and significant shortcomings. The distribution model based on each of the approaches will have more or less significant deviations from reality. In this study, we shall use the last approach and model taxpayers' distribution by using the National Accounts data.

In order to simulate the distribution of taxpayers according to (potentially) taxable income it is necessary to introduce the following prerequisites and conditions:

- the amount of the income of the population potentially subject to taxation was estimated based on data on wages

(including unreported payment of wages and net mixed income less social security contributions) and property income of the household sector according to the SNA;

- it is assumed that the distribution of taxpayers is a lognormal distribution. A lognormal distribution is traditionally used when we estimate the income of the population, the distribution of population by volume of deposits and some other indicators associated with the income of the population (see [24–28]);

- the number of PIT (NDFL) payers was estimated as the number of people employed in the economy. This approach has several disadvantages. Some of employed persons in the economy are not PIT payers, and some persons who are not formally “employed” are recognized as taxpayers under the current legislation. It was assumed that these groups partially offset each other, and their presence will not affect the final result;

- to plot the distribution curve, it is necessary to have two indicators – the indicator of average income and standard deviation. The average per capita income (potentially taxable income) of the employed population was estimated on the basis of the amount of income registered in the SNA and the number of people employed in the economy (see above);

- the standard deviation was estimated by selection. As the additional criterion the indicators of the share of revenue attributable to the first, ninth and tenth decile (according to wages distribution based on the data from sample surveys<sup>5</sup>) were used;

- the standard deduction is based on the number of children as at 1 January 2017 (32.238 million);

- income was assumed to be received evenly throughout the year;

- calculations were based on the average income in the group.

<sup>5</sup> Sample survey of wages. See «Data on the distribution of the number of employees by the size of wages for April 2017. Statistical bulletin. Moscow, 2017. (In Russ.) Available at: [http://www.gks.ru/wps/wcm/connect/rosstat\\_main/rosstat/ru/statistics/publications/catalog/11c4980041c1bcbf9ee9fe27f9898572](http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/publications/catalog/11c4980041c1bcbf9ee9fe27f9898572)

Three series of hypothetical distribution of taxpayers by volume of potentially taxable income were estimated. The first series presents a distribution that most accurately factors in income in the first decile; the second series most accurately counts income in the tenth decile and the third series – income in the ninth and tenth deciles together. The differences between the three variants of the distribution of income are insignificant (Table 2). The average per capita income for all series was 475,922.6 rubles per annum.

Table 2

#### Indicators of the distribution series

Series	Degree of approximation to the criterion (share of income in decile), %	Standard deviation (σ)
1	95.6	0.822
2	91.8	0.804
3	101.0	0.848

In further calculations, the third series was used because from the point of view of public revenue this segment of distribution (the ninth and tenth deciles) is of the main interest. Another reason is that the most significant approximation to actual data is achieved in this series (see Table 2).

To estimate the tax burden distribution under the existing tax model (with a flat rate) and to test different variants of progressive tax scales, groups of taxpayers with an income gap of 100,000 rubles were formed. To measure income deciles, additional adjustment “borderline” groups were made. Tax calculations for the groups were made by the average indicators. The calculations assumed that 45% of taxpayers have two children, which approximately corresponds to the number of children in Russia. It was assumed that children are evenly distributed among taxpayers of all income groups.

When assessing the distribution of the tax burden under the current tax model only standard deductions for children were considered. Today, the children-related deduction exceeds 73% of the total value of deductions (without taking into account the deduction of securities transactions expenses). The results of the tax burden distribution under the existing PIT model are presented in Table 3.

Table 3

#### The distribution of taxpayers by volume of income received, results of calculations (initial situation), %

Deciles	Share in gross income	Share in total tax paid	Average tax rate in the group of taxpayers
First	1.77	1.49	10.65
Second	3.29	3.03	11.71
Third	4.53	4.29	12.05
Fourth	5.61	5.43	12.29
Fifth	6.68	6.59	12.56
Sixth	8.10	8.09	12.71
Seventh	9.57	9.63	12.82
Eighth	13.24	13.40	12.90
Ninth	17.22	17.49	12.94
Tenth	29.99	30.57	12.99

The evaluation of the actual distribution of the tax burden among groups of taxpayers (deciles) based on the generated distribution indicates a very small shift of the tax burden onto taxpayers belonging to the tenth decile. Thus, their share of income being almost 30%, their share in the total amount of tax paid is 30.6%.

#### Different systems of tax rates: comparison of results

The transition to, or re-introduction of a progressive model of taxing the income of individuals (NDFL) should pursue the following goals:

1. The shift of the tax burden onto high-income categories of the population. In the framework of this study, the goal can be formulated as achieving a share of the tenth decile of 50% of the total income. As an intermediate goal, one could consider the achievement of this indicator's value at 44% (ten points higher than now). As an additional goal, one could consider having 1% of the highest income earners pay 20% of the total personal income tax.

2. Household income at the minimum subsistence level should not be subject to income tax. That means the necessity to introduce a non-taxable minimum income or a standard tax deduction amounting to the minimum subsistence income per each member of a household (taxpayer himself, his or her spouse, and children). In this study, deductions for children were considered at the existing level (1400 rub for

each child a month). A standard deduction for taxpayer was taken into account at the level of 10,000 rub per month and applied to taxpayers whose income is less than 500,000 rubles per annum. The introduction of the income threshold above which no deductions for children and the personal deduction are applied allows one to slightly increase the degree of taxation progressivity. This affects low and middle-income categories of taxpayers.

3. An increase in total PIT revenue compared to the baseline (the actual PIT revenue in 2015). As an intermediate result, we can consider the absence of a reduction in the amount of tax revenue compared to the basic indicators.

One of the problems encountered in the formulation of these goals is their com-

patibility and the hierarchy of each of the goals. In the study, various options and combinations of quantitative indicators for these goals were tested. Some results of testing on the data of the simulated distribution series of four variants of progression in the taxation of personal income are given below.

Let examine the four models of a progressive tax scale composition together with a system of deductions (see Tables 4–5): relatively radical, radical, conservative-radical and social-liberal models. The names of the models here are nominal and not bear much meaning.

A *relatively radical model* of tax rates allows for a 41%-shift of the total tax paid (total tax burden) onto the tenth decile. With a 30% share of income in the

Table 4

**Parameters of tax rates and deductions (three models)**

Indicators	Relatively radical model	Radical model	Conservative-radical model
<i>Intervals of the annual taxable income, Rates, %</i>			
Less than 500 thousand rubles (40.66 thousand rubles a month)	13	13	13
500,001 thousand – 1200 thousand rubles (40.66 – 100 thousand rubles a month)	20	20	20
1200,001 thousand – 3200 thousand rubles (100 thousand – 250 thousand rubles a month)	25	30	30
3200,001 thousand – 6000 thousand rubles (250 thousand – 416.60 thousand rubles a month)	30	40	38
More than 6000,001 thousand rubles (more than 500 thousand rubles a month)	40	45	47
<i>Other conditions</i>			
Children's deductions	1.4 thousand rubles a month if the annual income less than 4200 thousand rubles a year	1.4 thousand rubles a month if the annual income less than 4200 thousand rubles a year	1.4 thousand rubles a month if the annual income less than 360* thousand rubles a year
Nontaxable minimum	10 thousand rubles a month if the annual income less than 4200 thousand rubles a year**	10 thousand rubles a month if the annual income less than 4200 thousand rubles a year	7.5 thousand rubles a month if the annual income less than 360 thousand rubles a year

\* The annual average of the accrued salary in 2015.

\*\* In 2015, for the working-age population, the subsistence minimum was 10,404 rubles, for pensioners – 7916 rubles.



tenth decile, the share of total tax here will be 41.1%. The average (effective) rate for this category of taxpayers will be 19.57%. In this case, 1% of the wealthiest taxpayers pay 10.22% of the total tax (bear the tax burden), and the average (effective) rate for these taxpayers will be 23.27%.

Under this model, it is possible to completely exempt taxpayers with the lowest level of income (less than 14,000 rubles per month) from taxation. This model makes it possible to increase budget tax revenues by 21.24% in comparison with the baseline version. The estimates (here and further on) do not take into account the possibility of tax arbitration and a potential increase in tax evasion.

In the framework of a *radical model*, the increased degree of the tax progressivity makes it possible to shift the tax burden onto the tenth decile 3 p.p. more, and to the ninth decile 1.9 p.p. more than in the relatively radical model. This variant of tax rates reduces the tax burden on the fifth, sixth and seventh deciles by 0.2–0.4 percentage points by changing the structure of rates. The burden on the first decile does not change, and on the second and third is slightly reduced (compared with the relatively radical model). The budget receives a tax revenue increase of almost 4% (without considering different risks).

Within the framework of a *conservative-radical model*, the amount of deductions was not as significant as in the first two. The application of these tax rates in conjunction with a system of deductions (see Table 4) has the potential to increase budget tax revenues by 26% compared to the initial situation. In this case, taxpayers within the first decile are not fully exempt from taxation, although the average rate for this group is less than 0.5%. However, in the second decile the average tax rate is close to the current one and is 11.7%.

This model makes it possible to shift almost 44% of the total tax burden onto taxpayers belong to the tenth decile. The average tax rate for this category of taxpayers is 21.09%. One percent of the richest taxpayers account for 11.21% of the total tax paid, and the average tax rate for this group exceeds 26%. When apply-

ing this model, only 30% of taxpayers will face an increase in the level of taxation (eighth-tenth decile). At the same time, for the eighth decile taxpayers, the increase in the tax burden will be only 1.68 p. p. and only 10% of taxpayers (the first decile) will experience a significant reduction in the tax burden.

Table 5  
Parameters of tax brackets, rates and deductions for the social-liberal model (fourth model)<sup>6</sup>

Indicators	Parameters
Intervals of the annual taxable income	Rates, %
Less than 1500 thousand rubles	13
1500,001–2500,000 thousand rubles	23
2500,001–3500,000 thousand rubles	28
3500,001–4500,000 thousand rubles	33
4500,001–5000,000 thousand rubles	38
more than 5000.000 thousand rubles	13
Children's deductions	10 thousand rubles a month without any limit
Nontaxable minimum	10 thousand rubles a month without any limit

The most significant feature of a *social-liberal model* which makes it different from the first three is the tax rate of 13% applied to the highest income (more than 5 million rubles a year, see Table 5). This rate should support the investment activity of high-income groups of the population and reduce the effectiveness of tax evasion (according to the point of view in [25]).

The application of large-scale tax deductions in the amount of the subsistence minimum for the taxpayer and their children in combination with a progressive scale (Table 5) allows one to shift a sufficient part of the total tax burden onto the tenth decile (almost 50% of the total tax in this case falls on the last decile). But in this case, the total amount of tax revenue received by the budget system is reduced by

<sup>6</sup> The explanation for the scale is given in [8].

20% compared to the initial situation. This tax model almost completely eliminates the tax burden for taxpayers in the first and second deciles. The effective tax rate becomes lower than the nominal rate for taxpayers belonging to the third-eighth deciles. For taxpayers of the ninth decile, the effective tax rate is almost equal to the nominal (13.07%). And only the tenth decile will “suffer” from an increase in the tax burden – the effective tax rate here will be at 15.24 (not much higher than it is now). In this case, only 10% of the population will feel an increase in the tax burden. For 90%, the tax burden will either decrease or remain at the same level.

The distribution of the tax burden (total tax) among taxpayers related to different deciles is shown in Figure 1.

The most significant redistribution of the total amount of tax (total tax burden) in favor of the tenth decile of taxpayers is provided by the “social-liberal” model of tax brackets. The “radical” model produces the second largest shift of the tax burden onto the highest-income categories of taxpayers. The “radical” model provides an increase in tax revenues compared to the initial situation by 25.3%, whereas the “socially-liberal” one results in a reduction in the total amount of tax by 20%.

The models of progressive personal income tax discussed above differ not only in the actual rates and deductions.

They also differ in terms of the resulting indicators for the revenues of the system of public funds, the disposable income of the population and differentiation of the latter by disposable income.

The most significant increase in public tax revenues compared to the initial situation is provided by a “conservative-radical” model (by 26.28%), which is only slightly more than by the “radical” one (25.23%). But the degree of the tax burden shift to the taxpayers of the tenth decile is slightly worse than in the “radical” model – 43.77% against 44.13% (see Table 6).

The closest approximation to the different goals mentioned above occurs in the various models considered (See Table 6). The most significant shift in the tax burden on taxpayers of the tenth decile takes place in the “social-liberal” version –almost 50%. A zero tax burden on the first decile of taxpayers is achieved in three models, and in the fourth this indicator is only slightly different from zero. We can therefore say that all four models discussed are satisfactory for this criterion. From the point of view of budget tax revenue dynamics, the most preferable model is the “conservative-radical” one as it provides a potential increase in revenues of 26%. The “radical” one, however, yields a value of the indicator that is only one percentage point less.

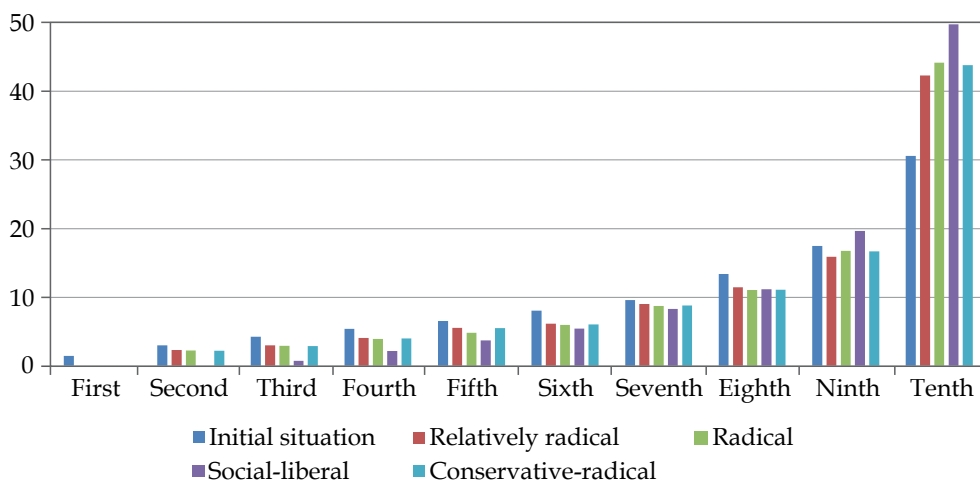


Figure 1. Distribution of the tax amount among taxpayers by deciles

Let's have a look at the decile ratio of the disposable income. If in the initial situation its value exceeds 20.3, then in all the simulated models the decile ratio is significantly lower (Figure 2 and Table 6). This means that the degree of the differentiation of taxpayers in terms of disposable income is reduced in the case of a system of deductions and a progressive tax. The most significant reduction of the scale of differentiation is achieved in the "radical" model – the decile ratio is reduced to 16.0 (this figure itself is quite high). The value of the decile ratio in the "radical-conservative" model is slightly higher – 16.1. The difference between these indicators in general is negligible

(particularly considering the total error of the estimates). The least significant decrease in the scale of differentiation is observed in the "social-liberal" model – the decile ratio is 17.2.

Considering the shift of the tax burden to 1% of the richest taxpayers, the most preferable is the "social-liberal" model, where the share of tax within this group is 12.7%. In other models, the share of tax, which falls on 1% of the richest taxpayers is 10 to 11%. At the same time, the estimated tax rate for the highest-income individuals in the framework of the "socially-liberal" model is the lowest – 19.15%. In all other models, the average tax rate for this group of taxpayers is sig-

Table 6

Some indicators of the models, %

Item	Initial	Relatively radical	Radical	Social-liberal	Conservative-radical
First decile (share), %	1.37	0.00	0.00	0.00	0.05
Average rate in the 1 <sup>st</sup> decile, %	10.65	0.00	0.00	0.00	0.46
Tenth decile (share), %	34.02	42.29	44.13	49.71	43.77
Average rate in the 10 <sup>th</sup> decile, %	12.98	19.57	21.09	15.24	21.09
1% of the most high income taxpayers (share), %	6.92	10.22	10.22	12.70	11.21
Average rate in the group of 1% of the most high income taxpayers, %	13.00	23.27	23.27	19.15	26.58
Decile dispersion ratio (fund ratio) of disposable income	20.3291	16.351	16.042	17.231	16.114
Budget tax receipts (% of initial situation), %	100.00	121.24	125.23	80.32	126.28

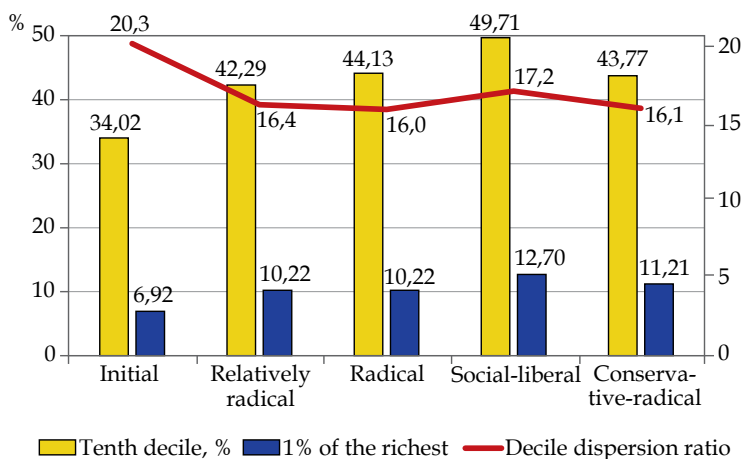


Figure 2. Tax burden on taxpayers in the tenth decile and the decile ratio of discussed models

nificantly higher and ranges from 23% to 26%. Such values of the indicators under the “social-liberal” model are largely the result of substantial tax deductions that the taxpayer and his children are eligible to without an income tax threshold to be applied. In other models, this threshold is applied. So, the wealthiest persons are effectively denied the right to use these deductions.

In general, the “radical” and “conservative-radical” models bear the most practical interest. The choice between them can be made depending on the priorities and the system of preferences: which one is more preferable – the reduction of the tax burden on the poor or a potential increase in tax revenues.

### Conclusion

The analysis of systems of tax rates and the results of their application is based on the hypothesis about a log-normal distribution of taxpayers. This hypothesis can be confirmed or refuted only on the basis of actual taxpayers distribution data published by the Federal Tax Service. In the absence of such data, researchers are left to work with hypotheses.

The results obtained allow us to solidify the recognition in the Russian economic literature of the necessity to re-introduce a progressive income tax by performing quantitative estimations of its potential consequences.

Summing up the above, it should be noted that the transition to (or rather, the re-introduction of) a progressive model of personal income taxation in case an adequate version of tax brackets and rates in combination with deductions is selected is quite feasible. A potentially significant reduction of the tax burden on the poorest categories of the population and the growth of the tax burden on high-income groups along with an increase in tax revenues for the public purse are possible. The estimations show that none of the tested models of tax rates and deductions provides a principal reduction of the decile ratio (for disposable income). To develop a system of tax rates and a system of deductions, it is necessary to test them using actual rather than generated data. It is also necessary to develop a “function of tax evasion” on the basis of real data of the Russian Federation to estimate the potential scale of tax arbitration and tax evasion.

It should also be considered that the re-introduction of a progressive tax model will have a number of consequences. A reduction in the level of taxation of low-income categories of the population would deprive some regions of the Russian Federation of a significant part of their own revenue. The introduction of progression in the PIT (if the order of transferring tax receipts to regional budgets is not revised) will lead to a situation when regions with the wealthiest population get a significant advantage.

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