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*Srdjan M. Djindjić**

THE REDISTRIBUTIVE EFFECTS OF PERSONAL TAXES AND SOCIAL BENEFITS IN THE REPUBLIC OF SERBIA

ABSTRACT: *In this paper we measure the influence of the instruments of Serbia's fiscal system - personal taxes (personal income tax and social security contributions) and social benefits (means tested and non-means tested) - on income redistribution, using the latest data from the Household Budget Survey 2012. We analyse the redistributive effects of the fiscal system for the year 2013 and of the fiscal system that has been functioning since 1st January 2014. We find that the redistributive effect reduces income inequality by about 50% in both observed years. Social benefits create 98% of vertical redistribution (2013), whereas personal taxes initiate 2% (2013). State pensions, means-tested social benefits, and social security contributions are most important in reducing inequality in Serbia (2013). The partial fiscal reform (2014) has not changed the rank of the focused fiscal instruments.*

KEY WORDS: *Redistributive effect, Income inequality, Fiscal instrument, Decomposition, Serbia.*

JEL CLASSIFICATION: D31, D33, H22, H23, H24.

* The University of Kragujevac, Faculty of Economics, Serbia,
E-mail address: srdjanmdjindjic@gmail.com

1. INTRODUCTION

The state analyses the interaction of the degree of economic inequality (the width of income disparity), dynamics of economic growth (the level and the structure of the real gross domestic product GDP), and the quality of economic growth (social stability and standard of living). The traditional view suggests that for each country the dynamics of growth are the most important, while income distribution is of residual character: inequality is a consequence of economic growth (Kuznets, 1955, pp.13-14). Recent studies offer different and even opposed views. Some authors speak of an inverse relation between income inequality and income levels (Barro 2000, p.10). Others draw attention to the global trend of growing inequality, regardless of GDP or changes in it (Galbraith, 2009, p.203). Indeed, the gap between the rich and the poor has grown in most countries (Organisation for Economic Co-operation and Development, OECD 2008). In developed countries the average income of the richest 10% of the population is about nine times that of the poorest 10%. In traditionally egalitarian countries such as Germany, Denmark, and Sweden the income disparity between rich and poor is expanding – from 5:1 in the 1980s to 6:1 today. Only a few countries have been able to buck this trend: income inequality has recently fallen in Chile and Mexico, but in these two countries the richest still have incomes more than 25 times those of the poorest (OECD, 2011, p.17). During the period from 1985 to 2005 the Gini coefficient of pre-fiscal household income has, on average, increased by 16% every ten years in OECD countries (Immervoll and Richardson, 2011, p.8). The Gini coefficient of post-fiscal household income stood at an average of 0.29 in OECD countries in 1985. By 2008, however, it had increased by almost 10% to 0.316 (OECD, 2011, p.22). Today, generally speaking, economic inequality is a problem for all national governments.

Egalitarians support a state policy of income redistribution, because market distribution is inequitable. Anti-egalitarians are against government intervention, because the market distribution of income corresponds to the common view of equity. Equality, as a positive concept, provides an answer to the question of how income is distributed. Equity, as a normative concept, provides an answer to the question of how income should be distributed, and it assumes the existence of an ethical framework, based on which we can say what is good. Most of the concepts of equity allow a certain degree of inequality in distribution. However, the important question is what most authors mean by the term "equitable distribution". The basic idea of equity stems from two questions: Who pays the highest taxes? Who receives the highest benefits? In this paper, income redistribution reflects

the process oriented to improving equity, because it symbolizes the narrowing of income disparities between households at different income levels.

The subject of this paper is empirical research on the influence the Serbian fiscal system has on household income inequality. Within this broad subject our aim is to measure the impact of concrete instruments of the Serbian fiscal system - personal taxes (personal income tax and social security contributions) and social benefits (means-tested and non-means-tested) - on income redistribution. We observe the effects of the fiscal system established for 2013, and the effects of the fiscal system which has operated since 01 January 2014.

The paper is characterized by Gini-based measures. The DAD software package is used to calculate Gini-based measures (Duclos, Araar, and Fortin, 2010). For the purpose of empirical analysis of the redistributive effects of the Serbian fiscal system and its decomposition we use measurement theory initially created by Lambert (1985, pp.43-45). Urban (2008, p.392) and Kim and Lambert (2009, p.-6) adapted this methodology and applied it in their empirical research.

The empirical research of the redistributive effects of personal taxes and social benefits is based on the latest data from the Household Budget Survey (HBS 2012), obtained from the Statistical Office of the Republic of Serbia. The obtained data which relate to the structure of the net funds of individuals for 2012 – the data on net money income and benefits – is for a sample of 13,155 individuals classified in 4,546 households. The unit of analysis is a household.

The results of the empirical research show that pre-fiscal income inequality increased in 2014 compared to 2013, while post-fiscal income inequality decreased. The fiscal systems in 2013 and 2014 equalized household incomes to an almost identical degree of approximately 50%. Most of the total redistributive effect was the result of social benefits. If there had been no horizontal inequality the fiscal system would have been about 50% more redistributive.

The results of the empirical research confirmed the original hypothesis of this paper, that the state has a significant influence on income redistribution in Serbia. The original hypothesis was based on the fact that most social resources are under state control.

The structure of the paper is as follows. In Section 2 we describe the topic of income distribution and redistribution in existing literature. In Section 3 we present the methodology used for evaluating inequality and decomposition of

redistributive effects. The main concepts of income, personal taxes and social benefits, implementation issues, and data are presented in Section 5. In Section 6 our results are compared with the corresponding results of other empirical research, while in the last section we present the concluding comments.

2. INCOME DISTRIBUTION AND REDISTRIBUTION IN THE EXISTING LITERATURE

A number of authors have analysed income distribution and redistribution. The universal problem is how to achieve an optimal tax system that depends on the trade-off between equity and efficiency. Starting with the physiocrats, through David Ricardo and Arthur C. Pigou until the current day, tax policy has tried to find forms of tax that are more or less acceptable according to both criteria. If the amount were proportional to income, a tax on that amount would make it possible to determine equity tax with minimal excess burden. The problem is to find the "holders" which the taxes that are neither equitable nor heavy could be tied to, but, unfortunately, these holders are hard to find (Pigou 1929, p.73).

Dalton (1920, p.351) stated that the transfer of income from a poorer person to a richer person results in an increase in inequality. Simons (1930, p.11) spoke of "two strictly coordinated principles", requirements for horizontal and vertical equity, which are just different sides of the same coin. Musgrave and Thin (1948, p.51) used the Lorenz curve in empirical research and formulated "the effective progression index". Bhattacharya and Mahalanobis (1967) initiated the concept of Gini coefficient decomposition in the context of population subgroups. Atkinson (1970, p.252) enriched measurement literature by saying that inequality should be measured by society's welfare losses due to unequal income distribution. In their pioneering work, Pechman and Ockner (1974) promoted the "annual approach", based on the concept of annual household (individual) income. Auerbach, Gokhale, and Kotlikoff (1991) promoted the alternative concept of "lifetime approach", based on a permanent or lifetime household (individual) income. Feldstein (1976a; 1976b) is known for his useful definition of horizontal equity, because he was the first author to point out the connection between classical horizontal equity (the equal treatment of equals, Musgrave 1959) and changes in rank (horizontal inequality as a result of a change in households'/individuals' ranking before and after tax). Rao (1969, p.418) was the first to elaborate on the issue of total inequality decomposition in income distribution in a population. His innovatory methodology of inequality measurement had a direct impact on the future of research (as noted by Rao, two decompositions of concentration

ratio, implemented in the context of sub-populations and the basic components of total income, enabled the assessment of their contributions to income inequality in a population).

Requirements for horizontal and vertical equity are the key principles governing "optimal tax policy". For Lambert (2001, p.183), horizontal equity can be seen as a rule of fairness, providing individuals and households protection against discrimination and reflecting the basic principle of equal worth. For Duclos and Araar (2006, p.127) vertical equity is the principle of distributive justice, but the degree of redistribution often initiates opposed comments. Vertical equity largely depends on the distributive consequences of progressive tax and benefit structure: individuals who have a lower income should, therefore, pay a lower tax and get higher benefits. Authors generally agree on the definition of progressivity; however, measuring progressivity is often a contentious issue. Kiefer (1984, p.511) stated that the policy implications of the distributional tax progressivity indexes gave "inconsistent responses to changes in the parameters of the tax system and income distribution". Duclos and Tabi (1996, p.166) argued that progressivity indices led to the "opposite conclusions".

Kakwani (1977a; 1977b) proposed the well-known index of tax progressivity. "A New Measure of Tax Progressivity" explains that tax progressivity is in direct relation to tax elasticity (the index increases with an increase in the tax elasticity at all income levels, and vice versa, Kakwani, 1977a, pp.73-74). The redistributive effect depends on the "deviation from proportionality", i.e., the degree of progressivity, and the average tax rate, i.e., the tax level. Kakwani (1984) completed his research by introducing the second component, re-ranking, as a segment of horizontal inequity, which is the result of changes in households' ranking due to the desire of the state to base re-ranking of households on "other criteria", as noted by Lerman and Yitzhaki, 1995 (see also complementary works by Atkinson, 1980, and Plotnick, 1981, whose complementarity is illustrated by the following sentence of Plotnick: "After this paper was completed I became aware of Atkinson (1980), who also develops some of the results shown here", Plotnick, 1981, p.284).

Lambert (1985) created a measure of the redistributive effect for taxes, social benefits, and the combined tax-benefit system. Lambert improved Kakwani's methodology and enabled the calculation of the net redistributive effect from separate distribution data for taxes and benefits (Lambert, 1985, pp.44-45). Lambert and Aronson (1993), Aronson and Lambert (1994), and Aronson, Johnson, and Lambert (1994) developed a model for isolating the re-ranking of

the unequals effect. The model was applied to a population that was divided into exactly equal pre-tax groups ("fans"), and they defined the re-ranking effect as the degree of overlapping between post-tax income ranges and pre-tax equals groups ("the tax causes rank reversals if and only if two or more of the fans overlap." Aronson, Johnson, and Lambert, 1994, p.264).

Urban and Lambert (2008) improved the methodology of Aronson, Johnson, and Lambert (1994). The methodology was based on close equals groups (CEGs) as a more appropriate way to divide the population, from a practical and methodological point of view. Measuring of horizontal inequity was innovated. Analysis of the vertical effect was also adapted to the CEGs approach. Three forms of reranking were defined: within-group re-ranking, entire-group re-ranking, and Aronson, Johnson, and Lambert re-ranking.

Apart from those mentioned above, many renowned authors and institutions conducted empirical studies of the redistributive effect. Wagstaff, van Doorslaer, van der Burg et al. (1999) decomposed the redistributive effect of personal income tax (PIT) of twelve OECD countries into four components: an average rate effect, a progressivity effect, a horizontal equity effect, and a re-ranking effect. The average rate effect was low in France and high in Nordic countries, while PIT was the most progressive in France, Ireland and Spain, and least progressive in Denmark and Sweden. Immervoll et al. (2005) showed that the equalizing effect of state pensions was small in Ireland and the UK, where pensions are primarily provided through the private sector. In all other countries the results showed that state pensions have a strong equalizing effect. Kim and Lambert (2009) analyzed the redistributive effect of taxes and welfare expenditure for the U.S. and found that inequality has shown a secular increase. Sasa Randjelovic and Jelena Zarković-Rakic (2011) analysed the distributive effects of income tax, social contributions, and benefits (Gini coefficient for pre-fiscal income in Serbia was 0.47, while the average Gini coefficient for pre-fiscal income in developed countries ranged between 0.34 and 0.54; the average value was 0.44; the Serbian fiscal system reduces inequality of income distribution by about 25%). The research conducted by Cok, Urban, and Verbič (2012; 2013) indicated that pre-fiscal income inequality was significantly higher and the redistributive effect was lower in Croatia than in Slovenia. Horizontal inequity effects were higher in Slovenia than in Croatia. Croatian PIT caused significantly less horizontal inequity than the Slovenian PIT, while the effects were quite the opposite for benefits.

3. METHODOLOGY

Redistributive effect (RE) represents the degree of change in inequality in individual (household) income because of the influence of the fiscal system. Post-fiscal income, *N*, is obtained when taxes, *T*, are deducted from pre-fiscal income, *X*, and when benefits, *B*, are added:

$$N = X - T + B \tag{1}$$

Musgrave and Thin (1948) defined the redistributive effect as the difference between the S-Gini coefficient of pre-fiscal income, G_X, and the S-Gini coefficient of post-fiscal income, G_N:

$$RE = G_X - G_N \tag{2}$$

In this paper we use the *S*-Gini (and *S*-concentration) inequality indices. "*S*" is a single ethical parameter, υ, which reflects a relative preference for equality. When υ moves from 0 to infinity the index shows an increasing aversion to inequality. The range $0 \leq \upsilon < 1$ reflects equality aversion, υ = 1 equality neutrality, and υ> 1 inequality aversion. At υ = 2 the index is equivalent to the conventional, standard Gini, which is relevant to this paper (Yitzhaki 1983).

Kakwani (1977a) established a progressivity index, *K*, as a measure of disproportionality or progressivity of tax payments, and he decomposed the redistributive effect as follows:

$$RE = \frac{t}{1-t} \cdot K \tag{3}$$

where *t* is the total average tax rate. Progressivity index, *K*, is equal to the difference between the concentration index of tax collected and the Gini coefficient of before-tax income.

Kakwani (1984) decomposed the redistributive effect as the difference between the vertical effect, (V_X), as a measure of vertical equity, and the effect of re-ranking, (R_X), as a measure of horizontal inequity:

$$RE = (G_X - D_{N;X}) - (G_N - D_{N;X}) = V_X - R_X \tag{4}$$

where $D_{N;X}$ is the *S*-concentration coefficient of post-fiscal income, *N*, for which the units are ordered by the pre-fiscal income, *X*, as it is marked in subscript.

The redistributive effect can be decomposed into its vertical and horizontal parts. The vertical effect is a measure of the inequality reduction that would be achieved if all individuals with the same income paid the same taxes. The re-ranking effect is a "negative horizontal contribution" because it represents a loss of the "potential redistributive effect" which is caused by the difference in ranking before and after the influence of the fiscal system.

Since different taxes and benefits constitute the fiscal system, there is the question of measuring the contributions of each instrument to the redistributive effect. Lambert (1985), as well as Kakwani when measuring income progressivity, starts with Plotnick's assumption that pre-fiscal income distribution is the criterion, the benchmark for measuring the vertical effect ("this focus on the process implies that the pre-redistribution ranking of incomes is accepted as fair", Plotnick 1981). This paper uses the methodology of vertical effect decomposition developed by Lambert (1985, pp.43-45). Urban (2008, p.392) and Kim and Lambert (2009, p.6) applied this methodology in their empirical research, and they adapted Lambert's original expression (1985) in order to present the contributions of each fiscal instrument, p personal taxes and q social benefits:

$$V_X = \frac{\sum_i^p t_x^i \left(D_{T_i;X} - G_X\right) + \sum_j^q b_x^j \left(G_X - D_{B_j;X}\right)}{1 - t_x + b_x} \tag{5}$$

where t_x^i and b_x^j represent the shares of tax i and benefit j in pre-fiscal income, $t_x = \sum_i^p t_x^i$ and $b_x = \sum_j^q b_x^j$; and $D_{T_i;X}$ and $D_{B_j;X}$ represent concentration coefficients of tax i and benefit j.

Relative contributions of tax (i) and benefit (j) to vertical effect (V_X) are derived as follows (Urban 2008):

$$\lambda_{T_i;X} = \frac{t_x^i \left(D_{T_i;X}\right)}{1 - t_x + b_x} \cdot \frac{1}{V_X} \tag{6}$$

$$\lambda_{B_j;X} = \frac{b_x^j \left(G_x - D_{B_j;X}\right)}{1 - t_x + b_x} \cdot \frac{1}{V_X} \tag{7}$$

The methodology does not provide the estimation of the influence of the overall fiscal system on income redistribution (inequality), but only an estimation of the influence of the observed parts of the fiscal system; in other words, the

methodology takes into account the interaction/effects of personal income tax, social security contributions, and social benefits.

The empirical research into the redistributive effects of personal taxes and social benefits is based on the latest data from the Household Budget Survey (HBS, 2012). The obtained data for 2012 relating to the structure of individuals' net funds - data on net money income and benefits – are used to evaluate the effects of the observed instruments of the Serbian fiscal systems established for the years 2013 and 2014. This approach can affect the precision of the obtained results.

The "Fiscal system of Serbia from 2013" is the system that functioned in the interval from 1st January 2013 to 29th May 2013. The "Fiscal system of Serbia from 2014" is the system that functioned from 1st January 2014, including the changes established in the second half of 2013 (after 30th May 2013). Why is this approach justified? This approach favours four arguments: (1) the essential argument (the government of Serbia introduced numerous fiscal measures in the second half of 2013, whose actual activation was post-dated to 1st January 2014); (2) the methodological argument (the observed instruments of the Serbian fiscal system from 2013 and the later instruments of the Serbian fiscal system (from 2014) were applied to the available database – individuals' net budgets for 2012); (3) the quantitative–methodological argument (clearer distinguishing of the quantitative effects of the fiscal system instruments for the years 2013 and 2014, because the Serbian fiscal system is not balanced in the sense of a balanced participation of the observed fiscal instruments in the total redistributive effect); (4) the argument connected with the realization of the midterm fiscal strategy (during the second half of 2013 the Serbian government mostly brought fiscal measures as a segment and/or a necessary condition for the realization of fiscal strategy in the period 2014-2016).

Following the empirical researches of renowned authors/institutions, the money value of natural consumption and benefit in kind are excluded from the analysis. This does not significantly affect the results of the research because of its usually small share in the net funds of individuals/households. If the money value of natural consumption and benefit in kind were included in the analysis, the implications on the research results would be negligible.

4. MAIN CONCEPTS, IMPLEMENTATION ISSUES, AND DATA

The state uses many fiscal instruments to influence the economic inequality of households (individuals). We observe the redistributive effects of the Serbian fiscal system, which is represented by personal income tax, social security contributions, and social benefits. We start with the assumption that the wage (salary) that employees receive is reduced exactly by the total amount of social security contributions - employers' social security contributions and employees' social security contributions - despite the efforts of the legislator to divide this burden evenly between employees and employers. Although estimates of labour supply elasticity differ, most economists prove that it is close to zero (Fuchs, Krueger, and Poterba 1998; Bargain, Orsini, and Peichl 2011).

The fiscal system affects the change in the level of household money income, initiating the difference between pre-fiscal and post-fiscal income distribution. The standard picture of the fiscal system's redistributive effects is that they narrow income differences between households (individuals) at different income levels. Measuring the impact of the fiscal system on changes in income inequality depends on the income concept. This paper is based on the money income concept. The money value of natural consumption and receipts in kind are excluded from the analysis.

Pre-fiscal income, X, is equal to the sum of household members' taxable and non-taxable money income, $[(X1 + T) + X2]$. Post-fiscal income, N, is households' available (net) money income. It equals pre-fiscal income minus personal taxes and plus money social benefits, $N = X - T + B$. Social security contributions are classified as taxes. State pensions, which in Serbia are tax-free, are classified as social benefits. Benefits are divided into means-tested and non-means-tested. Definitions of the main concepts used in this study are presented in Table 1.

Table 1: The concepts of income, personal taxes, and social benefits

$\boldsymbol{X = (X_1 + T) + X_2}$
X_1 - taxable money income
$X_{1.1.}$ - wage (salary) and income from self-employment[1]
$X_{1.2.}$ - income from authorship rights, related rights, and intellectual property rights
$X_{1.3.}$ - income from capital and capital gains[2]
$X_{1.4.}$ - other income[3]

X_2 - non-taxable money income
- $X_{2.1.}$ - customer and investment credits[4]
- $X_{2.2.}$ - other receipts[5]

$$\boldsymbol{T = P + D_p + D_z + D_n}$$

P - personal income tax

D_p - employers' social security contributions and employees' social security contributions for pension insurance

D_z - employers' social security contributions and employees' social security contributions for health insurance

D_n - employers' social security contributions and employees' social security contributions for unemployment insurance

$$\boldsymbol{B = Z + S}$$

Z - state pensions[6]

S - benefits
- $S_{1.1.}$ - means-tested social benefits[7]
- $S_{1.2.}$ - non-means-tested social benefits[8]

$$\boldsymbol{N = X - T + B}$$

X = pre-fiscal income
T = personal taxes
B = social benefits
N = post-fiscal income

Notes: [1] regular salaries and wages cover the income from regular employment, including the receipts of employees seconded abroad; [2] income from capital and capital gains include dividends, real estate-related income which includes room and flat rents, interest, receipts from real estate sales, etc; [3] other incomes include receipts from supplementary labour income, author's deed contract, lottery-related receipts, rent from movables, etc; [4] customer and investment credits refer to credits raised in the last 12 months; [5] other receipts include saving deposits raised, returned loans, decreased cash amounts in households, refunded nationalized property etc; [6] state pensions (old-age, family, disability, and others) cover the receipts pursuant to pension and disability insurance and supplementary payments; [7] means-tested social benefits include social aid, supplements, and other welfare receipts, child allowances, student grants and remuneration, i.e., compensation for trade students; [8] non-means-tested social benefits include receipts for cases of unemployment and temporary unemployment; alimentation and support, health insurance-related receipts, disability insurance-related receipts and supplements.
Source: Author.

Serbia has a large state, which can be seen in the consolidated government balance (Ministry of Finance of the Republic of Serbia 2013b). During 2005-2012 the share of public revenue in GDP remained unchanged at 43%, while the share of public expenditure in GDP rose from 41.9% (2005) to 49.7% (2012), "moving" Serbia from a surplus of 1.1% of GDP (2005) to a deficit of 6.7% of GDP (2012) and 4.8% of GDP (2013). State pensions and wages (salaries) of public sector employees, as the dominant public expenditures in Serbia, were mostly financed by social security contributions, value-added tax (VAT), excise, and personal income tax, which represent the most abundant source of public revenue. Presented fiscal trends and data imply the basic hypothesis of this paper: in Serbia, a large part of the society's resources is controlled by the state, which is why we assume that the state has a significant impact on income redistribution.

The personal income tax system in Serbia is established as a combination of the schedular concept, which plays a key role, and the comprehensive concept, i.e., annual income tax, which has a negligible role. The subject of our analysis is the schedular concept, because it determines the final personal income tax for 99% of taxpayers. Annual income tax is generally paid by less than 1% of total taxpayers in Serbia, which is why it is not the subject of our analysis.

In 2013 taxing citizens in Serbia was based on the schedular concept. All income sources were classified into eight categories, and each category was taxed under specific rules. The tax base represents gross income reduced by actual costs incurred in relation to the realization of such income. Taxpayers may alternatively use standardized costs, which were concretized for different income sources in the range of 20% for the category of "other incomes", to 50% for the category "income from authorship rights". Four different tax rates were applied for different tax bases, 10% (income from self-employment), 12% (wages/ salaries), 15% (income from capital and capital gains), and 20% (income from authorship rights, real estate, and other incomes).

The tax treatment of wages (salaries) is central, because in 2013 it represented the largest share of the revenues from personal income tax. Among the eight taxable income sources almost 80% were wages/salaries (Ministry of Finance of the Republic of Serbia 2013a). The tax on wages (salaries) of 12% was paid on employees' monthly gross wage (salary) reduced by the tax-free share (i.e., zero tax bracket) of 7,822 RSD per month. Social security contributions of a total of 35.8% were also paid on the monthly gross wage (salary), i.e., 17.9% + 17.9%.

The adoption of the Law on Personal Income Tax and the Law on Mandatory Contributions for Social Insurance (both adopted on 29 May 2013), and the Law on Reduction of Net Income of Employees in the Public Sector (adopted on 6 December 2013) constituted a partial fiscal reform, as part of a package of measures for the fiscal consolidation of Serbia from 1 January 2014, but the timing of the implementation of certain legal regulations differed (National Assembly of the Republic of Serbia 2013a; 2014a; and 2014b). Here follows a summary of the key changes in the fiscal system in 2014. The number of taxable income sources was reduced from eight to six categories. The definition of wage (salary) was expanded. The tax-free share of gross wages/salaries (i.e., zero tax bracket) was increased to 11,000 RSD. For employees seconded abroad, the base for wage/salary taxes is now "total wage/salary". The tax rate on wages (salaries) was reduced by 2 percentage points, from 12% to 10%. The rate of employees' pension and disability insurance contributions increased by 2 percentage points, from 11% to 13%. The rates of other contributions were not changed, so that now social security contributions totalling 37.8%, i.e., 19.9% + 17.9%, are paid on gross monthly wages (salary). The tax on cadastral income from agriculture and forestry was abolished. A special tax rate of 20% on real estate rents was established, while the tax rate remained at 15% for other forms of income from capital. The non-taxable amount for realized individual lottery-related receipts was reduced from 26,066 RSD to 11,000 RSD. A so-called "solidarity tax" was introduced because of the "difficult situation" in public finances (net income between 60,000 RSD and 100,000 RSD was reduced by 20%, while net income above 100,000 RSD was reduced by 25%).

We analyse the fiscal system that existed in 2013 and the fiscal system in 2014, with the aim of measuring and comparing their effects on inequality in income distribution. Our research is based on original data from the HBS (2012) obtained from the Statistical Office of the Republic of Serbia. The data relate to the structure of individuals' net budgets for 2012 – data on net income and benefits for a sample of 13,155 individuals classified in 4,546 households. The unit of analysis is a household. After recalculation of the net amount into the corresponding gross amount for each individual (household), different households' income, taxes, and benefits are adapted by using the equivalence scale. In this paper we use the "modified OECD scale" adopted by Eurostat: the head of household is weighted 1, each member above 14 years of age is weighted 0.5, and children below 14 years of age are weighted 0.3. All calculations of income, personal tax, and social benefits are made according to the relevant statutory regulations for 2013 and 2014, National Assembly of the Republic of Serbia 2009; 2011; 2013a; 2013b; 2014a; 2014b.

5. RESULTS

Income distribution can be analysed when all households are divided into five equal groups and are put in order by size of pre-fiscal income (i.e., the first group includes the 20% of individuals with the lowest pre-fiscal income, while the last, fifth group includes the 20% of individuals with the highest pre-fiscal income, Table 2). In 2013 the first and second groups realized only 0.19% of total pre-fiscal income, and after paying personal taxes and receiving social benefits they realized 32.68% of total post-fiscal income. These households paid only 0.03% of the total amount of taxes and contributions, and received 68.21% of the total amount of benefits. The third group improved its financial position. It realized 10.92% of pre-fiscal income, but after redistribution it realized 13.29% of post-fiscal income. This improved position reflects the relation between taxes paid and benefits received. The third group paid only 7.38% of total taxes and contributions, and received 13.93% of total benefits. The fourth and the fifth groups worsened their financial position during the process of redistribution. Forty per cent of the richest population of Serbia realized 88.88% of total pre-fiscal income and after redistribution realized 54.04% of total post-fiscal income. The wealthiest residents paid 92.59% of the total amount of tax and contributions, and received 17.86% of the total amount of benefits. In comparison to the third group, however, the fourth and fifth groups received a higher amount of benefits.

What is the key redistributive consequence of the 2014 partial fiscal reform? The first and second groups have remained in the same position. The partial reform has primarily affected the redistribution of income between the third and fourth groups on the one hand, and the fifth group on the other. In 2014 the third and fourth groups paid 14.6% and 2.2% less tax, respectively, compared to the corresponding amount of tax paid in 2013, while the fifth group paid 2.5% more tax in 2014.

Table 2: Distribution of income, personal tax, and social benefits by group in 2013 and in 2014.

Distribution in 2013					
	1	2	3	4	5
Pre-fiscal income *(X)*	0.00	0.19	10.92	26.88	62.00
Personal taxes *(T)*	0.00	0.03	7.38	26.54	66.05
Social benefits *(B)*	34.20	34.02	13.93	11.30	6.55
Post-fiscal income *(N)*	16.31	16.37	13.29	19.54	34.49

Distribution in 2014					
	1	2	3	4	5
Pre-fiscal income *(X)*	0.00	0.20	10.64	26.70	62.46
Personal taxes *(T)*	0.00	0.03	6.30	25.95	67.72
Social benefits *(B)*	34.22	34.05	13.94	11.01	6.78
Post-fiscal income *(N)*	16.33	16.40	13.33	19.40	34.54

Note: Groups (1 - 5) are formed and put in order by the size of pre-fiscal income.
Source: Author's calculation.

Inequality in pre-fiscal income distribution has increased in the last two years, while inequality in post-fiscal income has slightly reduced (Table 3). These trends are confirmed by an increase of the Gini coefficient of pre-fiscal income, an increase of G_X from 0,6390 (2013) to 0.6422 (2014), and a decrease of the Gini coefficient of post-fiscal income, a decrease of G_N from 0.3306 (2013) to 0.3300 (2014). During the process of redistribution the redistributive effect of the fiscal system reflects the reduction in the Gini coefficient by 48.26% (2013) and by 48.61% (2014). Thus, the fiscal system significantly reduces inequality in income distribution. The result of the partial fiscal reform in 2014 is a slightly greater reduction of inequality in income distribution.

The discrepancy between the actual redistributive effect and the vertical effects measures the size of the gap between actual and potential redistribution, which amounted to 50.58% (2013) and 49.94% (2014). The focus is on the wide gap between the actual redistributive effect and the lost (potential) redistributive effect, which determines the character of the fiscal system in Serbia (Table 3). Income redistribution is primarily a result of the existence of unequal fiscal treatment of households, while the progressive feature of the fiscal system is relatively less important, which is also confirmed in the work of Wagstaff et al. (1999) and Čok (2004).

The re-ranking effect is the loss of the redistributive effect arising from the difference in the ranking of households before and after government intervention. The re-ranking effect, as an indicator of the existence of horizontal inequality, was high, 0.1560 (2013) and 0.1559 (2014). Thus, the redistributive effect of the fiscal system in 2013 (2014) would be 50.58% (49.94%) higher if there were no horizontal inequality. The re-ranking effect confirms the previous observation of the presence of differential fiscal treatments of households in Serbia. What is the cause of the position change of households (individuals) on the income scale before and after fiscal treatment? Since the annual income tax is practically ineffective,

the tax system is represented by the use of different proportional tax rates on different types of income source, and the lack of standard and nonstandard tax allowances, with the exception of the tax-free share of wages and standardized costs. Most personal income in Serbia, 80%, comes from regular employee wages. This means that the variation in tax rates and/or standard (nonstandard) allowances (costs) on other income sources has a limited effect on total horizontal inequality. Numerous types of income are exempt from the tax on salaries/wages for social reasons, but they generally have low quantitative potential. The most significant are the tax exemption of pensions and disability benefits.

Table 3: The redistributive effects of the fiscal system in 2013 and 2014

Redistributive effects in 2013		
	Value	Percentage of pre-fiscal income, G_X
G_X	0.6390	100
G_N	0.3306	51.74
RE	0.3084	48.26
	Value	Percentage of redistributive effect, RE
RE	0.3084	100
V_X	0.4644	150.58
R_X	0.1560	50.58
Redistributive effects in 2014		
	Value	Percentage of pre-fiscal income, G_X
G_X	0.6422	100
G_N	0.3300	51.39
RE	0.3122	48.61
	Value	Percentage of redistributive effect, RE
RE	0.3122	100
V_X	0.4681	149.94
R_X	0.1559	49.94

Source: Author's calculation.

We base our answer to the question of what is the individual contribution of focused fiscal instruments to the redistribution of household income in Serbia on the data in Tables 4 and 5.

Income is redistributed in relation to progressivity (regressivity) taxes and benefits (Table 4 and Table 5, Column 1). When we look at the taxes (2013), health insurance and unemployment insurance contributions are the most progressive (however, unemployment insurance contributions have low quantity potential). Since the partial fiscal reform (2014) there has been a growth in the progressivity of all tax components. Health insurance contributions and unemployment insurance contributions have remained the most progressive, while pension insurance contributions have taken third place, 'pushing' personal income tax into fourth position. Pensions are incomparably the most regressive among all components of social benefits. They create a redistribution of income in Serbia, i.e., their redistributive impact is the greatest.

Serbia is characterized by low taxes, significant (and increasing) social contributions and, above all, high and increasing social benefits, when observing comparable levels and relations in 2013 and 2014 (Table 4 and Table 5, Column 3). For 2013 and 2014, respectively, equivalent adults pay, on average, 7.97% and 6.63% of their pre-fiscal income as taxes and 25.63% and 26.18% as social security contributions, and they receive, on average, 60.52% and 61.37% of their pre-fiscal income as social benefits. Thus, the total redistributive effect induced by the partial fiscal reform in 2014 is a reduction in the average tax paid from 33.59% (2013) to 32.81% (2014), and an increase in the average benefits received from 60.52% (2013) to 61.37% (2014).

Individual redistributive contributions to the overall vertical effect are unevenly distributed between taxes and benefits (Column 4 and Column 5). In 2013 (Table 4) social benefits initiated 97.99% of the redistributive effect, of which pensions generated 94.44%, followed by means-tested social benefits with 2.76% and non-means tested social benefits with 0.81%. Pensions are the single most important instrument in income redistribution in Serbia. On the other hand, personal taxes initiated 2.01% of the redistributive effect, of which contributions for pension insurance alone make up 0.83% of the redistributive effect, as well as non-means tested social benefits, while personal income tax produces half of that amount (0.44%) and occupies the penultimate, sixth place in the rankings, ahead of the negligible share of unemployment contributions (Table 4, Column 6).

Partial fiscal reform (2014) has not changed the order of ranked instruments (Table 5, Column 6). The basic characteristic of the partial fiscal reform is the change in the components of personal tax. The redistributive capacity of personal income tax was reduced in 2014 (to 0.36% of vertical effect), and the capacity of pension insurance contributions was increased (to 1.13%).

Table 4: Decomposition of the vertical effect in 2013

	$D_{T_i;X}$	$D_{T_i;X} - G_X$	t_x^i	$\lambda_{T_i;X}$	$\lambda_{T_i;X}$ *(%V)*	$\lambda_{T_i;X}$ *(rank)*
	1	2	3	4	5	6
Personal income tax, P	0.6705	0.0315	0.0797	0.0020	0.44	6
Social security contributions for pension insurance, D_p	0.6690	0.0300	0.1627	0.0038	0.83	3
Social security contributions for health insurance, D_z	0.6861	0.0471	0.0834	0.0031	0.67	5
Social security contributions for unemployment insurance, D_n	0.6861	0.0471	0.0102	0.0004	0.08	7
Personal taxes, T	0.6741	0.0351	0.3359	0.0093	2.01	
	$D_{B_j;X}$	$G_X - D_{B_j;X}$	b_x^j	$\lambda_{B_j;X}$	$\lambda_{B_j;X}$ *(%V)*	$\lambda_{B_j;X}$ *(rank)*
	1	2	3	4	5	6
Pensions, Z	(0.3268)	0.9658	0.5764	0.4386	94.44	1
Means-tested social benefits, $S_{1.1.}$	(0.1172)	0.7562	0.0215	0.0128	2.76	2
Non-means-tested social benefits, $S_{1.2.}$	(0.0172)	0.6562	0.0072	0.0037	0.81	4
Social benefits, B	(0.3154)	0.9544	0.6052	0.4551	97.99	

Note: *(%V)* = percentage of vertical effect.
Source: Author's calculations.

Table 5: Decomposition of the vertical effect in 2014

	$D_{T_i;X}$	$D_{T_i;X} - G_X$	t_x^i	$\lambda_{T_i;X}$	$\lambda_{T_i;X}$ *(%V)*	$\lambda_{T_i;X}$ *(rank)*
	1	2	3	4	5	6
Personal income tax, P	0.6743	0.0321	0.0663	0.00	0.36	6
Social security contributions for pension insurance, D_p	0.6817	0.0395	0.1720	0.0053	1.13	3
Social security contributions for health insurance, D_z	0.7018	0.0596	0.0800	0.0037	0.79	5
Social security contributions for unemployment insurance, D_n	0.7018	0.0596	0.0098	0.0005	0.107	7
Personal taxes, T	0.6857	0.0435	0.3281	0.0111	2.38	
	$D_{B_j;X}$	$G_X - D_{B_j;X}$	b_x^j	$\lambda_{B_j;X}$	$\lambda_{B_j;X}$ *(%V)*	$\lambda_{B_j;X}$ *(rank)*
	1	2	3	4	5	6
Pensions, Z	(0.3261)	0.9683	0.5845	0.4403	94.05	1
Means-tested social benefits, $S_{1.1.}$	(0.1174)	0.7596	0.0218	0.0129	2.76	2
Non-means -tested social benefits, $S_{1.2.}$	(0.0186)	0.6608	0.0073	0.0038	0.81	4
Social benefits, B	(0.3150)	0.9572	0.6137	0.4569	97.62	

Note: *(%V)* = percentage of vertical effect.
Source: Author's calculations.

6. COMPARISON OF THE RESULTS OF VARIOUS STUDIES

The results of our research can be compared with the results of the methodologically similar empirical studies of Kim and Lambert (2009) and Urban (2008). Although there are some differences in coverage and definitions

of the used fiscal instruments, comparison of the results provides insight into the level and structure of changes in income inequality in the USA, Croatia, and Serbia.

Kim and Lambert (2009) measured the redistributive effect of taxes and benefits for the United States using Current Population Survey data (CPS). Kim and Lambert's conclusions mostly agree with the results of our empirical research regarding basic redistributive tendencies. The key differences are significant: a much smaller redistributive effect of the U.S. fiscal system (31.72%), a lower proportion of benefits, and a much higher proportion of taxes in the vertical redistribution (equivalent adults pay on average 22.8% of their pre-fiscal income in tax and receive 21% as benefits; 88% of the vertical redistribution was initiated by benefits, and 12% was initiated by taxes), and a significantly lower re-ranking effect (35%).

Urban (2008) conducted a study of the redistributive effects of social security contributions, personal income tax, state pensions, and cash social benefits (means-tested and non-means-tested) for Croatia. Comparing the results of the research is interesting because of the similar institutional and developmental characteristics of Croatia and Serbia. The fiscal system reduces income inequality by 40.0%, as the Gini coefficient decreases from 0.5144 to 0.2963 during the transition from pre-fiscal to post-fiscal income. So, inequality in pre-fiscal income and inequality in post-fiscal income are more pronounced in Serbia, while the Serbian fiscal system reduces income inequality more significantly. Re-ranking in the Croatian system is relatively high, but is considerably lower than in Serbia and the USA: the redistributive effect in Croatia would be 25% higher if there were no re-ranking. Similar to our data for the decomposition of vertical redistribution, state pensions are the main factor in reducing inequality. Pensions, personal income tax, and social security contributions are the three key components that reduce inequality. Pensions initiate more than 80% of vertical redistribution, followed by personal income tax with 5.5%, and social security contributions with 5.3%.

Compared to countries of a similar and/or higher level of development, income tax in Serbia contributes to the reduction of inequality to a relatively small degree. Why? In our opinion, this is primarily due to the following tax (fiscal) characteristics of Serbia. 1) The way in which individuals' income is taxed. The size of the zero tax bracket, the tax level, and the size of the standard (nonstandard) allowances (costs) should be adjusted to make personal taxation more progressive, focusing on changes in income structure and taxpayer structure to increase/

decrease the number of tax payers with high/low incomes. 2) The prevalence of fiscal goals over the original, tax goal. Personal income tax was reduced in order to solve the problem of the retirement security fund on the one hand and the problem of fiscal decentralization on the other hand. 3) The tax-free status of state pensions. If the tax status of pensions were changed and pensions were regarded as taxable money income rather than a social benefit, attitudes toward the contribution of the observed fiscal instruments to the total redistributive effect would change.

6. CONCLUSION

Fiscal systems (policy) are primarily directed towards efficient resource allocation and equitable income distribution. The state has two central tasks: to reach an efficient system of income and expenditure that minimizes the excess burden, and a tax-benefit structure in accordance with the demands of horizontal and vertical equality. The idea of defining the tax (benefit) structure in accordance with the demands of horizontal and vertical equality can be found in the works of numerous authors since the Middle Ages. Economists, politicians, and philosophers realised the importance of taxes and benefits and searched for the principles on which a tax system and a public transfer system should be based. The structure of the state is based on the entitlement to levy taxes, thus giving taxation a destructive power if tax size is not proportional to available social wealth and is not allocated equitably. This paper considered the interaction of the chosen instruments of the fiscal system and the distribution and redistribution of income in the Republic of Serbia.

This paper researched the redistributive effects of the fiscal systems established in Serbia for 2013 and 2014. The key results are:

Inequality in pre-fiscal income distribution increased in 2013 and 2014, and inequality in post-fiscal income was slightly reduced.

In 2013 the fiscal system reduced income inequality by 48.26%: the Gini coefficient fell from 0.6390 to 0.3306 while moving from pre-fiscal towards post-fiscal income. The result of the 2014 partial fiscal reform is a slightly greater reduction in income inequality (48.61%).

Income redistribution in Serbia is primarily the result of differential fiscal treatment of households, and the progressive feature of the Serbian fiscal system is of relatively less importance.

The fiscal system from 2013 (2014) would be more redistributive by 50.58% (49.94%) if there were not horizontal inequality.

In 2013 and 2014, respectively, the equivalent adults paid, on average, 7.97% and 6.63% of their pre-fiscal income in taxes and 25.63% and 26.18% in social insurance contributions, and received, on average, 60.52% and 61.37% of their pre-fiscal income as social benefits. The total redistribution effect of the 2014 partial fiscal reform is an average reduction in taxes paid, from 33.59% (2013) to 32.81% (2014), and an average increase in benefits received, from 60.59% (2013) to 61.37% (2014).

The vertical effect is disproportionally divided between social benefits and personal taxes, 97.99%:2.01% (2013).

The Social benefits were responsible for 97.99% of vertical redistribution (2013) and pensions for 94.44%, followed by means-tested social benefits with 2.76% and non-means-tested social benefits with 0.81%. Pensions are the most important instrument of income redistribution in Serbia.

In 2013 personal taxes were responsible for 2.01% of vertical redistribution, of which social insurance contributions constituted 1.58%. Pension insurance contributions and non-means-tested social benefits constituted 0.83% of social insurance contributions, whereas personal income tax constituted half that (0.44%) and took sixth, penultimate place in the ranking list, before the negligible share of unemployment contributions.

State pensions, means-tested social benefits, and social security contributions contribute most to the reduction of inequality in the Republic of Serbia (2013). The 2014 partial fiscal reform did not change the ranking of the analysed fiscal instruments.

Most of the total redistributive effect was initiated by state pensions.

The advantages of this paper are the representative sample and the standard methodology of valorising the redistributive effect of the fiscal system, i.e., the focused fiscal instruments, of the Republic of Serbia. The disadvantage of this

paper is its partial approach, in that the empirical research did not cover the effects of other fiscal instruments. This kind of research is rare in Serbia. Once the limitations are overcome, the presented results can be used to initiate new research into the vertical, horizontal, and re-ranking effects of the Republic of Serbia's fiscal system.

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