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# Impact of personal income tax changes on citizens' tax burden

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*In an effort to ensure more equity in personal income taxation, the Croatian Government adopted a new, amended Personal Income Tax Act that entered into force on 1 March 2012<sup>1</sup>. The new amendments should provide a basis for increasing the net income for lower income categories and reducing the net income for higher income groups<sup>2</sup>. As a result of increasing the personal allowances and of changes in tax brackets (Table 1), the general government budget revenues are expected to fall by about HRK 340 million annually, thus increasing the disposable income of households.*

*Moreover, the Government has introduced a new taxable income category, i.e. dividends and profit sharing proceeds, as well as a tax on the pension supplement, which now becomes part of the pension. It has also introduced the taxation of foreign pensions in the same manner as domestic pensions. The purpose of these measures is to increase tax revenues by about HRK 290 million.*

**Table 1**  
*Changes in personal allowance and tax brackets (in HRK)*

	Old scheme	New scheme
Personal allowance	1,800	2,200
Taxable income per tax rate (%)		
12	0-3,600	0-2,200
25	3,600-10,800	2,200-8,800
40	> 10,800	> 8,800

Source: OG 22/12.

<sup>1</sup> The Personal Income Tax Act (OG 177/04, 73/08, 80/10, 114/11 and 22/12).

<sup>2</sup> Income is considered to be the income after the payment of mandatory contributions and before the payment of personal income tax and surtax, whereas net income is the amount remaining after the payment of personal income tax and surtax.

*The expected consequence of these legislative changes is a reduction in tax revenues by about HRK 50 million. The following analysis will try to establish whether these changes will meet Government expectations and who the winners and losers are in the new tax scheme.*

## 1 A TAX BURDEN ANALYSIS

In this part of the analysis, we use hypothetical data on the incomes of individuals from groups A and B. We assume that they only receive income from salary, and that individuals from group A only receive the basic personal allowance, whereas individuals from group B receive both the basic and additional personal allowances for two dependent children. The amount of the additional personal allowance for two children is obtained by multiplying the basic personal allowance by the personal allowance factor which is 1.2 for two children (0.5 for the first child and 0.7 for the second child). The resulting amount is HRK 2,160 under the old tax scheme (OS), or HRK 2,640 under the new tax scheme (NS). Both groups pay surtax at a rate of 18%. Average tax rates (ATRs) for individuals from groups A and B are calculated under the old and the new scheme, and the obtained results are compared. The ATR indicates the percentage ratio between tax<sup>3</sup> and income. Graph 1 shows that in both cases, ATR increases with income, which means that the personal income tax burden is heavier for higher-income taxpayers, i.e. that the tax system is progressive<sup>4</sup>.

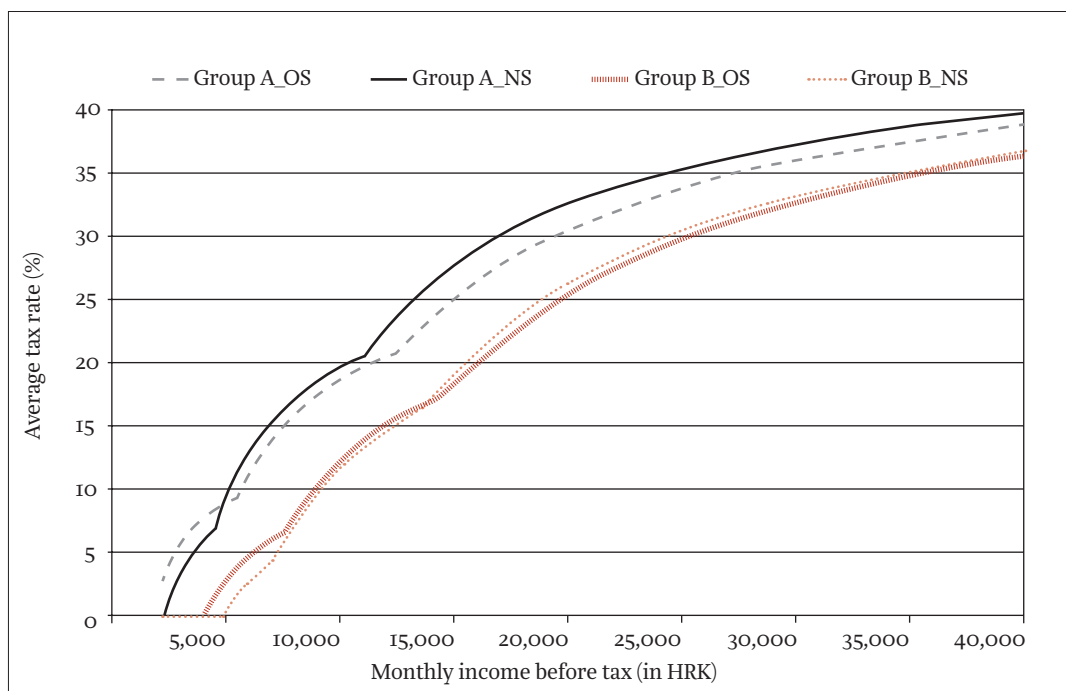
It is further shown that ATR is higher for individuals from group A for each level of income, because individuals

<sup>3</sup> In this paper, personal income tax and surtax will be briefly called 'tax'.

<sup>4</sup> For more about the personal income tax progressivity, see Urban (2006).

## Graph 1

Average tax rate as a function of income



Source: Author's calculation.

from group B receive higher personal allowance. The ATR curves under the old and new systems for group A intersect at an income of HRK 4,800. At that level, the ATR is 8.9%, which means that this percentage of income goes to the government. For incomes below 4,800, the ATR is lower by about 2 percentage points under the new scheme. By contrast, for incomes above HRK 4,800, the ATR is higher under the new scheme, by about 2 percentage points for incomes between HRK 4,800 and HRK 12,500. The largest increase, by about 3 percentage points, is observed for incomes between HRK 12,500 and HRK 15,000. As income grows, the difference between the ATRs under the old and new schemes gradually decreases, standing at 0.95 percentage points for an income of 40,000.

For individuals from group B, the ATR under the new scheme is lower for incomes below HRK 13,900, while for incomes above that limit the ATR goes up. The sharpest differences in ATRs between the old and new schemes have been observed for lower levels of income. Thus, for incomes between HRK 4,500 and HRK 7,000, the ATR under the new scheme is lower by about 2 percentage points. For higher incomes, the difference in ATRs decreases and becomes negligible, to the income of about HRK 13,900 for which the ATRs become equal under both schemes, and amount to 17.1%. For incomes between HRK 13,900 and HRK 20,000, the ATR under the new scheme increases by about 1 percentage point. A further increase in income leads to the narrowing of that difference, so that, for an income of HRK 40,000, it amounts to 0.38 percentage points.

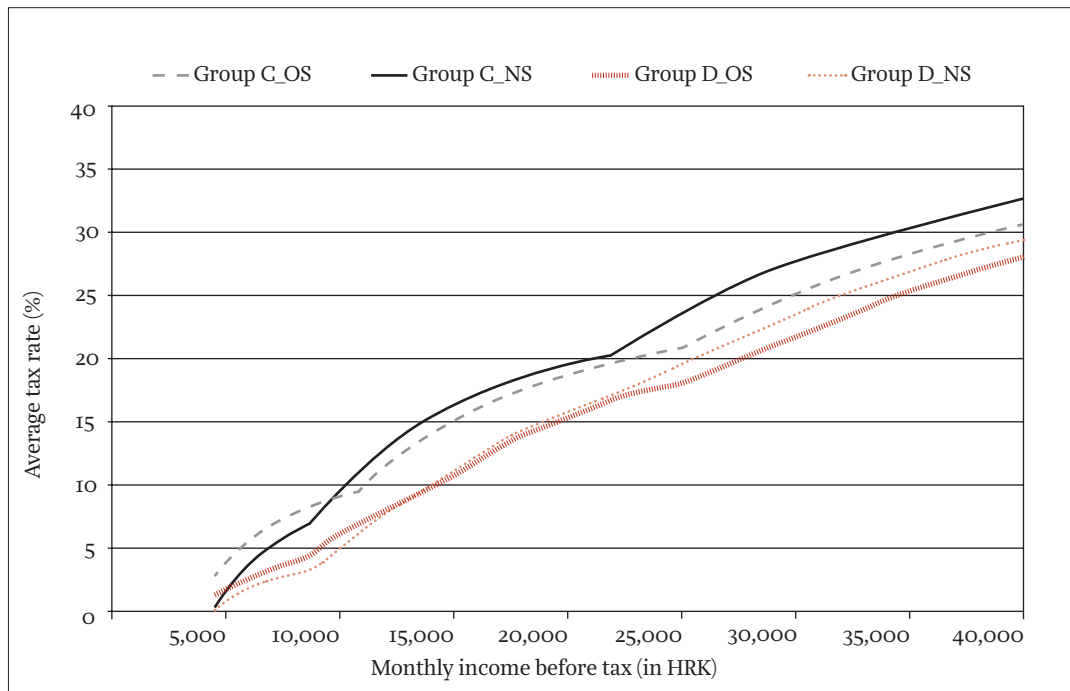
For a more realistic picture, Graph 2 provides a comparison of ATRs under the old and the new scheme for group C and group D households. Group C households include two employed adults, whereas group D households consist of two employed adults plus two dependent children. It is assumed that both adults in each household are employed and receive equal incomes, which, added together, represent the total household income. Graph 2 shows that the ATR for group C is higher than that for group D under both the old and new schemes, because one adult member of each group D household receives additional group D household members, having no children, only receive the basic personal allowance.

A comparison between ATRs under the old and new schemes for group C households is similar to that for group A, because Group C households actually consist of two individuals from group A. For that group, the ATR for incomes below HRK 9,600 is about 2 percentage points lower under the new scheme. For incomes above HRK 9,600, the ATR under the new scheme is higher, by about 2 percentage points at an interval between HRK 9,600 and HRK 24,500, and by about 3 percentage points at an interval between HRK 24,500 and HRK 30,000. A further increase in income leads to a gradual decrease in the difference between ATRs under the old and the new scheme.

The income analysis of group D households shows a decrease in the ATR by about one percentage point under

## Graph 2

A comparison between average tax rates for two households



Source: Author's calculation.

the new scheme, for incomes below HRK 10,500, while approximately equal ATRs are observed at an interval between HRK 10,500 and HRK 22,400. For incomes above HRK 14,400, the ATR under the new scheme is higher than that under the old scheme, whereas an increase of more than one percentage point is recorded for incomes above HRK 24,000.

## 2 DISTRIBUTION OF TAX BURDENS

This part analyses the distribution of tax burdens under the old and new schemes. Based on the Household Budget Survey (HBS) results for 2008<sup>5</sup>, and using a microsimulation model, the amounts of tax under the old scheme applied in 2011, and a new one, being in force since 1 March 2012 are calculated and compared. Households are first ranked by their total monthly income per household member, and then divided into ten groups with equal numbers of individuals (decile groups).<sup>6</sup>

Table 2 shows average amounts of different items per household member. The first column contains income class limits for each decile group, the second one shows the total monthly income averages and the third column shows the non-taxable portion of income. The fourth and fifth columns provide average personal income tax

<sup>5</sup> The 2008 HBS (conducted by the Central Bureau of Statistics) provides the amounts of income before tax.

<sup>6</sup> The HBS captures annual data, but, for better understanding, these annual data are expressed at a monthly level, by dividing the annual amount into 12 monthly amounts.

amounts, calculated by means of a microsimulation model under the old and the new scheme. The last column shows the amount of the change caused by introducing the new tax scheme. The positive sign indicates an increase and the negative sign a reduction in tax liability.

Table 2 shows a reduction in tax liability under the new scheme for the first eight decile groups representing 80% of the population. For the ninth decile group, the tax liability increased only slightly, by HRK 4 per household member, while the tenth decile group, having the highest income, bears the heaviest burden of the tax liability increase, HRK 86 per household member. The overall effect is a slight increase in tax liability, which is contrary to the Government's assumption that tax revenues would fall. Such parallel results are probably due to the use of different data sources.

Table 3 shows the shares of individual decile groups in income and tax. Column 2 shows the share of each decile group<sup>7</sup> in the total income of the entire population. Columns 3 and 4 show the shares of tax paid by each decile group in total tax. Columns 5 and 6 indicate the ATR for each decile group. As shown by column 2, the tenth decile group owns one fourth of the total population's income, whereas the first five decile groups together earn as little

<sup>7</sup> The share in total income for each decile group is calculated according to the following formula: income for an individual decile group / total income of the entire population x 100.

**Table 2**

Average monthly amounts of income and tax per household member (in HRK)

Decile group	Income (class limits)	Average income	Non-taxable portion of income	Personal income tax		Change in tax liability
				Old scheme	New scheme	
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6=5-4</b>
I.	0-1,137	831	303	1	0	-1
2.	1,137-1,515	1,327	330	4	2	-2
3.	1,515-1,817	1,672	360	12	6	-6
4.	1,817-2,097	1,967	303	29	20	-9
5.	2,097-2,376	2,236	356	44	31	-13
6.	2,376-2,693	2,534	306	68	52	-16
7.	2,693-3,169	2,912	415	104	88	-16
8.	3,169-3,805	3,473	402	173	162	-11
9.	3,805-4,852	4,268	404	314	318	+4
10.	> 4,852	7,366	859	1,006	1,092	+86
<b>Total</b>		<b>2,859</b>	<b>404</b>	<b>175</b>	<b>177</b>	<b>+2</b>

Source: Author's calculation based on the 2008 Household Budget Survey, using a microsimulation model.

**Table 3**

Shares in income and tax by decile groups (%)

Decile group	Income (class limits, in HRK)	Share in			Average tax rate	
		total income	total tax		Old scheme	New scheme
			Old scheme	New scheme		
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
I.	0-1,137	2.90	0.04	0.02	0.08	0.04
2.	1,137-1,515	4.64	0.21	0.09	0.28	0.11
3.	1,515-1,817	5.84	0.70	0.32	0.74	0.34
4.	1,817-2,097	6.87	1.66	1.11	1.48	1.00
5.	2,097-2,376	7.80	2.51	1.72	1.97	1.37
6.	2,376-2,693	8.89	3.86	2.95	2.67	2.06
7.	2,693-3,169	10.16	5.89	4.92	3.57	3.01
8.	3,169-3,805	12.15	9.85	9.15	4.98	4.67
9.	3,805-4,852	14.89	17.82	17.90	7.36	7.46
10.	> 4,852	25.86	57.46	61.82	13.65	14.83
<b>Total</b>		<b>100</b>	<b>100</b>	<b>100</b>	<b>6.15</b>	<b>6.20</b>

Source: Author's calculation based on the 2008 Household Budget Survey, using a microsimulation model.

**Table 4**

Average monthly amounts of income and tax per household member for the tenth decile group (in HRK)

Subgroup	Income (class limits)	Average income	Non-taxable portion of income	Personal income tax		Change in tax liability
				Old scheme	New scheme	
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6=5-4</b>
10.1.	4,852-5,273	5,083	492	479	501	+22
10.2.	5,273-5,878	5,519	657	500	531	+31
10.3.	5,878-6,967	6,344	671	695	758	+63
10.4.	6,967-8,670	7,660	809	973	1,086	+113
10.5.	> 8,760	12,185	1,663	2,372	2,574	+202
<b>Group</b>	<b>&gt; 4,852</b>	<b>7,366</b>	<b>859</b>	<b>1,006</b>	<b>1,092</b>	<b>+86</b>

Source: Author's calculation based on the 2008 Household Budget Survey, using a microsimulation model.

**Table 5***Shares in income and tax for the tenth decile group (%)*

Subgroup	Income (class limits, in HRK)	Share in			Average tax rate	
		total income	total tax		Old scheme	New scheme
			Old scheme	New scheme		
	1	2	3	4	5	6
10.1.	4,852-5,273	3.6	5.5	5.7	9.4	9.9
10.2.	5,273-5,878	3.9	5.7	6.0	9.1	9.6
10.3.	5,878-6,967	4.4	7.9	8.6	11.0	12.0
10.4.	6,967-8,670	5.4	11.2	12.4	12.7	14.2
10.5.	> 8,760	8.6	27.2	29.2	19.5	21.1
<b>Group</b>	> 4,852	25.9	57.5	61.8	13.7	14.8

Source: Author's calculation based on the 2008 Household Budget Survey, using a microsimulation model.

as about 28% of total income. Columns 3 and 4 suggest that the highest-income decile group bears most of the tax burden. This group's share in total tax additionally increased by 4.36 percentage points, so that it now pays almost 62% of total tax. By contrast, the lower nine decile groups together pay the remaining 38% of total tax. The share of all the eight decile groups in total tax decreased by less than one percentage point, while the share paid by the ninth decile increased by 0.08 percentage points. Accordingly, the most substantial changes occurred to the richest tenth of the population.

Due to the open character of the tenth decile group,<sup>8</sup> the results for this richest tenth of the population will be presented in greater detail. Households within the tenth decile group are further divided into five subgroups according to the ascending total monthly income per household member. As suggested by Table 4, demonstrating changes in tax liabilities, the tax liability changed for each subgroup. For each of the first three subgroups, the increase in tax liability is smaller than the total increase for the entire group (HRK 86), while for incomes larger than HRK 8,760, the increase in tax liability amounts to HRK 202.

Table 5 shows a slight decrease in ATRs for the second subgroup, because of a difference of HRK 165 in the non-taxable income per household member from the previous subgroup, and because of insufficient data. The ATR for each following subgroup increases from the previous one, standing at 21.1% for the fifth subgroup, 1.6 percentage points more than under the old scheme. The fifth subgroup, consisting of 2% of highest-income individuals, has earned 8.6% of total income of the population, but it pays more than one fourth of the total tax under both the old scheme (27.2%) and the new scheme (29.2%).

<sup>8</sup> The tenth decile group is said to be „open” because it includes all incomes larger than HRK 4,852. In other words, the differences between incomes per household member within this group are the sharpest, because the highest income is unknown.

### 3 CONCLUSION

Is the new tax scheme more equitable than the old one? The answer depends on whether changes are observed from the perspective of individuals with lower or with higher incomes. The tenth of the population with the highest income per household member certainly perceives the new scheme as less equitable, because, as before, this population group pays more tax than all other groups together. As shown in the last column of Table 3, almost 15% of this group's income is spent on tax payment, 1.17 percentage points more than under the old scheme. However, the impact of the additional tax burden on citizens was expected, as the new act was aimed at increasing net incomes of lower-income population groups, and reducing the net incomes of better-off citizens. Table 2 shows that the new scheme produces no major increase in the net incomes of the poorest 20% of the population, because, given small incomes, their tax liabilities used to be low before as well. Given the largest decrease in tax liability (by HRK 16 per household member) for the sixth and seventh decile groups (incomes between HRK 2,376 and HRK 3,169), these groups seem to have benefited the most from the new scheme. The new tax scheme is obviously not going to increase the incomes of the poorest population groups. Hence, the government could provide better assistance to these groups through social transfers and child benefit.

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