

Csaba Tóth G. – Péter Virovác

Winners and Losers

An assessment of the Hungarian flat tax reform with microsimulation

SUMMARY: In our paper, we have used a database of tax returns from 2011 to assess how the tax reform, implemented in personal income taxation between 2010 and 2013, affected the tax burden of certain social groups and what implications the reforms had on the public finances. Our research follows the principles of positive economics using a static microsimulation model. Our findings reveal that the tax reform reduced government revenues by an annual total of HUF 444 billion. 74 per cent of this amount increased the net income of childless taxpayers in the top two income deciles. Although 63 per cent of the taxpayers with three or more dependent children are winners of the tax reform, in the bottom six income deciles tax liabilities of taxpayers with three or more children have not decreased markedly. Overall, we can conclude that it was income rather than the number of children which primarily affected the tax liabilities of private persons after the implementation of the tax reform. Reducing the tax rate to 9 per cent would result in a further 44 per cent decrease of budget revenues from personal income tax, which – on the basis of the 2011 data – would mean a loss of an additional HUF 522 billion of tax revenues on an annual basis.

KEYWORDS: personal income tax, microsimulation, budget, redistribution, flat tax

JEL CODES: H23, H24, I38, D31

Over the past years, the Hungarian tax system has been transformed substantially. This meant the introduction of new taxes as much as the frequent modification of the rules of existing ones. A symbolic element of such tax changes was the reform of the personal income taxation, which the government implemented over a period of three years, between 2010 and 2013. In addition to merging and reducing tax rates, the restructuring, publicly known as the flat tax reform, also included the abolition of the super grossing system, the phasing out of tax credits, and the major expansion of the existing family tax allowance scheme.

The issue deserves and is paid all the more attention as personal income taxation is

closely linked to several other government functions. It contributes nearly 15 per cent of all tax revenues to the funding of public expenditures. Compared to most taxes, it has a primary role in state redistribution as well. Moreover, it may also contribute to macroeconomic stability through its potential progressivity, operating as an automatic stabiliser (Tóth, 2010).

For these reasons, it is worth examining in detail what consequences the transformation of the Hungarian personal income taxation has (had). Of all the dimensions which may be and are worth being examined, our study primarily focuses on two closely related aspects. The objective of our study is to precisely map, quantify and describe the impact of the flat tax reform on the tax burden of certain

E-mail address: tothgcs@gmail.com

social groups, the consequent changes in income distribution in Hungary between 2010 and 2013, as well as the implications of the reform for the budget. Moreover, we have applied similar aspects to examine what consequences a reduction of the currently effective tax rate of 16 per cent to 9 per cent would have, knowing that this possibility has been discussed among the long term plans of the government.

It must be emphasised that the proportion of tax burdens imposed on different social classes is primarily a value choice and not an issue of economics.¹ On the other hand, income tax is only one instrument among the many instruments of state redistribution, and as such, it may not in itself be used to assess state redistribution. Therefore, our research objective was not to give an evaluation of the tax policy, but to describe the results induced by the change along two highlighted dimensions. Our analysis follows the logic of positive economics, as we strive to focus on the description of the operation and behavioural relationships of a particular economic system. As *Erdős* (2012) puts it, this type of study, as opposed to normative economics, never expresses value judgements, but offers a description of a particular system, explaining how it functions and defining what reactions it may be characterised by.

Following an introduction, the second part of the study gives an overview of international experiences, while in the third part we review research studies relating to the Hungarian tax system. Subsequently, we shall briefly describe the methodology of the analysis, and present our findings. In the first step, the tax reform is considered as a whole, and then the effects of the certain measures are decomposed separately. Finally, we provide an assessment of the potential consequences of the introduction of a single digit (9 per cent) tax rate.

INTERNATIONAL EXAMPLES AND EXPERIENCE

The implementation of a flat rate personal income tax is by no means unprecedented in the European Union; there are several member states using this type of tax system for some time.² On the continent, the successor states of the Soviet Union were the first to introduce a flat rate personal income tax: Estonia and Lithuania in 1994 and Latvia in 1997. Of the Visegrád countries, Hungary followed Slovakia (2004) and the Czech Republic (2008) in 2011.

The proliferation of the flat rate tax is closely related to the fact that the tax reforms implemented in the countries of the European Union over the past decades have been designed to serve three major purposes: to reduce taxes on labour, to gain advantage from the price competition arising from globalisation and to simplify taxation. The latter has been most apparent in measures which combine the reduction of tax rates and the expansion of the tax base (*Kiss et al.*, 2008). While the flat tax reform, typical only of Central and Eastern European countries, is indeed in line with these efforts, Western European states have chosen to adopt changes in their progressive tax systems to match the trends.

When examining the determinants underlying such changes, one must take note of the study of *Pires and Jensen* (2011) which concludes that the distorting effect of flat tax systems on economic processes may be smaller compared to multiple rate schemes, where the effect takes hold through multiple channels. First, there is a stronger incentive effect as revenues increase in proportion to productivity as a result of the smoothing out of the marginal tax rate. Second, the simplification of the tax system entails lower tax planning costs for employees, employers and the government alike, thus it improves efficiency both directly

and indirectly. Moreover, the study highlights that a flat tax reform may boost entrepreneurship and may positively impact foreign operating capital inflow.³

Accordingly, governments tend to expect the implementation of a flat tax system to induce the expansion of labour supply, the reduction of tax evasion and the decrease of administrative costs (Kiss et al., 2008). Nevertheless, there is very little robust empirical evidence for a valid assessment of the reforms. The assessment of changes is made all the more difficult as the implemented flat tax systems do differ in several aspects, thus the effects of flat tax systems cannot be described in general (Keen et al., 2006).

The most widely proclaimed positive outcome is that tax evasion may indeed be reduced, as it was pointed out in the paper of *Ivanova et al. (2005)* in relation to the Russian tax reform. *Saavedra (2007)* also concluded that flat tax reforms may improve taxation morale provided that the reform is accompanied with the simplification of the tax administration. The author also claims that a flat tax reform may positively impact the competitiveness and the growth of the economy. Those who emphasise the growth impact of the tax reform mainly refer to the Baltic States and Slovakia as examples: these countries saw a prompt and steady growth of the GDP after they implemented a flat tax system. However, *Erdős (2012)* warns that growth may not exclusively be the result of the tax reforms, but there were several other factors which also contributed to the acceleration of the expansion. The recovery period following the major economic recession in the years preceding the reform, other economic policy measures, the level of development of labour markets and the foreign operating capital inflow all have contributed to the recovery, offering a stimulus to these economies to a greater extent than the tax reform, *Erdős (2012)* claims.

Based on a detailed examination of countries which implemented flat tax regimes, *Kiss et al. (2008)* also came to the conclusion that reforms did not clearly deliver the results they were expected to bring about in terms of growth and tax revenues.⁴ Nevertheless, there was a certain side-effect related to the redistribution of incomes in all the cases. According to the authors, there may be ways to improve the efficiency of a tax system at a lower social cost.⁵

The popularity of flat tax systems seems to wane these days, which is well reflected in the changes adopted, or postponed for that matter, in two of the Visegrád countries. While in 2008 Poland was considering the possibility to transform their classical progressive taxation into a flat tax system, the economic crisis has clearly swept away these endeavours. In Slovakia the government abolished the flat tax system in 2013 by adopting a second, 25 per cent tax rate in addition to the existing 19 per cent rate. The concept of differentiated income taxation arose in our Eastern neighbour, Romania, as well, in 2012. To help lower-income taxpayers, the government was planning to add two lower personal income tax rates (8 and 12 per cent) to the existing 16 per cent rate into the flat tax system the country implemented in 2005.⁶ This, however, is not feasible in the current budget situation, so its implementation is most certainly not going to happen this year.⁷

LESSONS LEARNED FROM HUNGARIAN PROFESSIONAL LITERATURE

Although Hungary adopted a flat tax system in 2011, there have been several studies on the very same subject matter since the mid 2000s. *Benedek and Lelkes (2006)* examined income redistribution in Hungary, and considered the possible effects of a flat tax system as early as five years before the tax reform was indeed implemented. Similarly to the present paper,

their research focused on the redistribution impact of a flat rate tax. The parameters they applied in their hypothetical tax system relied on the fundamentals of the Slovakian tax reform, but they chose to model a simpler system: personal income tax and value-added tax rates were set at 20 per cent, they retained the tax credit system, but abolished all other tax allowances. The research findings revealed that – not considering the top quintiles of income distribution – personal income tax liabilities would not change significantly. It would, nevertheless, considerably reduce the tax burden on the wealthiest. At the same time, the VAT payable would be larger in all deciles due to the unification of the VAT rate. As a combined result of these two factors, the beneficiaries of the tax reform would be higher-income taxpayers, while the losers would be lower-income individuals. With such a hypothetical tax system 15–15 per cent of the households would gain or lose, in comparison to the tax regime of 2006. Winners would be mainly those in the top deciles, while the proportion of losers would be over 10 per cent in all deciles, but their distribution would be the highest in the middle range. The final conclusion of the paper is that such a tax system would reduce the redistribution of income and would thus deteriorate social solidarity.

The study of *Bakos et al.* (2008a) also focused on the assessment of income distribution effects. Additionally, the authors also sought to answer the question of how much growth and revenue effects of flat tax reforms correlate with the change of tax rates and how much with a more stringent tax collection policy. The findings of their empirical research revealed that with 0.06 the ratio of overall tax elasticity is relatively low in Hungary, which implies that a reduction of the marginal tax rates would produce a lower than expected economic stimulus. Nevertheless, with a value

exceeding 0.3, the behavioural impact (elasticity) is higher in the wealthier segment, which suggests a possibility for a considerable growth of labour supply.⁸ According to the authors, this however, amplifies the redistribution effects of the flat tax reform. From their simulation of a flat rate personal income tax system, they concluded that as a result of the behavioural impact, budget revenues and taxable income would grow by a moderate 2 and 1.4 per cent, respectively.⁹ At the same time, such a reform would cause major changes in income distribution, the burden of which would primarily be borne by taxpayers with medium income.

Similarly to our study, the research of *Benczúr et al.* (2011a) focused not (only) on a hypothetical tax reform, but on one which was actually implemented. In their paper they used a microsimulation model, expanded with behavioural impact, to quantify anticipated long term labour market, growth and budget effects. The change made to the tax system in 2011¹⁰ triggers a 2.6 per cent increase in long term labour supply, while its impact on employment is negligible. According to the authors' estimates, the balance of the budget will deteriorate by HUF 93 billion as a result of the measure, while GDP is expected to grow by 2.4 per cent. Growth appeared to be a few percentage points higher (2.9 per cent) when the authors took into consideration the full-scale removal of super grossing and tax credits, an additional one percentage point increase of the contribution and the increase of the VAT. The whole package would improve the balance of the budget by HUF 212 billion, but the number of persons employed would decrease by 0.8 per cent.

Erdős (2012) studied the short term effects of the flat tax and other, simultaneous economic policy measures (banking and crisis taxes, schemes designed to aid foreign currency debtors). One of the most important assumptions

of the study is that the weaker than expected economic stimulus may be traced back to both the demand and the supply sides. On the demand side, the problem Erdős (2012) identifies is that the net income growth of wealthier individuals does not end up in internal demand but significantly increases import demand.¹¹ The study also concludes that while the savings of wealthier taxpayers seem to be sensitive to changes in the tax system, the aggregate savings in the country failed to grow. Now as a result, the budget deficit grows by an amount corresponding to the surplus income of the wealthy population from the tax measures. On the supply side, Erdős (2012) highlights the limiting effect of other economic policy measures. The study traces back the moderate employment (supply) impact to the fact that supplementing economic policy measures, adopted to offset the deficit increasing effect of tax cuts, undermined the banking system's willingness to lend.

Cseres – Gergely and Simonovits (2011) examined how the transformation of the personal income tax system, to be completed in 2013, affects the development of pensions and the pension fund through net incomes. As pensions are calculated on the basis of net wages, tax cuts impose an additional burden on the state pension fund and thus on the whole of the budget. Their calculations suggest that in the first year the changes will deteriorate the balance of the pension fund by 0.2 per cent of the GDP, and this loss is expected to accelerate in proportion to the growth rate of real wages.

Some of the papers which examine the tax reform commenced in 2011 (for instance, Benczúr et al., 2011a; Benedek and Kiss, 2011; Cseres–Gergely and Simonovits, 2011) also touch upon the tax reform's impact on income distribution, and the assertions made in that relation tend to be relatively consistent. But because none of the researches actually focus on the issue (and thus only a limited section of the papers is devoted to describing their

findings), it seems appropriate and desirable to thoroughly look into the matter, particularly as today we know all the details of the tax reform, implemented over a period of several years and completed in 2013, for certain.

METHODOLOGY

In the assessment of the tax reform we have applied a microsimulation method for our analysis, as this procedure allows for the effects of one or several economic policy measures to be examined at the level of basic units of the economy (individual, household or company). In the case of the tax simulation underlying our research it means that from a database composed of personal income tax returns, we calculate tax liabilities for each taxpayer individually and under different scenarios using a database management application and the available information. We can then aggregate or group the data calculated accordingly for the intended purposes of the analysis. The advantages of this methodology include the possibility to take the distribution of certain economic variables into account, which in turn enables the calculation of non-linear change of rules, while we can also model the interaction of different rules as well as the behaviour of taxpayers (Benedek and Kiss, 2011). As microsimulation allows for the examination of the combined effect of one or several measures from the aspects of different social groups, the method is a crucial instrument of economic policy impact studies.¹²

The widespread dissemination of the microsimulation method took place in three major waves in Hungary. The first one dates back to the mid eighties when the Central Statistical Office and later the Economic Research Institute used this procedure mainly for improving the quality of data collection, for preparing forecasts and at times for con-

ducting impact studies. It was a significant breakthrough when the Ministry of Finance and TÁRKI concluded a cooperation agreement in 2004. The primary purpose of the researches conducted in the above mentioned institutes was to examine the redistribution effect of the tax and subsidy system, usually by linking the personal income tax database to the Household Budget Survey which was designed to document the budgeting of individual families (Benedek and Lelkes, 2006). Subsequently, several publications were produced both within the ECOSTAT (Cserháti et al., 2007, 2009, 2012; Cserháti and Takács, 2010; Belyó et al., 2009) and within the Fiscal Council (Benedek and Kiss, 2011) which relied on this method. The examinations listed in the foregoing were generally static analyses which took neither individuals' reactions, nor the consequent spillover macroeconomic effects into account. From this aspect, the research of Benczúr et al. (2011a) was a major step forward, as they also used new empirical analyses (Kiss and Mosberger, 2011; Benczúr et al., 2011b), increasingly trying to take the above mentioned effects into consideration.¹³

In terms of its methodology, our research belongs to the second wave, also because it disregards several other (labour market, demographic) consequences of the tax reform. Our examination is based on personal income tax returns from 2011¹⁴, which is a novel feature compared to previous researches from two aspects. Firstly, because we do not work with a sample but with the entire population, and as a result our database, after having applied the appropriate filters, is composed of the anonymised personal income tax returns of all 4,372,042 private individuals who had taxable income in 2011. Secondly, former tax returns did not state how many dependent children were raised by the taxpayers, since only those with three or more children were eligible to a tax relief.¹⁵ Thus, for the calcula-

tion of the effects of the expanded family allowance, this datum had to be estimated from other databases with significant uncertainty. The 2011 database, however, already included the number of dependent children, which substantially reduces the uncertainty about the accuracy of the impact study.

It must be noted, however, that from several aspects our examination may be classified as a static analysis. On the one hand, we disregarded behavioural effects. On the other hand, we did not index the database, in other words, the scenarios based on the different legal framework of the particular years (2010, 2011, 2012, 2013) were all examined on the same 2011 database without adjusting either the parameters of the individual taxpayers (e.g.: income), or the whole of the population (with new entrants into or those exiting the labour market) using a variety of estimation methods. We did not abandon the latter because of technical or methodological constraints but because our objective was to describe the direct effects of tax changes independently of the demographic, labour market or other processes.

To that end, in performing the simulations, we took account of the different taxation rules in force in 2010, 2011, 2012 and 2013, in particular of the change of tax rates (also for incomes which are taxed separately), of the abolition and phasing out of tax credits and super grossing in two stages, and of the significant expansion of the family tax allowance.

FINDINGS

The impact of the tax reform on the spreading of the tax burden

According to the findings of our simulations, the tax changes adopted between 2010 and 2013 resulted in a tax reduction of HUF 444 billion. Since each of the measures had very different

impact on the different social groups, it is worth examining these changes along a variety of dimensions. In order to ensure that we can analyse the results of our calculations as a function of the income, we have created income deciles on the basis of taxable gross¹⁶ incomes. As a great proportion of taxpayers who completed the tax return did not have income every month, dividing the annual data by 12 does not automatically produce monthly incomes. In general, we can say that individuals in the first three income groups did not have full time employment throughout the whole year¹⁷, those in the fourth decile earned a minimum wage for 12 months, and taxpayers earning an average wage were in the eighth decile. It should be noted that in the top income decile the average value does not necessarily provide a precise picture of the taxpayers in the group, as the distribution is fairly asymmetric due to the outstandingly high income of some of the members. (The same applies to the results of the simulations as well.)

As a result of the changes, the tax burden on the bottom seven income deciles increased by a total of HUF 134 billion. The tax of the eighth decile dropped slightly, that of the ninth decile decreased by HUF 72 billion, while the tax of those with the highest incomes shrank by HUF 501 billion (see Table 1). As a result of the processes mentioned, the contribution of the tenth decile (with the highest income) to the total tax revenues dropped from 61 per cent to 42 per cent. This proportion did not change markedly in the ninth decile, while that of taxpayers with lower incomes increased substantially.

In terms of individual taxpayers this means that the annual taxes payable by private persons earning an income of around the minimum wage grew from HUF 58,000 to HUF 126,000 on average, while the tax liabilities of taxpayers earning an average income decreased from HUF 312,000 to HUF 299,000.

As the change of the tax burden on individuals with taxable income was influenced by

Table 1

THE IMPACT OF TAX CHANGES ON THE TAX LIABILITIES OF INCOME DECILES

Deciles	Income bracket (HUF thousand)		Average annual tax (HUF thousand)		Ratio of total taxes		Total tax change (HUF billion)
	Minimum	Maximum	2010	2013	2010	2013	
1	–	212.2	6.2	16.0	0.2	0.6	4.3
2	212.2	523.4	16.6	54.9	0.4	2.0	16.8
3	523.4	858.6	27.2	94.5	0.7	3.5	29.5
4	858.6	1,103.2	58.0	125.9	1.5	4.6	29.7
5	1,103.2	1,276.1	92.0	149.8	2.5	5.5	25.3
6	1,276.1	1,596.0	135.0	182.3	3.6	6.7	20.7
7	1,596.0	1,980.5	211.2	229.8	5.6	8.4	8.1
8	1,980.5	2,609.5	311.8	298.2	8.3	10.9	–5.9
9	2,609.5	3,880.3	593.1	429.5	15.8	15.7	–71.6
10	3,880.3	–	2,302.2	1,157.8	61.3	42.3	–500.7
Together			375.3	273.9	100.0	100.0	–443.8

Source: own calculations

other factors apart from the size of the income (number of dependent children, spouse's income, type of income), therefore, when it comes to the consequences, individuals in the same income decile do not form a cohesive cluster either. For that reason, further examinations require the division of taxpayers into three groups: winners are those whose annual tax in 2013 is at least one thousand forints lower than in 2010. The group of losers include individuals whose tax in 2013 is at least 1000 forints higher than in 2010. Individuals whose tax changed into neither direction by more than 1000 forints are classified into the group of unaffected persons. (See Chart 1)

Figure 1 Percentage of Winners, Losers, and Unaffected Persons in the Income Deciles

In the lower four income deciles, the number of winners is around 20 per cent, and this ratio increases by as little as 15 percentage

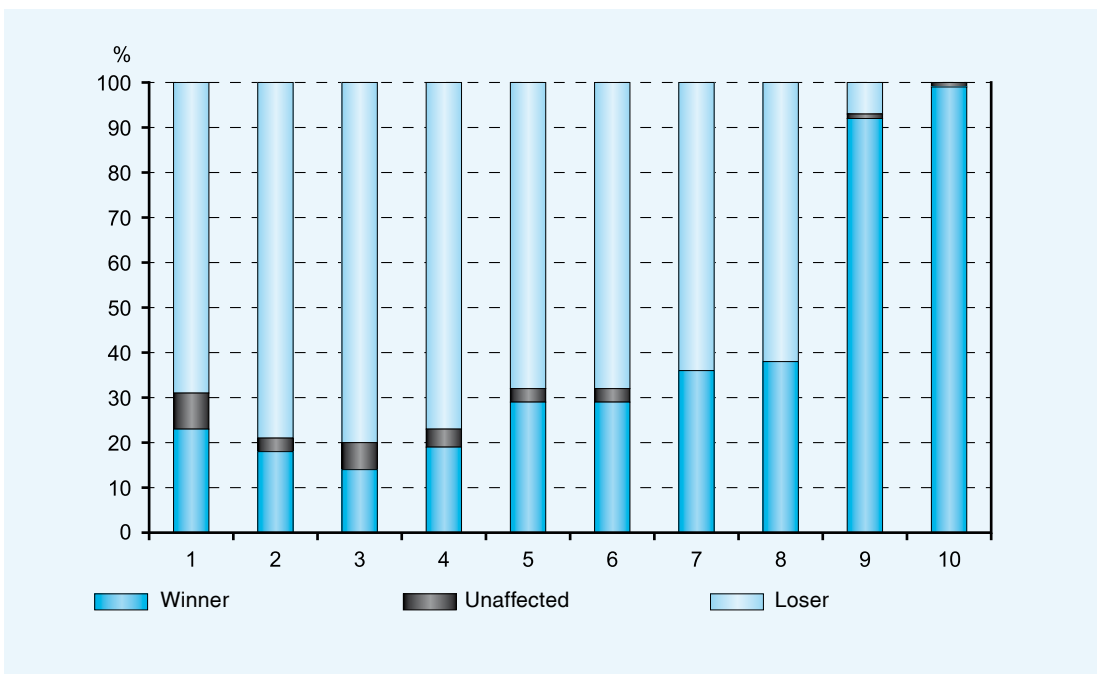
points in the next four income deciles as well. A substantial shift is only apparent in the two highest income deciles: the proportion of winners in the ninth decile is 92 per cent, while in the highest income group it is 99 per cent.

By jointly looking at all private individuals who filed a tax return and had taxable income, we have found the number of winners to be 1.7 million with an annual tax decrease of HUF 364,000 on average, and the number of losers to be 2.5 million with an annual tax increase of HUF 75,000 on average. For 132,000 individuals, the change of the tax was less than HUF 1,000.

As the tax reform changed the tax liabilities of citizens mainly in relation to their income and the number of their children, the examination should focus on the consequences triggered by the transformation of the personal income tax system along these two dimensions

Chart 1

PERCENTAGE OF WINNERS, LOSERS, AND UNAFFECTED PERSONS IN THE INCOME DECILES



Source: own calculations

jointly. Since the tax change for persons with one dependent child or for two dependent children does not differ markedly, for the sake of simplification and for better clarity, they will be jointly treated hereinafter, and three categories are formed accordingly: childless persons (1), persons with one or two dependent children (2) and persons with three or more dependent children (3).

Whereas 77 per cent of those who filed a tax return are childless (or did not claim a family tax allowance granted after children), the change in the tax burden on the latter does not differ significantly from that of the whole population (see Table 2). In all of the lower eight income deciles, the ratio of losers is at least 70 per cent, while the opposite is true for those with the highest income. When expressed in forints this means that the total tax increase of HUF 171 billion translates into an additional tax of HUF 62,000 on average and annually for those in the lower eight deciles. In contrast, the tax of childless

persons belonging to the two highest income deciles has decreased by HUF 330 billion, which suggests that 74 per cent of the total budget cost of the tax reform increases the net income of childless people in the two highest income deciles.

As regards persons with one or two dependent children in the lower four income deciles, the proportion of those unaffected by or losing from the change is close to fifty per cent altogether, despite the adoption of the family tax allowance (see Table 3).

This can be explained by the fact that in Hungary neither the family tax allowance, nor the reduction of the tax rate, nor the elimination of the super grossing could compensate for the phasing out of tax credits. By contrast, almost all individuals in the highest income decile are winners. As a result of the processes described above, 85 per cent of the persons with one or two dependent children were required to pay a lower tax, and only 4 per cent had to pay an increased amount. Tax cuts

Table 2

THE IMPACT OF THE TAX CHANGE ON CHILDLESS PRIVATE PERSONS

Deciles	Winner %	Loser %	Unaffected %	Total persons	Total tax change HUF billion	Average annual tax change HUF
1	23	70	7	426,756	4.3	10,172
2	16	84	1	407,741	17.1	42,009
3	10	89	0	371,077	30.1	81,159
4	12	88	0	331,125	31.8	95,908
5	11	89	0	317,962	29.6	93,083
6	7	93	0	312,130	26.9	86,040
7	9	91	0	303,699	19.6	64,418
8	9	90	0	297,801	11.3	38,083
9	89	9	2	302,341	-32.3	-106,903
10	98	0	2	292,060	-297.4	-1,018,324
Together	27	72	1	3,362,692	-159.0	-47,293

Source: own calculations

Table 3

THE IMPACT OF THE TAX CHANGE ON PERSONS WITH ONE OR TWO DEPENDENT CHILDREN						
Deciles	Winner %	Loser %	Unaffected %	Total persons	Total tax change HUF billion	Average annual tax change HUF
1	50	17	34	8,205	0.0	-6,079
2	55	13	32	23,971	-0.4	-16,894
3	42	29	29	55,299	-0.7	-12,922
4	43	51	6	91,518	-2.0	-21,520
5	85	12	2	103,712	-4.0	-38,915
6	94	6	0	108,166	-5.8	-53,703
7	97	3	0	114,854	-9.9	-86,456
8	99	1	0	119,517	-13.8	-115,089
9	100	0	0	115,489	-30.5	-264,454
10	100	0	0	121,235	-151.0	-1,245,212
Together	85	11	4	861,966	-218.2	-253,111

Source: own calculations

granted for all of the taxpayers with one or two dependent children represent a revenue loss of HUF 218 billion in the budget, 83 per cent of which amount increases the net income of those in the two highest income deciles.

In the case of three or more dependent children, the distribution is substantially different from the earlier patterns. In comparison to persons with one or two dependent children, there are much fewer winners in the lower income deciles (maximum 22 per cent) and the number of those whose tax liability remained the same is much higher. This may be traced back to the fact that taxpayers with three or more dependent children were eligible for a smaller family tax allowance already before the implementation of the tax reform.¹⁸ As a result, some of the families with low incomes were not required to pay taxes in 2010, either. This implies that despite a radical increase of the tax relief granted after children (completed with other changes), these modifi-

cations were not reducing their tax burden (further), since there is no negative tax in Hungary and consequently their net income did not increase. (See Table 4)

All the above factors leave their mark on the aggregate effects as well. While the tax reform offered a total of HUF 67 billion of tax reduction for persons with three or more dependent children, 92 per cent of this amount increased the net income of taxpayers in the top two income deciles, and the tax of large families in the lower six income deciles did not change markedly. This explains that while the tax of 63 per cent of all large families decreased, it was substantially unchanged for 33 per cent and 4 per cent was required to pay a higher tax.

Decomposing the tax reform

The tax changes adopted in the period between 2010 and 2013 may be divided into four separate measures: the expansion

Table 4

THE IMPACT OF THE TAX CHANGE ON PERSONS WITH THREE OR MORE DEPENDENT CHILDREN

Deciles	Winner %	Loser %	Unaffected %	Total persons	Total tax change HUF billion	Average annual tax change HUF
1	2	20	78	2,543	0.0	3,597
2	1	15	84	5,793	0.0	5,930
3	9	11	79	11,127	0.1	5,503
4	19	8	73	14,862	-0.1	-6,101
5	22	7	70	15,830	-0.3	-15,904
6	35	6	59	17,227	-0.4	-20,357
7	92	2	6	18,933	-1.5	-78,861
8	98	1	1	20,186	-3.5	-174,945
9	99	0	1	19,674	-8.7	-441,682
10	100	0	0	24,209	-52.3	-2,159,977
Together	63	4	33	150,384	-66.6	-442,823

Source: own calculations

of the family tax allowance; the adoption of the flat tax rate (for merged and separately taxed incomes); the phasing out of the super grossing system; the abolition of tax credits. As some of these measures have been implemented in several steps, and the effects of the particular measures may be combined in the examination of annual changes, therefore in the interest of decomposing the aggregate effects it seems most appropriate to classify the consequences along the above mentioned measures and not on annual bases. In the first step, we will describe what changes these measures would have induced separately in comparison to the taxation practices in 2010, in other words, if they had been implemented in 2010, leaving all other effective tax rules unchanged. It must be emphasised that the sum of the individually measured effects does not correspond to the *aggregate* impact of the changes adopted between 2010 and 2013, since the presence of any one measure may influence the effect of another measure, and

vice versa. Having said that, a decomposition thus completed can still highlight the separate directions in which these four measures transform taxation practices.

The expansion of the family tax allowance means a tax cut of nearly HUF 173 billion, 59 per cent of which is a tax reduction for the two deciles with the highest incomes. (*see Table 5*).

The adoption of a flat tax rate, i.e. the abolition of the upper tax rate, and the reduction of the lower tax rate, together with the expansion of the latter to separately taxed incomes, would have meant a loss of tax revenues of HUF 408 billion in itself. Since the most important one of these steps is the abolition of the upper tax rate which only affected the decile with the highest income, and they are the same taxpayers who have higher than average separately taxed income, it explains why 83 per cent of the tax cut actually increases their net income. The same applies to the termination of the super grossing system, which

Table 5

THE TAX PAYMENT EFFECTS OF THE PARTICULAR MEASURES BY INCOME DECILES

(HUF billion)

Deciles	Expansion of the family tax allowance		Introduction of a single (flat) tax rate		Abolition of super grossing		Phasing out of the tax credit	
	Total change	Average change (%)	Total change	Average change (%)	Total change	Average change (%)	Total change	Average change (%)
1	-0.1	-3	-0.5	-17	-0.5	-19	6.9	253
2	-0.5	-7	-1.1	-15	-2.0	-28	26.9	369
3	-1.4	-12	-1.9	-16	-4.2	-36	51.5	433
4	-4.8	-19	-5.5	-22	-13.9	-55	64.7	255
5	-9.0	-22	-6.7	-17	-22.4	-56	68.2	170
6	-13.2	-22	-8.4	-14	-27.2	-46	72.6	123
7	-18.8	-20	-10.8	-12	-35.0	-38	72.1	78
8	-23.8	-17	-14.1	-10	-45.5	-33	72.8	53
9	-28.8	-11	-21.0	-8	-90.5	-35	31.8	12
10	-72.9	-7	-338.0	-34	-243.1	-24	0.0	0
Together	-173.4	-11	-407.9	-25	-484.5	-30	467.6	28

Source: own calculations

would, by nature, offer everyone a tax reduction which would be different in its amount, but identical in its proportion. Nevertheless, due to tax credits, not yet phased out in 2010, and an upper tax rate applicable to those with the highest incomes, the average tax reduction is significantly different in the particular income deciles.

The only measure which would have in itself increased tax revenues was the abolition of the tax credit. By way of derogation from the original purposes, in 2010 the tax credit was not only eligible to those with the lowest income levels, but it was a tax reduction option available to everyone, with the exception of the highest-income taxpayers; consequently, the impact of the HUF 468 billion of tax rise arising from the abolition of the option also spreads over the bottom nine income deciles.

The decomposition of changes also reveals that the lowering of tax burdens linked to bringing up children is proportionally less than one fifth of the income-related tax cuts, while in terms of its impact, the only revenue boosting measure (tax credit) may also be classified among the latter ones.

Impact of the potential adoption of a single digit income tax rate

Using the previously described method, we have also examined how the adoption of a 9 per cent flat tax rate would affect budget revenues and tax burdens. It must be noted, however, that similarly to our other analyses, this option, as well as the 2013 legal framework we used as a benchmark, was simulated on the 2011 database.

Table 6

THE IMPACT OF THE ADOPTION OF A 9 PER CENT TAX RATE

Deciles	Total taxes (HUF billion)			Average annual tax (HUF thousand)		
	16%	9%	Change	16%	9%	Change
1	7.0	4.0	-3.0	16.0	9.2	-6.8
2	24.0	13.6	-10.5	54.9	31.0	-23.9
3	41.4	23.2	-18.1	94.5	53.1	-41.5
4	55.1	30.9	-24.1	125.9	70.7	-55.1
5	65.6	36.9	-28.7	149.8	84.2	-65.6
6	79.8	44.8	-35.0	182.3	102.3	-80.0
7	100.5	56.5	-44.1	229.8	129.0	-100.7
8	130.5	73.2	-57.2	298.2	167.4	-130.8
9	187.9	105.6	-82.3	429.5	241.4	-188.1
10	506.5	287.7	-218.8	1157.8	657.6	-500.2
Together	1,198.2	676.4	-521.8	273.9	154.6	-119.3

Source: own calculations

Based on the 2011 data, it appears that the replacement of the 16 per cent tax rate with a 9 per cent tax rate would reduce total budget revenues from personal income tax by HUF 521.8 billion, that is by 44 per cent. Given the nature of the change, the tax reduction is spread among private persons in different income deciles in accordance with the extent to which the particular deciles contribute to the total of tax revenues. Accordingly, 42 per cent of the overall tax reduction, i.e. HUF 219 billion will increase the net income of those in the top income decile. (See Table 6).

If such a scenario happens, the net wage of taxable private persons would increase by an annual HUF 119,000 on average, which is a monthly tax reduction of HUF 9,900, assuming 12 months of employment. In the bottom five income deciles the adoption of a single digit income tax would entail an annual tax decrease of HUF 39,000 on average, while those with higher incomes would on average earn HUF 200,000 higher net wages.

A smaller tax, however, also mitigates the significance of the family tax allowance. Based on the 2011 data it seems that while in 2013 the family tax allowance reduces the tax of those with dependent children by HUF 195 billion, the adoption of a 9 per cent tax rate would decrease that amount to HUF 110 billion.

SUMMARY

The flat tax reform implemented between 2010 and 2013 triggered a significant change in the tax burdens of certain social groups and their contribution to total tax revenues. For a total of 2.5 million taxpayers, their annual tax increased by HUF 75,000 on average, while 1.7 million people had to pay HUF 364,000 less tax annually. The tax change was less than HUF 1,000 for 132,000 people. From the aspect of the tax change, the key factor was the size of the income, followed by the num-

ber of dependent children. The contribution of the top income decile to total tax revenues shrank from 61 per cent to 42 per cent. 74 per cent of the tax reduction of HUF 444 billion achieved as a result of the tax reform increased the net income of childless taxpayers in the top two income deciles. 85 per cent of the taxpayers with one or two dependent children had to pay at least HUF 1,000 less tax on an annual basis, while for persons with three or more children, this ratio is only 63 per cent. This latter may be explained by the

fact that these taxpayers were eligible for a smaller family tax allowance even before: as many of them were not required to pay any tax before the reform, the average tax liability of persons with dependent children did not decrease markedly in the bottom six income deciles. Reducing the tax rate to 9 per cent would result in a further 44 per cent decrease of budget revenues from personal income tax, which – on the basis of the 2011 data – would mean a loss of an additional HUF 522 billion of tax revenues on an annual basis.

NOTES

- ¹ For more details, see the study of Carone et al. (2007).
- ² It must be emphasised that flat tax systems may indeed vary greatly. In the following, the systems we consider flat tax systems are those where the income of private individuals is taxed at a single tax rate, irrespectively of any tax benefit or relieves and whether or not the same tax rate is applied to other tax types as well.
- ³ Scharle et al. (2010) came to similar conclusions from the examination of the efficiency of tax systems. They suggested that a simple and more transparent tax system improves taxation morale while the reform (demonstrating the government's strength) may enhance the country's ability to attract capital.
- ⁴ The lower than expected increase of tax revenues may be traced back to two possible reasons. First, tax evasion was only reduced in countries where the tax rate of the personal income tax was the same as that of the corporate income tax. Second, the employment impact of the reduction of the tax on labour was also lower than expected. This is elaborated in more detail in the study of Gray et al. (2007).
- ⁵ The social costs and efficiency of tax systems and different taxes are described at length in the paper of Bakos et al. (2008b).
- ⁶ Source: <http://uk.reuters.com/article/2012/05/25/uk-romania-politics-idUKBRE84O0JE20120525> (Downloaded on: 05.07.2013)
- ⁷ Source: http://www.gov.ro/pm-victor-ponta-2013-is-the-year-in-which-not-only-through-budget-and-fiscal-measures-but-through-a-joint-effort-as-well-can-we-consolidate-the__12a119428.html (Downloaded on: 05.07.2013)
- ⁸ The study of Kiss and Mosberger (2011) examined the taxation elasticity of higher income Hungarian taxpayers and came to a similar conclusion: the estimated elasticity was 0.2.
- ⁹ The hypothetical tax system has the following characteristics: The tax rate on incomes in excess of the statutory minimum wage of 2005 is 30.3 per cent, with a 13.5 per cent social security contribution. Tax allowances and deductions are eliminated. Bakos et al. (2008a) selected the single tax rate to devise a system which would be neutral in terms of budget revenues, excluding the behavioural reaction, although the single tax rate

(30.3+13.5 per cent) they thus adopted is relatively high in comparison too ther flat taxrates in the Central and Eastern European region.

¹⁰ The adoption of a flat tax system, there duction of tax credit, the expansion of family tax allowance, the 0.5 per cent increase of the employee contribution.

¹¹ According to the calculations of Erdős (2012), the income multiplier of an economy with high demands for import, like Hungary, is significantly lower than that of an economy which relies on its internal market.

¹² For more details on the microsimulation method, see the paper of Benedek – Lelkes (2005)

¹³ Among other things, the study of Benedek et al.

(2012) examined the long term macroeconomic effects of key economic policy measures.

¹⁴ The income tax deducted by paying agents and not state don the tax returns is disregarded through out the whole examination due to the special regulation the tax is subject to. Revenues from this source account for approximately 15 per cent of all personal income tax revenues.

¹⁵ Under a certain income threshold.

¹⁶ Not super gross.

¹⁷ As their annual income does not reach 12 times the statutory minimum wage prevailing in 2011.

¹⁸ HUF 4,000 each month and fo reach dependent up to an income limit.

LITERATURE

BAKOS, P. – BENCZÚR, P. – BENEDEK, D. (2008a): Az adóköteles jövedelem rugalmassága (The Elasticity of Taxable Income). *Közgazdasági Szemle(Economic Review)*. Volume LV, September 2008, pp. 733–762.

BAKOS, P. – BÍRÓ, A. – ELEK, P. – SCHARLE, Á. (2008b): A magyar adórendszer hatékonysága (The Efficiency of the Hungarian Tax System). *Közpénzügyi füzetek* 21. April, 2008.

BENCZÚR, P. – KÁTAY, G. – KISS, Á. – REIZER, B. – SZOBOSZLAI, M. (2011a): Az adó- és transzferrendszer változásaink elemzése viselkedési mikroszimulációs modell segítségével (Analysis of Changes in the Tax and Transfer System with a Behavioural Microsimulation Model). *MNB Bulletin*. October, 2011.

BENCZÚR, P. – KÁTAY, G. – KISS, Á. – RÁCZ, O. (2011b): Income, Taxation, Transfers and Labour

Supply at the Extensive Margin. Manuscript, MNB

BELYÓ, P. (ed.) (2009): Adó-szimulátor. Egyes adónemek mikroszimulációja (Tax Simulator. Microsimulation of Certain Taxes). *Időszaki Közlemények*, 37. *Ecostat*. Budapest

BENEDEK, D. – KISS, Á. (2011): Mikroszimulációs elemzés a személyi jövedelemadó módosításainak hatásvizsgálatában (Microsimulation Analysis in Examination of the Effects of Personal Income Tax Changes). *Közgazdasági Szemle (Economic Review)*. Volume LVIII, February, 2011. pp. 97–110.

BENEDEK, D.– KÁTAY, G. – KISS, Á. [2012]: Az adóváltozások hatásainak elemzése mikroszimulációs modellek segítségével (Analysis of Tax Changes Using Microsimulation Models). *Munkaerőpiaci Tükör 2012. (Hungarian Labour Market Yearbook)* Nation-

al Employment Non-Profit Public Company Ltd, Institute of Economics, Centre for Economic and Regional Studies of the Hungarian Academy of Sciences. Budapest, pp. 119–137.

BENEDEK, D. – LELKES, O. (2005): A magyarországi jövedelem újraelosztás vizsgálata mikroszimulációs modellel (Assessment of Income Redistribution in Hungary with a Microsimulation Model). *PM Kutatási Füzetek. Issue 10*

BENEDEK, D. – LELKES, O. (2006): A magyarországi jövedelem-újraelosztás és egy egykulcsos adóreform vizsgálata mikroszimulációs modellel (Assessment of Income Redistribution and a Hypothetical Flat Tax Reform in Hungary with a Microsimulation Model). *Közgazdasági Szemle (Economic Review)*. Volume LIII, July-August, 2006. pp 604–623

CARONE, G. – NICODEME, G. – SCHMIDT, J. H. (2007): Tax Revenues in the European Union: Recent Trends and Challenges Ahead. *European Economy Economic Papers*. No. 280

CSERES-GERGELY, Zs. – SIMONOVITS, A. (2011): A személyi jövedelemadó reformjának hatása a társadalombiztosítási nyugdíjakra (The Impact of the Personal Income Tax Reform on State Pensions). *Közgazdasági Szemle (Economic Review)*. Volume LVIII, December, 2011. pp. 1029–1044

CSERHÁTI, I. – DOBSZAYNÉ, H. J. – HAVASI, É. – KERESZTÉLY, T. – KÖVÁRI, Zs. – SZÉP, K. – TAKÁCS, T. – TALLÉR, A. – TAMÁSI, B. – VARGA, Zs. (2007): A háztartások jövedelemalakulásának elemzése mikroszimulációs modellel (Analysis of Household Incomes with a Microsimulation Model). *A gazdaságelemzés módszerei (Methods of Economic Analysis)*, Issue 2. *Ecostat-KSH*. Budapest

CSERHÁTI, I. – DOBSZAYNÉ, H. J. – TAKÁCS T. (2012): Mikroszimuláció alkalmazása a munkaügyi statisztikában (Microsimulation in Labour Sta-

tistics). *Statisztikai Szemle*, Volume 90. Issue 9, pp 844–861.

CSERHÁTI, I. – PÉTER, I. – VARGA, Zs. (2009): A lakosság jövedelmi rétegződésének tendenciái 2008–2009-ben (Tendencies of Household Income Inequality in 2008–2009). *Fejlesztés és Finanszírozás (Development and Financing)*. Issue 3, pp. 70–78

CSERHÁTI, I. – TAKÁCS, T. (2010): Analysis of Income Inequalities by Microsimulation. *Hungarian Statistical Review*, Special Number 14. pp. 110–124

ERDŐS, T. (2012): Egykulcsos jövedelemadó és gazdasági növekedés. (Flat Rate Income Tax and Economic Growth.) *Economic Review*. Volume LIX. February, 2012. pp. 109–138

GRAY, C – LANE, T. – VAROUDAKIS, A. (2007): Fiscal Policy and Economic Growth: Lessons for Eastern Europe and Central Asia, The World Bank, Washington D.C.

IVANOVA, A. – KEEN, M. – KLEMM, A. (2005): The Russian Flat Tax Reform. *IMF Working Paper*. WP/05/16

KEEN, M. – KIM, Y. – VARSANO, R. (2006): The „Flat Tax(es)”: Principles and Evidence. *IMF Working Paper*. WP/06/218

KISS, Á. – MOSBERGER, P. (2011): The Elasticity of Taxable Income of High Earners: Evidence from Hungary, MNB WP 2011/11

KISS, S. Cs. – SCHARLE, Á. – SZABÓ, B. – SZABÓ, P. A. (2008): Adóreformok Európában (Tax Reforms in Europe). *Külgazdaság*. 2008, Volume 52. Issue 9-10., pp. 7–33

PIRES, A. J. G. – JENSEN, T. S. (2011): Effects of Flat Tax Reforms on Economic Growth in the

OECD Countries. *SNF WorkingPaper No12/11*.
Institute for Research in Economics and Business
Administration

SAAVEDRA, P. (2007): Flat Income Tax Reforms.
In: Gray, C. – Lane, T. – Varoudakis, A. (ed.):
Fiscal Policy and Economic Growth, The World
Bank, pp. 253-280

SCHARLE, Á. – BENCZÚR, P. – KÁTAY, G. – VÁRA-

DI, B. (2010): Hogyan növelhető az adórendszer
hatékonysága? (How to Increase the Efficiency of
the Tax System). *MNB-tanulmányok (MNB Stud-*
ies) 88., September, 2010

TÓTH, G. Cs. (2010): Állami keresletélénkítés
és automatikus stabilizátorok Boosting demand
by the state and automatic stabilizers). *Pénzügyi*
Szemle (Public Finance Quarterly). Volume 55. Is-
sue 1. pp. 51–68