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AKADÉMIAI KIADÓ

The redistributive effect of the Hungarian flat tax and family allowance system

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ABSTRACT

The study examines the income redistribution effects of the Hungarian flat-tax and the recently introduced family allowance scheme. They were done on the basis of people's individual data for 2007, 2011 and 2020, which yields more accurate estimates than the previous studies based on aggregate or survey data. Between 2011 and 2013, progressive taxation was abolished, and a flat income tax was introduced, along with a substantial widening of pre-existing family tax allowances. We find that the tax reform has favoured high-income earners and taxpayers with children, while the main losers were low-income and/or childless workers. While the share of family tax allowances is somewhat lower for the high-income deciles, this effect is in practice negligible, therefore the income tax system can still be considered flat. The family tax allowance scheme favours wealthy families with many children over low-income families with fewer or no children. The biggest winners of the scheme are the taxpayers in the top income decile with three or more children: these 22,000 taxpayers (that is, 2% of all recipients) receive 10% of the total amount of the family tax allowance, and almost a third of the credit allocated to families with three or more children.

KEYWORDS

flat tax reform, income tax, redistribution, family tax allowance, Hungary

JEL CLASSIFICATION INDICES

H24, H23

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1. INTRODUCTION

In a flat (or single-rate) income tax system the tax rate does not depend on the level and source of income, as opposed to progressive tax systems, where higher incomes are taxed at higher percentage rates. Tax policies and the parameters of tax systems have significant economic and social consequences through numerous channels.

A tax system can be called optimal if it achieves the required fiscal revenue and the desired redistribution of income at the lowest possible social cost (that is, administrative costs and distortionary effects). Evidence shows that a classical single-rate tax system may be beneficial in terms of social costs: it reduces the marginal tax rate on higher incomes, hence increasing the labour supply of higher income earners (Adhikari – Alm 2016), reduces tax avoidance (Ivanova et al. 2005) and administrative costs of taxation (Hall – Rabushka 2007). However, a single-rate system might reduce redistribution and thus increases income inequality and, indirectly, wealth inequality (e.g., Barrios et al. 2020). Note, however, that the relationship between flat tax and income redistribution is not unambiguous a priori. As Keen et al. (2006) and Davies – Hoy (2002) showed, if a (relatively high) flat tax is accompanied with a basic tax allowance with a substantial tax-free amount, as suggested by the original Hall-Rabushka proposal, the income tax can remain progressive. In addition, Enami (2018) shows that when a fiscal system creates reranking in individuals, the impact of a flat tax rate compared to a progressive tax schedule is not straightforward. Finally, as Saavedra (2007) points out, the flat tax system might close loopholes that typically favour high earners thus reduce tax avoidance, which counteracts the fall in the marginal tax rates on high earnings.

As of 2022, only a few countries have a flat tax system. Although several post-socialist countries introduced single-rate personal income tax (hereinafter: PIT) in the two decades after the regime change, a classical single-rate system has not been used anywhere in the region and by the end of the 2010s most countries had reverted to multi-rate schemes (Table 1). The effects of these (partial) flat tax reforms on economic growth remained below expectations (although the measurement of these effects is problematic). The few available post-reform empirical evidence suggests that they contributed to inequality, especially in the countries where the flat tax accompanied with no or low basic allowance (see for example, Voineia (2009) for Romania, Hallaert (2020) and Tanchev (2021) for Bulgaria). Simulations suggest that the move toward progressive tax rates would enhance equity in the Central European countries[1] (Barrios et al. 2020). However, a de-facto single-rate system has not actually been introduced anywhere, suggesting that the theoretical concept is difficult to implement in practice. Further, the single-rate systems were mostly introduced along with other measures (such as tightening control mechanisms), which hampers the accurate measurement of the (partial) effect of single-rate taxes (Erdős 2012). Some studies have found that tax morale improved significantly in cases where both capital and labour tax rates had been standardised (e.g., Saavedra 2007) but in Russia, for example, this was mainly caused by the reform of tax administration (Varsano et al. 2006). By contrast, Filer et al. (2019) concluded that the Slovak, Serbian, Russian and Georgian reforms had not provoked significant changes in tax avoidance.[2]

[1]Bulgaria, Estonia, Latvia, Lithuania, Hungary and Romania.

[2]Compared to the performance of the similar tax systems in the Czech Republic, Croatia, Ukraine and Armenia.

Table 1. Single rate PIT systems in Central and Eastern European countries

	Year of introduction	PIT rate	Introduction of additional PIT rate(s)	New VAT rates	Tax credits/ discounts?
Estonia	1994	26	–	20	Yes
Lithuania	1994	33	2019	20 & 32	Yes
Latvia	1997	25	2018	20, 23 & 31,4%	Yes
Slovakia	2004	19	2013	19 & 25	Yes
Romania	2005	16	–	10	No
Czech Republic	2008	15	2021	15 & 23	Yes
Bulgaria	2008	10	–	–	No
Hungary	2011	16	–	15	No

Note: PIT = personal income tax. VAT = value added tax. Tax credits refer to the reduction of the tax base under certain conditions.
Source: OECD Taxing Wages (2020).

Our paper focuses on one of the various potential effects of flat-tax reforms: its effect on redistribution of taxable income. We emphasise that whilst the income redistributive effect of the income tax system is an important driver of income inequalities (especially in the absence of large-scale welfare reforms), we do not draw conclusions about changes in overall income inequality in Hungary. The reason for this is that we do not examine other factors determining inequality, for example change in tax evasion and avoidance, or adjustment in gross wages. It is important to note that the transfer system has also moved towards greater inequality, as the reforms that started in 2011 have significantly reduced subsidies for low-income groups. The empirical focus of the study is Hungary, where (as in other countries) the tax system has not become completely flat, but the progressivity of taxation has been reduced significantly. The focal measures of the Hungarian tax reform include the introduction of a single rate PIT between 2011 and 2013, the abolition of basic allowance and the significant extension of family tax allowances in several steps from 2011.

Several studies have examined different effects of the Hungarian tax reform. Based on a micro-simulation forecasting model, Benczúr et al. (2011) contended that in the long-run, the flat tax reform could increase GDP by more than 5% and slightly increase the labour supply, but the aggregate employment effect could be negative due to the elimination of the minimum wage tax credit (in Hungarian "adójóváírás"). However, *ex-ante* evaluations of potential reforms (carried out before the actual reform) concluded that it would increase inequality (Benedek – Lelkes 2006; Bakos et al. 2008).

Other studies have also assessed the actual redistributive effects of the new system. Based on a static microsimulation model using PIT data from 2011, Tóth G. and Virovácz (2013) concluded that the reform had increased the tax burden of most taxpayers (mostly at the lower

end of the income distribution): 2.5 million taxpayers paid on average HUF 75,000 (EUR 270)[3] more tax per year, 1.7 million people had their tax burden reduced by HUF 364,000 (EUR 1300) on average, while 132,000 taxpayers were not affected significantly by the reform. The change in the tax burden largely depended on the level of income and the number of children. The contribution of the top decile to total tax revenue fell from 61% to 42%. Three quarters of the total tax cut of HUF 444 billion (EUR 1.59 billion) increased the net income of taxpayers without children in the top two deciles, and the vast majority of those with children also benefited from the new scheme. Benczúr et al. (2018) also contended that the reform had increased income inequality, decreased incentives for low-earners, and consequently their employment level. By contrast, the reform has increased high-earner's incentives and pre-tax income (Benczúr et al. 2018; Kiss – Mosberger 2015).

This study analyses the impact of the reform on income distribution in the post-2013 period, which has not been analysed based on administrative data (that is, individual records collected by governmental bodies for different non-statistical purposes, for example, taxation and managing public services).[4] Our research complements the extant empirical literature in three respects. First, several elements of the tax system changed after 2013. The most important among these was the extension of the family tax allowance (in Hungarian "családi adókedvezmény") to lower-income earners. Second, the administrative data for 2020 provides a more accurate picture of the distribution of the family tax allowance after the abolition of the minimum wage tax credit scheme than, for example, the data from 2011 used by Tóth G. – Virovácz (2013). In 2011, as the minimum wage tax credit system was still in force, many of the eligible taxpayers at the lower income levels did not claim the family tax allowance, as the minimum wage tax credit reduced their tax base to zero even without the family tax allowance. To this moment, the effect of family allowances on income distribution and the distribution of family allowances across diverse recipient groups have not been analysed.

Third, administrative data allows for a more rigorous estimation of the income of taxpayers in the bottom and top deciles of the income distribution than population surveys, thus providing a more accurate picture of the distribution of the tax burden and the overall loss in the budgetary revenues. The limitations of the analyses based on administrative data are discussed in the next section. Our findings may contribute to the literature on the effects of single-rate tax systems. Although the existence of a negative association between progressivity and redistribution is evident, the precise extent of this negative association remains of interest and is investigated by many studies (Barrios et al. 2020).

The study is structured as follows. Following the introduction (Section 1), we present the main parameters and changes in the Hungarian income tax system over the past decade (Section 2) and compare it with other countries' tax systems (Section 3). Then we present the data and the methods applied (Section 4), and the main results of the analysis (Section 5). Finally, we summarise the main findings of the study (Section 6).

[3]Amounts are converted based on the average exchange rate in the given year.

[4]Analysing the distribution of pre-tax income using data from PIT declarations, Svraka (2021) found that between 2009 and 2019, inequality decreased slightly for gross wage income and increased slightly for total income including taxable income separately, but the paper does not investigate the post-tax income distribution.

2. THE HUNGARIAN INCOME TAX SYSTEM BETWEEN 2007 AND 2021

Until 2010, Hungary had a progressive, multi-rate PIT scheme. Between 2011 and 2013, the tax system was substantially altered. In 2011, a 16% single-rate PIT was introduced (which was reduced to 15% in 2015), but due to the progressive tax base credit that was in place until 2011, and the progressive tax base supplement ("super gross")[5] that was also in force between 2010 and 2012, it has effectively become single-rate only from 2013.

Before the 2011 reform, tax allowances for children were relatively modest: until 2010, the family tax relief was only available for parents with three or more children, and its amount was HUF 4,000 (EUR 14) per child per month, which could be deducted from personal income tax up to an annual income limit of HUF 6 million (EUR 21,000). In 2011, the net value of the minimum wage tax credit increased significantly and became a tax base allowance ("családi adóalap kedvezmény"). The most important changes in the family tax allowance rules between 2011 and 2021 include:

- Since 2014, the family tax allowance can also be deduced from employees' contributions.
- From 2016 to 2018, the social benefit for families with two children was gradually doubled (from HUF 10,000 net to HUF 20,000) per child (that is, from EUR 35–70).
- Since 2020, mothers with four or more children are exempted from PIT.

The rate of the family tax base allowance for one and three children has not kept pace with inflation and wage increases, so its relative weight has decreased. Note that we use the umbrella term "family allowances" hereinafter to refer to the sum of the family tax base allowance, the family contribution allowance, and the PIT exemption for mothers of four or more children.

Table 2 presents the most important rules on income tax rates, minimum wage tax credits and tax allowances in five selected years.

The rate of employees' social security contributions has not changed significantly: the sum of all employees' contributions has risen from 17% to 18.5%.[6] Further, the abolition of the pension contribution cap in 2013 slightly increased the overall tax burden on high-income earners.[7] In addition, employers' contributions – which do not affect the difference between gross and net wages directly but do influence labour costs and nominal wages in the longer term – have decreased significantly from 27% in 2011 to 15.5% in 2021. The change in the overall tax rate – depending on the income level and the number of children – is presented in detail in the online Supplemental material 1.[8]

[5]Between 2010 and 2012, employer's contributions were added to the tax base ("super gross"), which implied higher effective PIT rates.

[6]The pension contribution rate was increased from 8.5% to 10% in several steps from 2007 to 2021, and the ceiling was abolished in 2013. The health insurance contribution rate was 7% until 2007, 6% until 2011, then 7% again. The labour market contribution was 1.5% throughout the period under review. As of 1 July 2020, the three types of employees' contributions were replaced by a combined "social security contribution" of 18.5%.

[7]The cap on pension contributions in 2010 was HUF 7.9 million (EUR 28700). Revenues above this amount were not subject to pension contributions.

[8]Online supplemental material to this article is available at https://www.researchgate.net/publication/368292708_The_redistributive_effect_of_the_Hungarian_flat_tax_and_family_allowance_system-Online_.

Table 2. Main rules of the Hungarian income tax system 2007–2021 (employee side)

Tax	2007	2011	2013	2017	2021
PIT					
Band limit (EUR, annual)	6,800	–	–	–	–
Lower tax rate, %	18.0	20.3*	16.0	15.0	15.0
Top tax rate(s), %	36.0; 40.0**	–	–	–	–
Minimum wage tax credits					
Lower threshold (EUR, annual)	8,400	9,857	–	–	–
Max value (EUR, monthly)	45	43	–	–	–
Phase-out threshold (EUR, annual)	11,040	14,194	–	–	–
Family tax allowance (EUR, monthly)					
One dependent - tax base	–	224	208	202	180
One dependent - net		36	33	32	27
Two dependants - tax base	–	224	208	323	360
Two dependants - net/dependent		36	33	48	54
Three dependants - tax base	–	738	687	665	595
Three dependants, net/dependent	14	118	110	106	89
Can also be deducted from employee ssc contributions	X	X	X	✓	✓
PIT exemption for mothers of four or more children	X	X	X	X	✓
Employees' contributions (%)					
Social security contributions	–	–	–	–	18.5
Pension contributions	8.5	10	10	10	–
Health insurance contribution	7	6	7	7	–
Labour market contribution	1.5	1.5	1.5	1.5	–
Total	17.0	17.5	18.5	18.5	18.5

Note: PIT = personal income tax. Band limit refers to the amount of income under which the lower PIT is applicable. Lower tax rate refers to the minimum income tax rate while Top tax rate refers to the higher marginal income tax rates. The family tax allowance is a reduction of the income tax basis for families with children; the amount of the reduction depends on the number of dependent children. * Between 2010 and 2012, employer's contributions were added to the tax base ("super gross"), which implied higher effective PIT rates. ** Private persons with a combined annual income of more than EUR 27,000 had to pay a surtax of 4% on their income over this amount.
Source: Relevant legislation.

3. THE HUNGARIAN TAX SYSTEM IN INTERNATIONAL COMPARISON

3.1. The tax burden on childless taxpayers

In 2011, Hungary was the last country in the region to introduce a single-rate PIT system, which by then had been adopted by almost all Central and Eastern European (CEE) countries. It is important to stress, however, that the single-rate systems can differ significantly: they can include credits or allowances that substantially reduce the overall tax burden on low-income earners.

First, taking into account the PIT, as well as employees' and employers' contributions, we examine the overall tax burden on labour income in an international comparison. Figure 1 shows the overall tax burden on labour as a share of the total labour cost, i.e., the 'super gross' including employee and employer contributions (the so-called tax wedge) in 2020. It can be seen that the tax wedges at the income levels corresponding to 50% (about HUF 209,000 or EUR 600 gross in Hungary) and 167% (about HUF 700,000 or EUR 2000 gross) of the average salary for a single, childless taxpayer (the minimum wage in Hungary is about 39% of the average wage).

As Figure 1 shows, Hungary has the highest overall tax burden on low labour incomes among the EU countries. This is primarily because the Hungarian income tax system, in contrast to those of other member states, does not include any credits or allowances that reduce the tax burden vis-á-vis low-income childless taxpayers. Rebates on the employers' contributions for different beneficiary groups have limited effects only.[9]

Hungary is a middle-ranking nation among the EU countries in terms of the overall tax burden on higher incomes (grey dashed line in Figure 1; note, however, that the figure does not show extremely high incomes). The figure also shows that in Hungary, low and high-income earners without children have the exact same tax wedge (i.e., they are taxed at the same rate). As Figure 2 shows, apart from Hungary, only Bulgaria has an effective flat income tax system in the EU. The difference between the tax burdens on lower and higher incomes is 12% on average in the EU27.

3.2. The tax burden on taxpayers with children

Tax allowances and benefits for children together also largely affect the net income of families with children. To examine these effects, first, based on the OECD "Tax-benefit calculator", we analyse how the overall tax burden (including family tax allowances and social benefits) affects families' net income in Hungary compared to other EU countries.

The Hungarian system of family tax and contribution allowances differs from that of other EU countries in the following aspects (see the previous section for the key features of family allowances). The tax allowance for one child is relatively low in comparison with other countries. In effect, the overall tax burden is relatively high. The net income (as a share of the average wage) of a family with one child earning half of the average wage (including social benefits) is the lowest in the EU (see Figure 3). Tax allowances for more than one child are more generous:

[9]The tax wedge for workers aged under 25, over 55 and unskilled workers (taking into account the rebate on employers' social security contributions), is also one of the highest ones in the EU. Employers are entitled to larger rebates for a small fraction of taxpayers only.

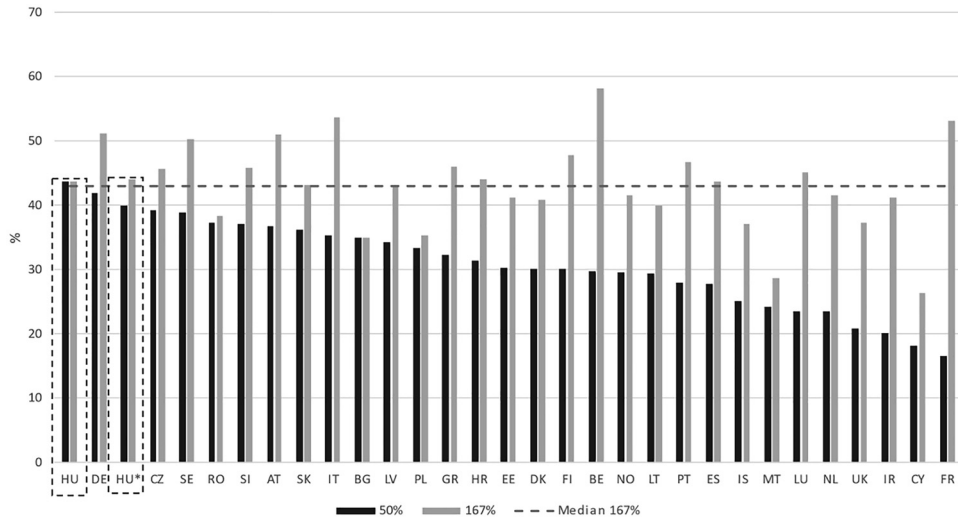

Fig. 1. Tax wedges for single, childless taxpayers earning between 50% and 167% of the average wage (2020)

Note: HU: Tax wedge of Hungarian taxpayers aged under 25, over 55 and without qualifications, for whom employers are entitled to a social contribution rebate.

Source: BI calculation based on the European Commission's "Tax and benefits indicators database". Countries in the CEE region are signalled with darker shades.

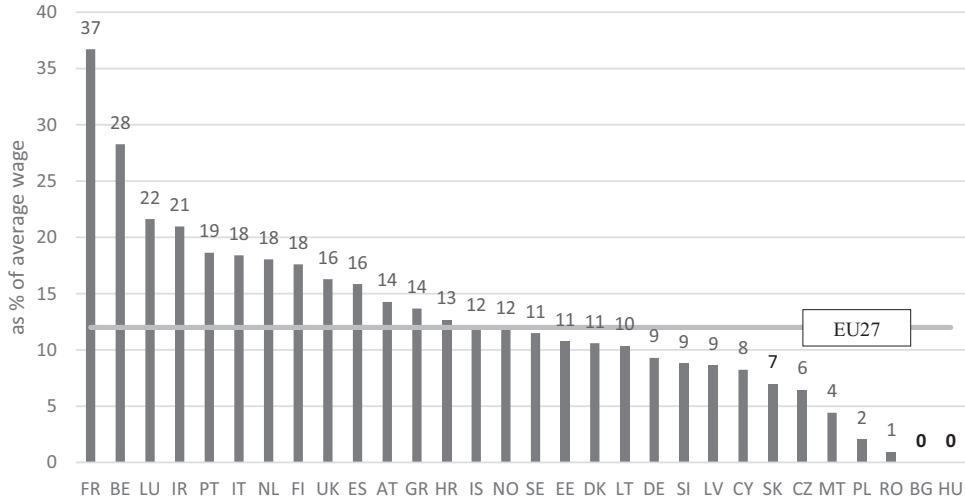

Fig. 2. The difference between the tax burden (tax wedge) of a single, childless employees' earning 50% and 167% of the average salary (2020)

Source: BI calculation based on the European Commission's "Tax and benefits indicators database".

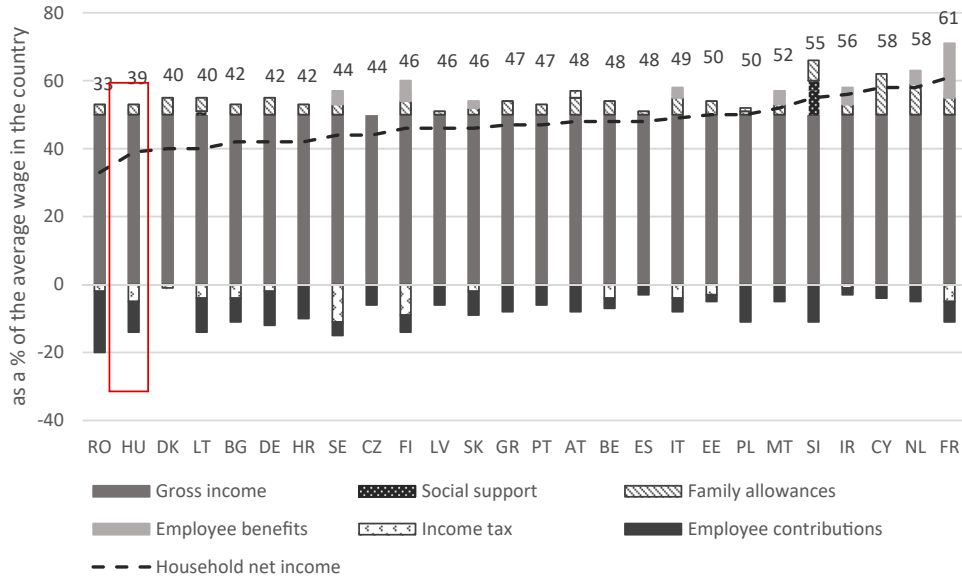

Fig. 3. Net income of single-earner families with one child earning 50% of the average salary, as a share of the average salary (2020)

Note: Actual net household income = gross household income (in this case 50% of the average salary in the country) – income tax – employees' contributions + social benefits + employee benefits + family allowances for one child. The countries are sorted in ascending order in terms of net income as a percentage of the average salary received.

Source: BI calculation based on the OECD tax-benefit calculator. https://www.oecd.org/els/soc/benefits-and-wages/tax-benefit-web-calculator/

considering both tax allowances and social benefits, the net income (as a share of the average wage) of low-income families with three children is close to the EU average (see Figure 4).

The tax allowance for higher-income families with three children is largely generous by international standards: the net income of a Hungarian single-earner family with three children earning twice the average salary[10] is higher than in all neighbouring countries. There are only four EU countries where three-child families receive more than in Hungary. These countries, however, also have higher family benefits, which also benefit poorer households (Figure 5).

4. ADMINISTRATIVE DATA ON TAXATION

We examine the redistributive effects of the income tax system using individually collected data on individual's tax and contribution declarations. In some respects, administrative databases of

[10]In Hungary, less than 5% of the taxpayers earn twice the average salary per year (around HUF 700,000 or EUR 2000 gross according to the OECD database).

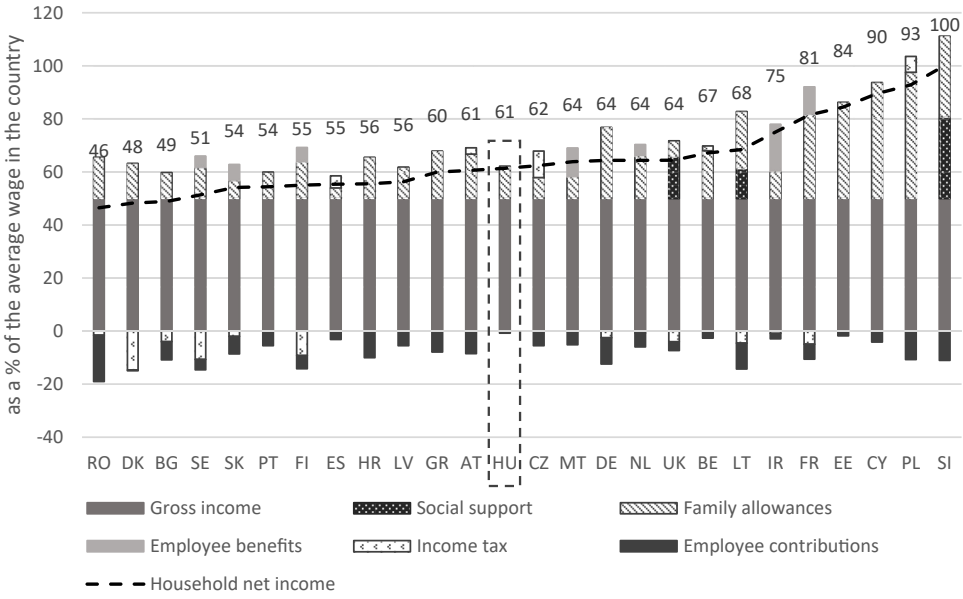

Fig. 4. Net income of single-earner families with three children earning 50% of the average salary, as a share of the average salary (2020)

Note: Actual net household income = gross household income (in this case 50% of the average wage in the country) – income tax – employees' contributions + social benefits + employee allowances + family allowances for three children. The countries are sorted in ascending order in terms of net income as a percentage of the average gross wage received.

Source: BI calculation based on the OECD tax-benefit calculator. https://www.oecd.org/els/soc/benefits-and-wages/tax-benefit-web-calculator/

individual income and tax payments are more accurate than population surveys. They include both the bottom and the top of the income distribution and are not biased by interviewer or respondent errors. Kis and Tóth (2016) compared administrative data with population questionnaire surveys (EU-SILC and the Tárki Monitor survey focusing on Hungarian households) and concluded that population surveys typically do not cover the top income percentiles of the income distribution, and that surveys tend to show a narrower spread than is actually the case.[11] It should be noted, however, that in other respects administrative databases are less representative of the actual situation of households. On the one hand, administrative databases consist of individual (not household) level observations, i.e., they do not show intra-household equalisation, as household members from the same household cannot typically be linked.

On the other hand, tax declarations also exclude revenues earned illegally and by avoiding taxation (potentially legally), as well as income from foreign investments and income taxed

[11] According to Kiss – Tóth (2016), the Tárki-Monitor survey also includes people in the top 92–95 percentiles, while EU-SILC coverage is lower at both ends of the income distribution.

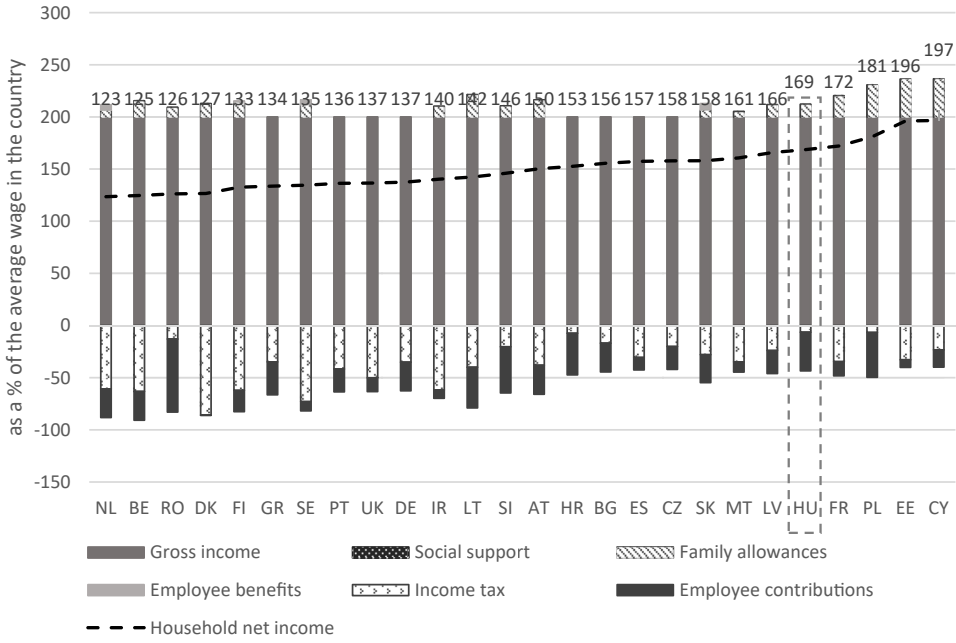

Fig. 5. Net income of single-earner families with three children earning 200% of the average salary, as a share of the average salary (2020)

Note: Actual net household income = gross household income (in this case 200% of the average wage in the country) - income tax - employee contributions + social benefits + employee allowances + family allowances for three children. The countries are sorted in ascending order of net income as a percentage of the average gross wage received.

Source: BI calculation based on the OECD tax-benefit calculator. https://www.oecd.org/els/soc/benefits-and-wages/tax-benefit-web-calculator/

abroad, and other revenue sources that are not included in tax declarations (such as fringe benefits and interest incomes). In spite of these limitations, the administrative data is still much better suited in comparing pre-tax and post-tax income than the household surveys.

The following administrative databases were used for the analysis:[12]

– The estimations for 2007 and 2011 were based on the database of the National Tax and Customs Authority (hereinafter: NTCA) containing data of a 10% random sample of individual anonymous income tax declarations ("Declaration no. 53").[13]

[12]The data used have been processed by the Databank of the Centre for Economic and Regional Studies. The calculations and conclusions drawn from them are the sole intellectual property of the authors.

[13]The data were cleaned by the central bank of Hungary (MNB), the Fiscal Responsibility Institute of Budapest (KFIB), the Budapest Institute for Political Analysis (BSZEI) and the Centre for Economic and Regional Studies (KRTK) in the framework for joint research activities.

– The calculations for 2020 were made using the database of the NTCA on individual anonymous legal relationships ("M" sheet of Declaration no. 08), which contains full data for the monthly declarations for March, April, May and October 2020. Data for these four months were annualized.

In addition to the anonymised individual-level datasets, we use aggregate data from the NTCA on the banded distribution of total income and family allowances in 2020.

The declarations on monthly contributions also include the monthly consolidated tax base, but not all income subject to the consolidated tax base (also included in the annual PIT declarations) is included in the monthly declarations submitted by employers. Therefore, the income distributions in these two types of declarations cannot be linked directly. For this reason, we are unable to examine the change in the overall income distribution and instead focus on the redistributive effect of taxation and the changes therein.

As No. 08 declarations do not include separately taxed income (e.g., capital income), the scope of the analysis is limited mainly to the tax and contribution burden on the consolidated tax base, and the family allowances. Using the data from 2011, we show that – similarly to other countries – the distribution of separately taxed income is much more uneven than that of the consolidated tax base, which comprises labour income (see Supplemental material 2, Figure 20). Since separately taxed income is also subject to a uniform tax rate of 15%, and accounts for 10% of the total consolidated income, our conclusions on the distributional effects of the income tax are not changed by the exclusion of separately taxed income.

A further limitation is that the above databases do not include those self-employed persons who do not have to file either tax declarations or monthly No. 08 declarations (e.g., self-employed persons subject to the "flat-rate tax for small taxpayers", or "KATA" scheme). Further, as there is no general wealth tax in Hungary, there is no comprehensive data on the stock and distribution of wealth. Therefore, the effects of the tax system on wealth distribution are not examined.

By analysing individual administrative databases and using descriptive statistics on the share and average tax burden of different income groups, we examine the distribution of tax burdens and tax allowances among the income groups of taxpayers, and the redistributive effect of the income tax system.

Taxpayers' incomes are divided into income percentiles and deciles according to the annual consolidated tax base. Those who declared an annual income of zero in a given year are excluded from the analysis.[14] It is important to note that the distribution of annual income is analysed, but many taxpayers do not have income for some months and do not necessarily have a full-time job.[15] As a result, those earning 12 times the monthly minimum wage are not at the bottom of the income distribution, but in the fourth decile, while those with average wage are in the eighth decile. The boundaries of each income group are shown in Table 3.

[14]As a basic rule, you do not have to file a tax return if you have no taxable income. One can have zero earnings for administrative reasons (for example claiming for a tax allowance from the previous year) or (simply denotes a data error).

[15]About one fifth of the taxpayers have no income each month, according to the 2011 "pay as you earn" (PAYE) database.

Table 3. Lower limits of deciles and percentiles of taxpayers' annual gross consolidated income, EUR

Deciles	2007		2011		2020	
	Annual	Monthly	Annual	Monthly	Annual	Monthly
2	1,494	125	1,140	95	1,775	148
3	2,821	235	2,376	198	3,379	281
4	3,546	296	3,398	283	5,504	459
5	4,159	347	4,075	340	7,199	600
6	5,052	421	4,846	404	8,405	700
7	6,199	517	6,007	501	10,197	850
8	7,359	613	7,326	610	11,997	1,000
9	9,566	797	9,505	792	14,846	1,237
10	13,829	1,153	13,882	1,157	20,658	1,722
Percentiles						
96	17,665	1,472	17,796	1,483	24,484	2,040
97	19,183	1,599	19,444	1,620	26,399	2,200
98	21,331	1,778	21,538	1,795	28,946	2,412
99	24,375	2,031	24,720	2,060	32,479	2,707
100	29,211	2,434	29,771	2,481	38,034	3,170
Top 0.1%	75,279	6,273	83,004	6,917	120,610	10,051
Maximum	1,387 474	115,623	1,976 412	164,701	4,658 120	388,177
# of taxpayers per decile	370,220		393,860		419,502	

Note: The income groups are based on total consolidated income.
Source: own calculation based on NTCA databases of PIT declarations (2007, 2011), and monthly "M08" declarations (2020). As data for 2007 and 2017 are derived from a 10% sample of taxpayers, the number of sample observations are multiplied by 10. The lower threshold of the minimum wage tax credit is the amount, where the total amount can be deducted. Above the phase-out threshold, the deduction is phased out gradually and goes to zero at about the double of the minimum wage.

Another limitation of our analysis is, that, while we can see income and claimed family tax allowances at an individual level in the tax and contribution declarations database, we cannot link taxpayers belonging to the same family. As family tax allowances can be claimed by one member of the household or shared between parents, we do not know the exact number of families benefiting from the allowance. The analysis of the distribution of the family tax allowance might be affected by this limitation, however, it's magnitude and direction are not clear. In a family with a high and low earner member, it may be optimal for the high earner to claim the credit.

To analyse the family tax allowances, we consider the sum of all types of family allowances. The NTCA' database on contribution declaration also includes the family allowances at the individual level, but based on the NTCA aggregate data of 2020, around 20% of the total amount is missing from the contribution declarations. This is due to the fact that taxpayers can claim the family allowances in their annual tax declarations. To estimate the impact of the family allowances, we estimate the missing data by income decile based on the aggregate family tax and contribution allowance data of 2020 available by the income bracket.

5. RESULTS

We analyse the redistributive effect of the income tax system in 2007, 2011 and 2020. In 2007, the personal income tax system was highly progressive and the tax burden on high incomes was particularly high relative to the EU countries. The comparison with 2011 may be interesting because the single rate tax system had already been introduced then, but due to the minimum wage tax credit system still in place, the average tax burden on lower incomes was much lower than on high incomes. In fact, the tax system, similarly to most of the other single-rate systems, did not completely lose its progressivity in 2011: thanks to the minimum wage tax credit, the consolidated tax base was tax-free up to the level of the minimum wage, after which the average tax rate gradually increased as the minimum wage tax credit decreased. Our most recent dataset is from 2020.[16]

5.1. The redistributive effect on income of the PIT

The redistributive impact of PIT can be assessed by analysing how the tax changes the share of total income received by each income group. Under a progressive tax system, those with higher incomes pay a larger share of their income in taxes, so their share of total income after tax decreases.

With the introduction of the flat tax system and the abolition of the minimum wage tax credit, the tax rate on consolidated income became the same for all income levels. However, tax allowances for children – depending on the number of children and the income level – significantly reduce the effective tax burden. Therefore, the actual redistributive effect of PIT depends on the income distribution of each beneficiary group and the use of the family tax allowance (see Section 2).

To calculate the total tax burden, both the PIT and employee contributions are taken into account. As Figure 6 shows, in 2020, the share of each consolidated income segment of the total pre- and post-tax income was almost equal. The bottom 50% of the taxpayers own about 20% of both the total consolidated pre-tax and after-tax incomes, while the top 10% own about one third thereof.

Figure 7 also demonstrates how the redistributive effect of PIT has changed. The tax system reduced the share of the top income decile in the total income by 4.6 percentage points in 2007

[16]Although the COVID-19 pandemic has had a significant effect on the labour market, calculations based on the data from 2019 yielded almost identical results to those based on the data from 2020, implying that the pandemic did not moderate the effect of the tax system on income distribution.

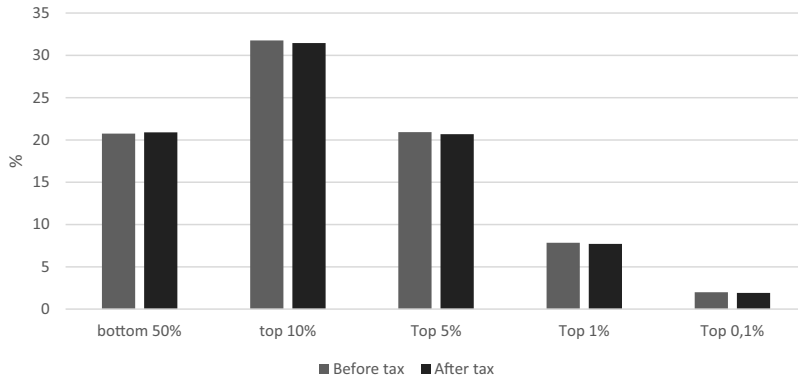

Fig. 6. Share of taxpayers' income groups in the consolidated income, before and after taxation (2020)
Note: The income groups are based on the individual's total consolidated income.
Source: Own calculation based on NTCA databases of PIT declarations (2007, 2011), and monthly "M08" declarations (2020).

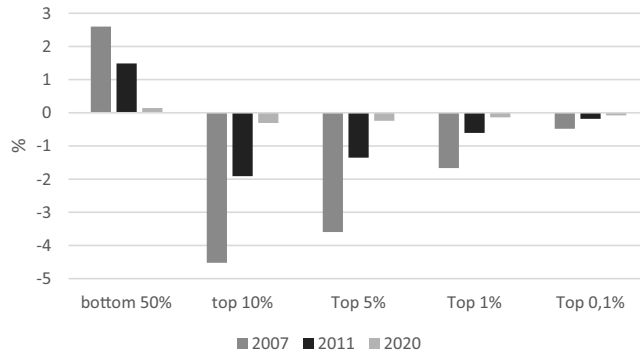

Fig. 7. Income redistributive effect of PIT: How did the tax change the share of income groups of taxpayers in 2007, 2011 and 2020?
Note: The graph shows the difference between the share of each income segment in the consolidated tax base, after and before tax.
Source: Own calculation based on NTCA databases of PIT declarations (2007, 2011), and monthly "M08" declarations (2020).

and by almost 2 percentage points in 2011, while increasing the share of the bottom 50%. The extent of income shifting is negligible in 2020. The income-shifting effect of the tax has weakened not only compared to 2007, but – mainly driven by the abolition of the minimum wage tax credit scheme in 2012 – also compared to 2011 (when the single-rate PIT had already been introduced).

The decline in the extent of income shifting is also reflected in the much smaller share of tax revenues coming from the top decile in 2020. In 2020, the top decile of taxpayers paid one-third of

the PIT of the total consolidated tax base, a significant drop compared to 2011, when the contribution of the top decile was 48% (Figure 8). The Lorenz curves (see Supplemental material 2, Figures 17–19) also demonstrate the decline in the redistributive effect of PIT.

Figure 9 shows the average tax burden on the consolidated tax base (that is, the sum of PIT on the combined tax base, employee social security contributions, and family tax and contribution allowances) in each income decile. Without the family tax allowance, the tax burden would be 33.5% (15% PIT + 18.5% social security contributions). The figure indicates that the

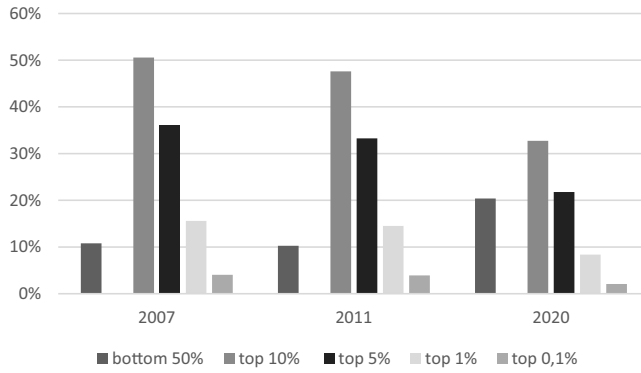

Fig. 8. Share of different income brackets of the total PIT payments on the consolidated income (%)
Note: The income groups are based on the individual's total consolidated income.
Source: Own calculation based on NTCA databases of PIT declarations (2007, 2011), and monthly "M08" declarations (2020).

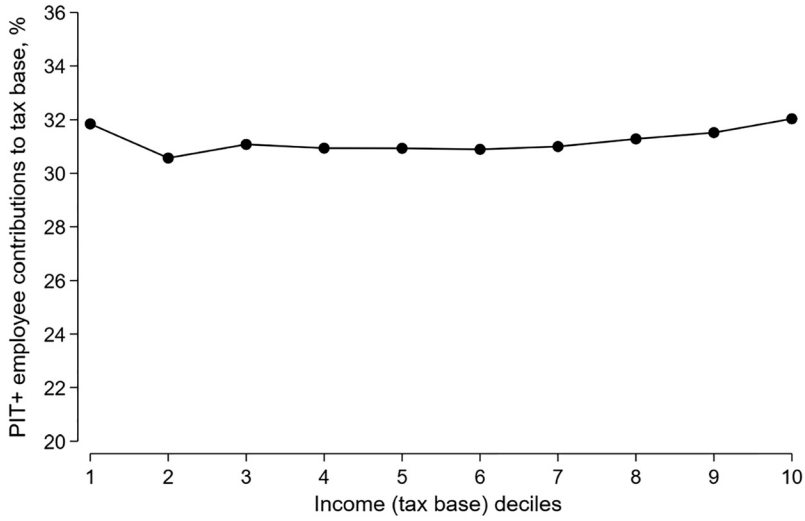

Fig. 9. Average tax burden in different income deciles (PIT + employees' contributions) (2020)
Source: Own calculation based on NTCA's database on M08 monthly contribution declarations of (2020).

effect of the family allowances on the overall tax burden and the distribution of the average tax burden is largely limited: the difference between the tax burden of the 2nd decile (which bears the lowest tax burden of 30.7%), and the 10th decile is only 1.5 percentage points. The income tax system is, therefore, closely proportional in practice, even taking into account the family allowances.

5.2. The family tax allowance

Although the family tax and contribution allowance can reduce the total tax burden from 33.5% to zero for families with three or more children (see Supplemental material 1), the allowance has a limited overall effect on the distribution and level of tax burdens. The difference in the burden of different income deciles does not exceed 1.5%.

One reason for this apparent contradiction is that only a small fraction of taxpayers is entitled to a substantive amount of allowance. In 2020, only less than a quarter of all taxpayers claimed family allowances. In addition, 47% of the recipients receive a tax allowance for one child only, which is relatively low: the tax base allowance for one child is only HUF 66700 (EUR 180) per month, with a net value of HUF 10000 (EUR 27) per month. To place the amount in context: EUR 27 is only 6% of the monthly minimum wage in 2020. 36% of the recipients of family allowances are parents of two children, and only one out of six claimants (17%) have three or more children (see Table 4). In light of these ratios, it is not surprising that the net value of the family tax and contribution allowances accounted for only 2% of the total consolidated income in 2020.

The international comparison (Section 3) showed that the current Hungarian tax system differs markedly from that of the neighbouring countries in two main aspects. First, the amount of the allowance increases at a remarkably steep rate with the number of children (up to four children). Second, the family allowances are exceptionally generous vis-á-vis high earners with three or more children. This latter feature is reflected in the distribution of the family allowances by income decile. Although from 2013 the allowance has been opened up to low earners with the

Table 4. Distribution of taxpayers according to the number of children among all taxpayers and recipients of tax (2020)

Number of children	Share of total taxpayers, %	Share of taxpayers with children, %
0	77	
1	11	47
2	8	36
3	3	14
4 or more	1	3

Note: The table does not show the actual number of taxpayer's children, but the proportion of taxpayers claiming family allowances. Taxpayers with children whose allowances are claimed by other family members belong to the "0 children" category in the table and the database.
Source: Own calculation based on NTCA databases of PIT declarations (2007, 2011), and monthly "M08" declarations (2020).

introduction of the family contribution allowance, the system still favours high earners, with the top deciles receiving a disproportionate share of the total of family allowances. The top decile receives around HUF 70 billion (EUR 200 million), which is more than the share of the bottom four deciles (around HUF 60 billion, or EUR 171 million) (Figure 10).

It is also important to note that the taxpayers in the top decile with at least three children- about 22,000 people (that is, 2% of all taxpayers with children) – receive 10% of the total of family allowances (ca. HUF 33 billion, EUR 94 million).

Therefore, although higher earners receive slightly less tax relief for their children relative to their income (see Figure 11), they receive much more than the low earners in absolute terms. While recipients in the lowest income decile receive less than 7,000 HUF (EUR 20) per month on average, those in the highest income decile receive almost 40,000 HUF (EUR 114) (Figure 12(a)).

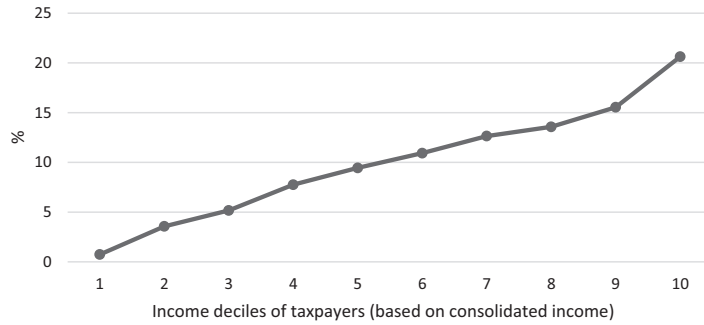

Fig. 10. Share of taxpayer deciles of family allowances (2020)
Note: The figure includes the family tax base and contribution allowances and the tax allowance for mothers with **four** children.
Source: Own calculation based on NTCA 08 monthly contribution data

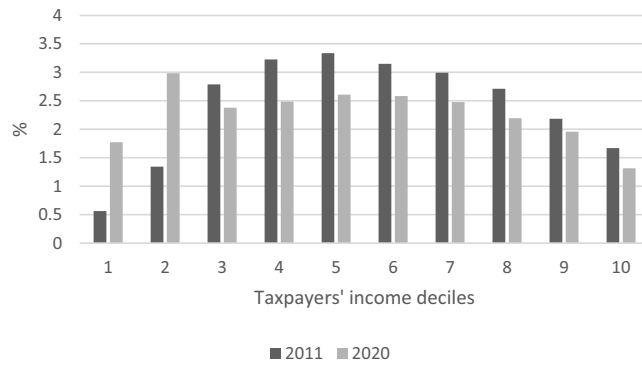

Fig. 11. Net value of family tax and contribution credits as a share of total consolidated income
Source: Own calculation based on NTCA databases of PIT declarations (2007, 2011), and monthly "M08" declarations (2020).

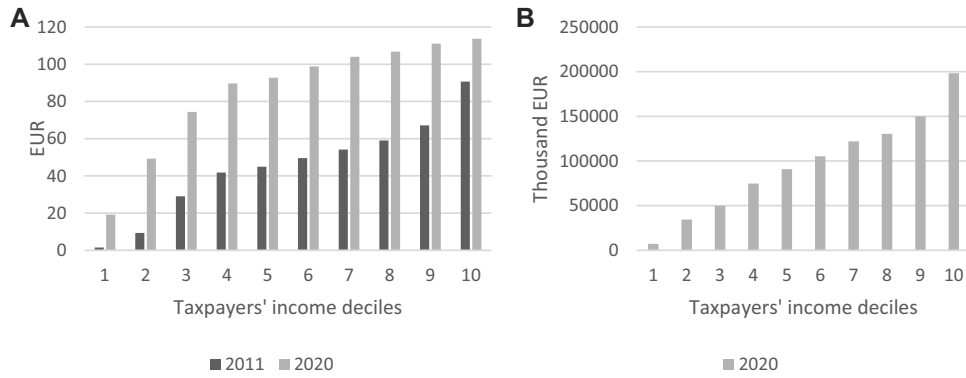

Fig. 12. Net value of the family tax and contribution allowances (A) Average monthly amount per person (among recipients), 2011 and 2020. (B) Total annual amount, HUF billion, 2020
Note: The income groups are based on the individual's total consolidated income.
Source: Own calculation based on NTCA 2007, 2011 PAYE and 2020 M08 monthly contribution data sets.

The total amount of family allowances rises even more steeply towards higher income deciles (see Figure 12(b)). This is because higher earners claim a higher share of family allowances: while one-third of the taxpayers in the top income decile benefit from the allowance, the share in the bottom decile is only 7%. This is partly due to the fact that higher income earners in a household claim a larger share of the allowance, as the allowance for three children may be fully used with an income of at least HUF 310,000 (EUR 883) per month and for two children with an income of at least HUF 120,000 (EUR 342) per month.[17]

Consequently, the child-related benefits – which in 2020 accounted for 2% of the total consolidated incomes, or HUF 337 billion (EUR 960 million), and was claimed by less than a quarter of taxpayers – did not substantially change the level and distribution of the overall tax burden. The allowance favours the high-income families with many children and does not provide substantial help to the lower-income single parents.

6. CONCLUSIONS

We examined the functioning of the Hungarian personal income tax system, focusing on the extent of redistribution between poorer and richer taxpayers, and between childless taxpayers and taxpayers with children.

Our results show that there is virtually no progressivity in the Hungarian income tax system: taxpayers without children are taxed at the same rate regardless of their income. In other words, the state deducts the same proportion of the salary of those earning very much and very little. This is

[17]According to the Hungarian Central Statistical Office, in the income distribution calculated on the basis of the equivalent per capita income in households, more than two thirds of children are in the bottom five income deciles.

very rare in the EU: apart from Hungary, only Bulgaria and Romania use similar systems. Most of the single-rate systems introduced in the post-socialist countries between 1994 and 2009 retained the minimum wage tax credit system, and most have since then reintroduced higher PIT rates.

The tax burden on labour around the minimum wage (including both employee and employer taxes and contributions) is the highest in the EU, making it more expensive to employ unskilled labour, and thus, potentially reducing job opportunities for unskilled jobseekers. The exceptionally high tax wedge is primarily driven by the absence of credits and allowances aimed at reducing the tax burden on low-income, childless taxpayers. In terms of the tax burden on high incomes, Hungary is middle-ranked among the EU member states.

The redistributive effect of the PIT has been reduced in two steps between 2010 and 2020: the single-rate PIT was introduced in 2011, whereas the minimum wage tax credit (which has reduced the tax burden on low incomes) was abolished in 2013. The latter was also relatively significant: while in 2011 the top decile of taxpayers paid almost half of the total of PIT payments, in 2020 they only paid its third. By contrast, the lower half of taxpayers paid 10% of PIT in 2011, and 20% in 2020.

Overall, the family allowances only triggered a very limited shift in the distribution of the average tax burden. Therefore, the income tax system can still be considered flat. One reason for this is that only 23% of all taxpayers claimed family allowances, and the net value of all these accounts for only 2% of the total combined income.

The other reason is that – although since it is deductible from contributions, lower income earners can make better use of it – the family allowance continues to favour higher income earners. In 2020, the top income decile of taxpayers received more than one-fifth of the total claimed tax allowances. That is, the top decile received HUF 70 billion (EUR 200 million) of the total amount of HUF 336 billion (EUR 960 million), which is more than the total amount received by the lowest four deciles (EUR 171 million). The top three income deciles received almost half of the tax allowance (HUF 161 billion, EUR 456 million). Although the share of allowances claimed relative to income is lower for the wealthier, the amount increases with income in absolute terms.

The amount of family allowances depends on the number of children: the more children in a family, the higher the amount per child. The net amount of the allowance for taxpayers with one child has been HUF 10,000 (EUR 27) per month since the introduction of the scheme, which did not offset the effect of the abolition of the minimum wage tax credit, so the tax burden for single taxpayers earning the minimum wage is about 9.5 percentage points higher in 2021 than in 2010. As for the distribution of recipients by the number of children, almost half of them claim the allowance for one child only, while only one in six recipients qualify for the allowance for three or more children.

The international comparison also shows that the family tax allowances for those with three or more children are relatively high compared to other EU countries, while the allowances for taxpayers with one child are rather low, and this disparity is not compensated by social benefits. Taxpayers with three or more children can still claim a large tax allowance even if they have high salaries.

The biggest winners of the family allowances are taxpayers in the top income decile with three or more children (ca. 22 thousand people). This group accounts for only 2% of all taxpayers receiving the family tax allowance, but receives 10% of the total family tax allowance,

which is almost one-third of the benefits claimed for three or more children, nearly HUF 34 billion (EUR 97 million).

Note that our analysis focuses on the redistributive effects of the income tax system and the related family allowances and does not examine the effects of value added tax (VAT). Due to data limitations, the redistributive impact of VAT could only be examined in a significantly more cumbersome and less precise way than that of the PIT system. Nevertheless, we also made "back of the envelope" estimates regarding the impact of VAT (Krekó et al. 2022). Despite methodological limitations, some main findings can be formulated with a high degree of certainty.

In Hungary – similarly to other countries – lower earners spend a much higher proportion of their income on consumption and less on savings than those at the top of the income distribution, so a higher proportion of their income is subject to consumption tax. Consequently, the rich pay less VAT than the low-paid relative to income, that is, VAT is regressive. In addition, as the average VAT rate is high, VAT has a stronger redistributive effect than in other countries. The regressivity of the tax burden over the life-cycle may be somewhat lower than the value calculated on the basis of current income, but given the low-income mobility, this is unlikely to change this pattern significantly. According to our rough "back of the envelope" estimate (see Supplemental material 3), the aggregate tax burden (including VAT) in Hungary decreases as the level of income increases, that is, the tax system is regressive. Those in the top income decile pay roughly 6–8% less income tax than those in the bottom income decile.

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SUPPLEMENTARY DATA

Supplementary data to this article can be found online at https://doi.org/10.1556/032.2023.00011.

REFERENCES

Adhikari, B. – Alm, J. (2016): Evaluating the Economic Effects of Flat Tax Reforms Using Synthetic Control Methods. *Southern Economic Journal*, 83(2): 437–463. https://doi.org/10.1002/soej.12152.

Bakos, P. – Benczúr, P. – Benedek, D. (2008): *Az adóköteles jövedelem rugalmassága. Becslés és egy egykulcsos adórendszerre vonatkozó számítás a 2005. évi magyar adóváltozások alapján* (The Elasticity of Taxable Income. Estimation Concerning a Hypothetical Flat Tax Reform based on Changes in the Tax System in 2005). *Közgazdasági Szemle*, LV, (9): pp. 733–762.

Barrios, S. – Ivaškaitė-Tamošiūnė, V. – Maftei, A. – Narazani, E. – Varga, J. (2020): Progressive Tax Reforms in Flat Tax Countries. *Eastern European Economics*, 58(2): 83–107. https://doi.org/10.1080/00128775.2019.1671201.

Benczúr, P. – Kátay, G. – Kiss, Á. (2018): Assessing the Economic and Social Impact of Tax and Benefit Reforms: A General-Equilibrium Microsimulation Approach Applied to Hungary. *Economic Modelling*, 75: 441–457. https://doi.org/10.1016/j.econmod.2018.06.016.

Benczúr, P. – Kátkay, G. – Kiss, Á. – Reizer, B. – Szobolszlai, M. (2011): Az adó- és transzferrendszer változásainak elemzése viselkedési mikroszimulációs model segítségével (Evaluation of the Changes of the Tax- and Transfer System based on a Behavioural Microsimulation Model). *MNB Szemle*, 15–27.

Benedek, D. – Lelkes, O. (2006): A magyarországi jövedelem-újraelosztás és egy egykulcsos adóreform vizsgálata mikroszimulációs modellel (Income Redistribution in Hungary and Evaluation of a Hypothetical Flat Tax Reform based on a Microsimulation Model). *Közgazdasági Szemle*, LIII(7): 604–623.

Davies, J. B. – Hoy, M. (2002): Flat Rate Taxes and Inequality Measurement. *Journal of Public Economics*, 84(1): 33–46. https://doi.org/10.1016/S0047-2727(01)00110-4.

Enami, A. (2018): Measuring the Redistributive Impact of Taxes and Transfers in the Presence of Reranking. In: Lusting, N. (ed.): *Commitment to Equity Handbook: Estimating the Impact of Fiscal Policy on Inequality and Poverty*. Chapter 3. Washington, D.C.: Brookings Institution Press, pp. 116–174.

Erdős, T. (2012): Egykulcsos jövedelemadó és gazdasági növekedés (Flat Income Tax and Economic Growth). *Közgazdasági Szemle*, LIX(2): 109–138.

Filer, R. K. – Hanousek, J. – Lichard, T. – Torosyan, K. (2019): Flattening' Tax Evasion? *Economics of Transition and Institutional Change*, 27(1): 223–246. https://doi.org/10.1111/ecot.12189.

Hall, R. E. – Rabushka, A. (2007): *The Flat Tax.* (2nd ed.) Stanford: Hoover Institution Press.

Hallaert, J. J. (2020): *Poverty and Social Protection in Bulgaria*. IMF Working Paper, No. 20/147. https://ssrn.com/abstract=3721188.

Ivanova, A. – Keen, M. – Klemm, A. – Pestieau, P. – Velasco, A. (2005): The Russian 'Flat Tax' Reform. *Economic Policy*, 20(43): 399–444.

Keen, M. – Kim, Y. – Varsano, R. (2006): *The "Flat Tax(es)": Principles and Evidence*. IMF Working Paper, No. 06.

Kis, A. B. – Tóth, I. G. (2016): *Makro sokkok – Mikro válaszok: Sikeres és sikertelen háztartási alkalmazkodás a válság idején Magyarországon* (Macro Shocks – Micro Responses: Successful and Unsuccessful Adaption Strategies of Households during the Crisis in Hungary), Vol. 2. Budapest: Tárki Houshold Monitor.

Kiss, Á. – Mosberger, P. (2015): The Elasticity of Taxable Income of High Earners: Evidence from Hungary. *Empirical Economics*, 48(2): 883–908. https://doi.org/10.1007/s00181-014-0809-7.

Krekó, J. – Erős, H. – Greskovics, B. – Hajnal, Á. – Lawson, A. – Scharle, Á. (2022): *A magyar adórendszer újraelosztási hatásai* (The Redistributive Effects of the Hungarian Tax System). Budapest Institute for Policy Analysis Ltd. http://www.budapestinstitute.eu/uploads/BI_adorendszer_ujraelo_hatas_2022.pdf.

Saavedra, P. (2007): Flat Income Tax Reforms. In: Gray, C. – Varoudakis, A. – Lane, T. (eds): *Fiscal Policy and Economic Growth: Lessons for Eastern Europe and Central Asia*. World Bank. https://doi.org/10.1596/978-0-8213-7181-7.

Svraka, A. (2021): Recent Trends in Income Inequalities in Hungary Using Administrative Data. In: *Taxation Working Papers,* No. 8, Ministry of Finance, Department of Tax Policy and International Taxation. https://ideas.repec.org/p/auo/moftwp/8.html.

Tanchev, S. (2021): How the Proportional Income Taxation Increases Inequality in Bulgaria. *Journal of Tax Reform, Graduate School of Economics and Management, Ural Federal University*, 7(3): 244–254.

Tóth, G. C. – Virovácz, P. (2013): Nyertesek és vesztesek: A magyar egykulcsos adóreform vizsgálata mikroszimulációs módszerrel (Winners and Losers: Evaluation of the Hungarian Flat Tax Reform based on a Microsimulation Model). *Pénzügyi Szemle*, 58(4): 385–400.

Varsano, R. – Keen, M. – Kim, K. – Varsano, R. (2006): *The 'Flat Tax(es)': Principles and Evidence*. IMF. http://elibrary.imf.org/view/IMF001/06782-9781451864786/06782-9781451864786/06782-9781451864786.xml.

Voinea, L. – Mihaescu, F. (2009): The Impact of the Flat Tax Reform on Inequality – The Case of Romania. *Journal for Economic Forecasting, Institute for Economic Forecasting*, 4: 19–41.