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## Abstract:

This paper provides an up-to-date analysis of the redistributive effects of the Czech tax and benefit system at the household level. We provide several measures of the extent in which the tax and benefit system redistributes from the rich to the poor and from the childless households to the households with children. We find a rather weak combined power of the tax and benefit systems in alleviating income inequalities. The system redistributes primarily towards households with children. While households with children earn 55 per cent of total earnings, they pay 39 per cent of total taxes and receive 68 per cent of total benefits. Even the richest households with children contribute a lower share of total net taxes (8 per cent) than their share in total earnings (10 per cent). About a quarter of households with children in the upper income deciles collect some benefits while only half of the poorest households without children do.

**Keywords:** TAXBEN models, redistribution, income inequality, Czech Republic

**JEL Classification:** H22, H24, H55, I38

## 1. Introduction

Taxes on earnings constitute a majority of tax revenues in the Czech Republic (CZK 744 billion), and CZK 93 billion is then spent on social benefits other than pensions.<sup>1</sup> Understanding the redistributive effects of the tax and benefit systems and their impact on inequality is crucial for guiding the design of the tax and benefit systems in the future. Recently, the issues of micro-level impact of tax and benefit systems and optimal tax design gained renewed interest in the public finance literature (see *e.g.* Mirrlees 2010a, 2010b; Paulus *et al.*, 2009; Immervoll, 2004).

This paper contributes to the evidence-based approach to tax policy. Despite many recent reforms, the evidence-based evaluation of tax policies, either *ex-ante* or *ex-post*, has been largely missing in the Czech Republic. We explore the redistributive impact of the tax

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1 Source: Fiscal Outlook of the Czech Republic (May, 2013), Table B.2., Ministry of Finance, available at <http://www.mfcr.cz/en/statistics/fiscal-outlook/2013/fiscal-outlook-05-2013-12701>, and Ministry of Labour and Social Affairs: <http://www.mpsv.cz/cs/15483> (last accessed on July 19, 2013).

and benefit systems in the Czech Republic across households by household earnings and the presence of children. We address questions such as: How progressive are the taxes and benefits at the household level? How much does the system redistribute from the childless households to the households with children as opposed to redistributing from the rich to the poor? To what extent do households with similar earnings pay similar taxes and receive similar benefits? We answer these questions with a newly developed TAXBEN model that uses the Living Conditions survey (SILC), a representative sample of 8,866 Czech households.

Several academic papers have explored the distributional measures of the Czech tax-and-benefit system. Večerník (2006) uses the Czech Microcensus survey in 1988, 1996, and 2002. He describes the redistribution *via* the tax-and-benefit system at household level, focusing on the change in redistribution during years of transition from central planning to market economy. Schneider and Jelinek (2005) investigate the distributive impacts of particular welfare benefits and tax allowances and the trends in their relative generosity, using the Household Budget Surveys in 1999–2002. Dušek, Kalíšková, and Münich (2013) present the average, marginal, and participation tax rates at the individual level.

Recently, there has been an expansion in the literature providing inter-national comparisons of the redistributive properties of the tax-benefit systems.<sup>2</sup> Immervoll *et al.* (2005) explore impact of taxes and benefits on income inequalities in the EU-15 countries for 1998 and compare the effectiveness of individual policies at reducing income disparities. There are several recent papers that focus on redistributive effects of tax-and-benefit policies and their impact on poverty in the EU countries (see *e.g.* Avram *et al.*, 2012; De Agostini *et al.*, 2014). Paulus *et al.* (2009), a study that is methodologically closest to, examines how taxes and benefits shape income distributions in 19 EU countries<sup>3</sup> using the EUROMOD model and policy years 2001, 2003, or 2005. Our TAXBEN model is tailored for the Czech tax and benefit system and for the available Czech data. It therefore captures finer details of the national system than EUROMOD.<sup>4</sup> It fits in the tradition of similar country-specific microsimulation models (*e.g.* NBER's TAXSIM model for the United States - Feenberg and Coutts, 1993; the IFS's TAXBEN model for the United Kingdom - Giles and McCrae, 1995).

This paper brings several contributions. First, we provide an up-to-date analysis of the redistributive effects of the Czech tax and benefit systems. The most recent Czech studies on redistribution (Schneider and Jelinek, 2005; Večerník, 2006) are based on the tax-benefit system from 2002. However, the system underwent frequent modifications during the past decade<sup>5</sup> and the existing TAXBEN-type studies of the current system

2 These studies mostly use the EU-wide tax-benefit microsimulation model EUROMOD. See Sutherland (2007) or <https://www.iser.essex.ac.uk/euromod> for more information about the EUROMOD model.

3 EU-15, Estonia, Hungary, Poland, and Slovenia.

4 For example, deductions from taxable income, tax credits for disability, the differentiation of the minimum tax bases for the health and social security contributions by the months of self-employment and the type of income, *etc.*

5 In 2005, joint taxation of married couples with children was introduced. In 2006, the many deductions from taxable income were replaced by tax credits. In 2007, the concept of a minimum living standard was changed, and an existence minimum was introduced. In 2008, a flat 15

focused on work and other behavioural incentives (Pavel, 2009; Galuščák and Pavel, 2012; Dušek, Kalíšková and Münich, 2013). We provide an update on the redistributive properties of the tax-and-benefit system reflecting the legislation in force in 2013, and some comparisons with other EU countries.<sup>6</sup>

Second, we contribute to the ongoing policy debate about tax reliefs and benefits supporting the households with children. Using a representative dataset of households we show how the taxes and benefits differ across real households with and without children and with varying income levels. We document the extent in which the tax and benefit system already redistributes towards the families with children and how such support depends on income.

Third, the paper brings some methodological improvements. Our TAXBEN model simulates direct taxes and social benefits based on the current legislation and captures some features that are not commonly captured in micro-simulations, such as mortgage deductions, disability tax credits, *etc.* We also document the dispersion of tax and benefit rates across households with similar earnings. Our approach follows the standards of the Mirrlees Review.<sup>7</sup> Most importantly, we measure the full tax wedge between the net disposable income and the employer cost or the pre-tax profit.

Among the key findings, we find that the redistributive effects of the tax and benefit systems along the income dimension are rather modest. The tax system itself is only slightly progressive. While the tax credits and the benefit system creates some progressivity in the bottom half of the income distribution, the combined power of the tax and benefit systems reduces the Gini coefficient by 8 percentage points. This is a rather small reduction in international comparison.

On the other hand, the system redistributes primarily from childless households towards households with children. While households with children earn 55 per cent of total earnings, they pay 39 per cent of total taxes and receive 68 per cent of total benefits. Even at the top incomes, the redistribution towards the households with children overrides the redistribution from the rich to the poor. The households with children in the 10<sup>th</sup> and 9<sup>th</sup> income deciles earn 10 and 7 per cent of total earnings but pay only 8 and 5 per cent of total net taxes. About a quarter of households with children in the upper income deciles collect some benefits while only half of the poorest households without children collect some benefits. The main reason for such redistributive outcomes are generous benefits and tax credits that are not means-tested (maternity and parental leave benefits and the child tax credit).

The rest of the paper is organized as follows. Section 2 describes the main features of the TAXBEN model and the data. Section 3 presents the results. The description of the results is purposefully factual and free of normative recommendations. We reserve some normative assessments for the conclusions in Section 4.

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per cent income tax rate replaced a progressive rate structure, and the joint taxation of couples was abolished. A new flexible system of the parental leave benefit was introduced and the child allowance benefit was reformed. In 2011, birth grant became a means-tested benefit and available for the first child only. In 2012, the parental leave benefit was made even more flexible and the social supplement benefit was abolished. In 2013, a special surcharge on high earners was added.

6 For details on the main parameters of the Czech tax and benefit system, see the companion paper Dušek, Kalíšková and Münich (2013).

7 Mirrlees (2010a), Chapter 4.

## 2. The TAXBEN Model and Data

### 2.1 Data

We developed a new TAXBEN model that simulates the taxes and benefits for individuals and households in the representative “Living Conditions” (SILC) dataset. The SILC is being collected annually by the Czech Statistical Office as a part of the EU-SILC Project. We used the latest available SILC issue (collected in 2011, it provides information on incomes during year 2010) which contains information on 8,866 households consisting of 20,629 individuals. It reports information about the household structure, its dwelling, and the economic activity and health of the household members. Importantly for tax simulations, it reports each member’s annual earnings from employment and annual profits from small business (self-employment). It further reports the levels of various welfare benefits received by the household, the income taxes, social and health contributions (for employees only).

SILC is well suited for TAXBEN-type simulations. It is relatively large, representative (including weights allowing to extrapolate to the population), and contains sufficient amount of income and demographic information to capture the key aspects of the tax and benefit system. One disadvantage of the SILC is likely under-reporting of capital income - interest, dividends, rents *etc.* Even though such items exist in the database, their values are frequently zero or unrealistically low. We cannot therefore include taxation of capital income into the analysis but focus solely on earnings from wages or self-employment.

### 2.2 Definitions of the main concepts and model simulations

To describe the distributional effects of the tax and benefit system, we use the concepts of average tax, benefit, and net tax rates at the household level. These describe the total taxes, benefits and net taxes as fractions of the full household earnings. Therefore, these indices can be calculated for households with positive earnings only, and we thus complement them with information on average amounts of taxes, benefits, and net taxes paid and received by all households including households without earnings in the analysis below.

The *average tax rate* is the ratio of total taxes paid by all household members  $T^h(Y^h)$  to the full household earnings ( $Y^h$ ):

$$ATR^h = \frac{T^h(Y^h)}{Y^h} \quad (1)$$

The *average benefit rate* is the share of total benefits received by household members  $B^h(Y^h)$  of the full household earnings ( $Y^h$ ):

$$ABR^h = \frac{B^h(Y^h)}{Y^h} \quad (2)$$

The *average net tax rate* describes the combined effect of tax-and-benefit system and is defined as total net taxes paid by the household (taxes paid decreased by benefits received) over the full household earnings ( $Y^h$ ):

$$ANTR^h = \frac{T^h(Y^h) - B^h(Y^h)}{Y^h} \quad (3)$$

The full household earnings ( $Y^h$ ) are defined as a sum of earnings from business (gross profit before taxes and contributions), and work (total employer cost, *i.e.* the sum of the gross wages and social and health contributions paid by the employer) for all household members. Taxes  $T^h(Y^h)$  include direct taxes only – personal income tax and mandatory health and social security contributions.

Benefits  $B^h(Y^h)$  include maternity benefit (*peněžitá pomoc v mateřství*), birth grant (*porodné*), child allowance (*příspěvky na děti*), housing benefit (*příspěvek na bydlení*), and aid in material need benefits: living allowance (*příspěvek na živobytí*) and housing supplement (*doplatek na bydlení*). These benefits are simulated in the model, while we also include reported values of benefits that cannot be simulated in the model - unemployment benefits (*podpora v nezaměstnanosti*) and parental leave benefit (*rodičovský příspěvek*). Simulations of benefits that have low take-up rates (housing benefit and aid in material need) are based on a model that predicts the take-up by each eligible household; the benefit amounts and benefit rates reported below already reflect the predicted take-up and not the mere eligibility for these benefits. For details on the tax and benefit simulations, we refer the reader to a companion paper (Dušek, Kalíšková and Münich, 2013) and an on-line appendix.<sup>8</sup>

We normalize earnings, taxes, and benefits by the OECD consumption units<sup>9</sup> to reflect the household size and composition. Households are divided into income deciles based on equivalised gross household earnings (*i.e.* total gross earnings – excluding employer contributions – of all household members normalized by the OECD consumption units).<sup>10</sup> This approach has one advantage: Households with the same equivalised earnings should have the same living standards irrespective of the specific composition of the households (to the extent that the OECD consumption units accurately reflect the impacts of additional household members on the consumption of individual members). Comparing differences in net taxes across households with different equivalised gross earnings captures redistribution based on pre-tax living standards. Comparing differences within household groups with the same equivalised gross earnings captures additional redistribution based on dimensions other than the pre-tax living standards; specifically in this paper, we compare households with and without children.

8 [http://idea.cerge-ei.cz/files/taxben\\_append\\_en.pdf](http://idea.cerge-ei.cz/files/taxben_append_en.pdf)

9 Number of consumption units in a household is a sum of the weights for all household members. Weights are defined as follows: 1 for the head of household; 0.7 for all other household members aged above 13; and 0.5 for children aged 0 to 13.

10 The use of the so called “equivalised” earnings is common in the literature; see *e.g.* Večerník (2006) or Paulus *et al.* (2009).

## 2.3 Summary statistics of the sample

Table 1 shows basic summary statistics separately for households without and with children. We exclude households with at least one inactive pensioner and no potential earner in productive age from the whole analysis.<sup>11</sup> We thus restrict our sample to 5,794 non-pensioner households, which corresponds to over 3 million households in the Czech population (out of 4.38 million total households).<sup>12</sup>

**Table 1 | Summary Statistics of Households (means and standard deviations)**

	Households without children		Households with children		Total	
	Mean	Std. dev.	Mean	Std. dev.	Mean.	Std. dev
<b>Number of HHs (population)</b>	1,614,954	2,829,561	1,441,622	223,435	3,056,576	3,052,996
<b>Number of HHs (sample)</b>	3,171	5,362	2,630	432	5,801	5,794
<b>Income from work and business</b>	397,816	335,567	474,131	360,695	433,810	349,726
<b>Income from work</b>	309,500	270,546	362,894	301,758	334,683	286,933
<b>Income from business</b>	88,316	252,432	111,238	293,432	99,127	272,779
<b>Gross income per OECD unit</b>	230,379	191,653	179,489	139,001	206,377	170,778
<b>Income tax paid</b>	36,735	50,212	26,842	59,845	32,069	55,188
<b>Payroll tax paid</b>	159,842	121,460	188,352	126,843	173,289	124,842
<b>Benefits received</b>	9,607	26,740	34,388	48,757	21,295	40,645
<b>Percentage of households eligible for some benefits</b>	23%	0.42	52%	0.50	36%	0.48
<b>Net tax paid</b>	186,969	172,853	180,807	199,616	184,063	185,981
<b>Net income per OECD unit</b>	181,864	131,156	157,293	93,424	170,275	115,567
<b>Number of OECD consumption units in a household</b>	1.78	0.66	2.67	0.65	2.2	0.79
<b>Number of children</b>	0.02	0.14	1.6	0.76	0.77	0.95
<b>Age of head of household</b>	49.17	13.13	40.66	8.72	45.16	12.04

11 We exclude these “pensioner” households from the analysis, because we do not account for old-age pensions in our tax-benefit system (old-age pensions are not a standard social benefit, and lack of previous income data in the SILC does not allow us to simulate old-age pensions). Inactive pensioner is defined as an individual in the retirement age reporting inactivity, while potential earner is a person aged between 18 and retirement age, who is not a full-time student and does not have serious health problem. Our sample thus excludes all households consisting of inactive pensioners only, but includes multi-generational households, where there are some productive-age individuals living together with their retired parents.

12 All the summary statistics reported here and below are based on a sample from the SILC 2011 data, which is reweighted by sampling weights to correspond to actual population size in the Czech Republic.

All incomes, taxes and benefits reported here and below correspond to yearly amounts. Households with children are slightly less numerous than households without children. They have higher total gross income than households without children (CZK 474,000 *per* year compared to CZK 398,000) but lower equivalised income (CZK 179,000 compared to CZK 230,000) because they are larger. Differences in equivalised net income are less pronounced: CZK 157,000 for households with children and CZK 182,000 for households without children which indicates the degree in which the tax and benefit system redistributes towards households with children. Over half of households with children collect some benefits while only 23 per cent of households without children do.

### 3. Results

#### 3.1 Average rates of taxes, benefits and net taxes

Table 2 tabulates the annual average tax, benefits, and net tax rates by household income deciles for households with positive earnings. An average household without children pays 38 per cent of its full earnings in taxes and receives 4 per cent of its full earnings back in benefits. An average household with children pays 34 per cent of its full earnings in taxes but receives 14 per cent of its full earnings back in benefits. Hence the resulting gap in the net tax rates is 14 percentage points.

**Table 2 | Household Tax, Benefit, Net Tax Rates**

Household income decile	Gross equivalised income	Average tax rate		Average benefit rate		Average net tax rate		Net equivalised income	
		Households without children	Households with children	Households without children	Households with children	Households without children	Households with children	Households without children	Households with children
1	7,617	0.41	0.21	0.80	2.03	-0.39	-1.82	24,690	47,097
2	69,295	0.35	0.25	0.11	0.23	0.24	0.02	66,915	85,453
3	104,015	0.36	0.30	0.04	0.12	0.32	0.18	91,178	109,203
4	132,808	0.36	0.33	0.03	0.07	0.33	0.26	113,340	127,595
5	161,038	0.36	0.36	0.02	0.04	0.34	0.32	133,788	143,885
6	191,390	0.37	0.37	0.02	0.03	0.36	0.35	157,847	162,228
7	227,540	0.39	0.37	0.01	0.02	0.38	0.35	183,278	185,284
8	272,199	0.40	0.39	0.00	0.02	0.39	0.37	214,464	217,858
9	334,370	0.40	0.39	0.00	0.02	0.40	0.38	257,743	258,764
10	564,406	0.41	0.40	0.00	0.02	0.41	0.39	406,407	420,682
Average	206,377	0.38	0.34	0.04	0.14	0.34	0.20	181,864	157,293

Note: Only non-pensioner households with positive earnings. Household income deciles are defined based on gross equivalised household earnings. All incomes are in CZK and correspond to yearly values. All values are weighted by population weights.

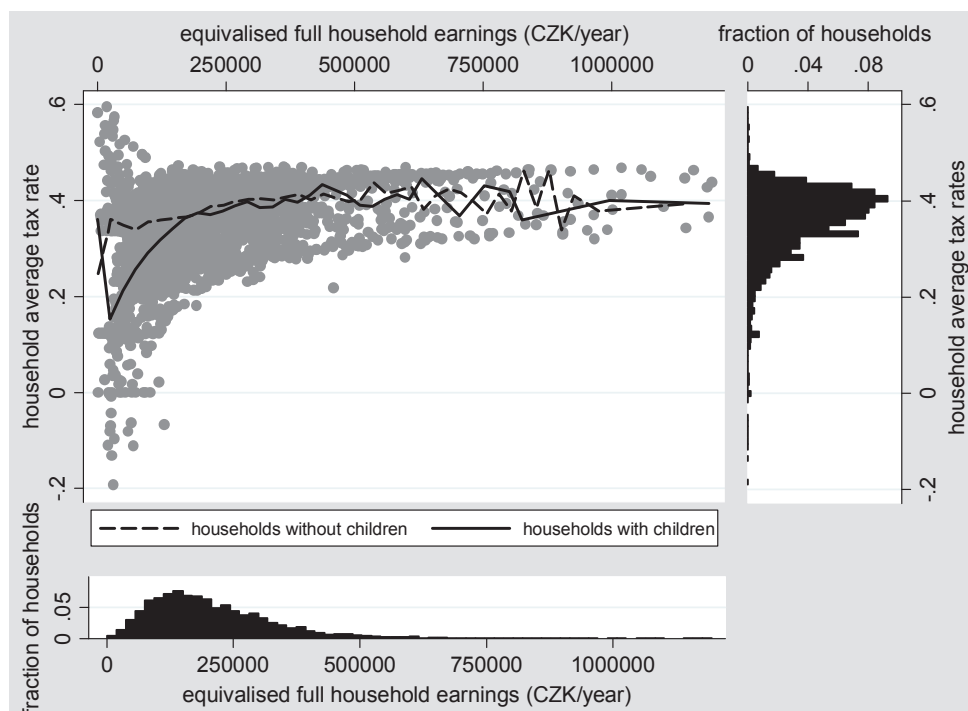
Source: SILC 2011, TAXBEN model based on 2013 legislation.



Taxes are only slightly progressive for households without children; the average tax rate gradually rises from 35 to 41 percent from the second to the top decile and the first decile actually faces the same average tax rate as the top decile. Taxes are far more progressive for households with children due to child tax credits. The size of the child tax credit does not vary with income<sup>13</sup> and can have the form of a negative income tax. Therefore they represent a far larger percentage reduction in the tax paid for the low-income households.

Figure 1 plots the household average tax rates and their distribution against equivalised gross household earnings. This figure conveys similar information as Table 2, but also demonstrates the dispersion in the tax rates across households. The “bandwidth” between the highest and lowest average tax rate for the same level of earnings is around 20 percentage points at most levels of equivalised earnings. This is driven mainly by differences in taxation of employees and self-employed, and by the presence of generous tax credits for households with children and only one earner (for details, see the companion paper Dušek, Kalíšková and Münich, 2013). The dashed and solid lines depict the population means for the households without and with children, respectively. They clearly depict the differences in taxes between households with and without children at lower income deciles.

**Figure 1 | Distribution of Household Average Tax Rates in the Population of Czech Households**



Note: Only non-pensioner households with positive earnings are shown.

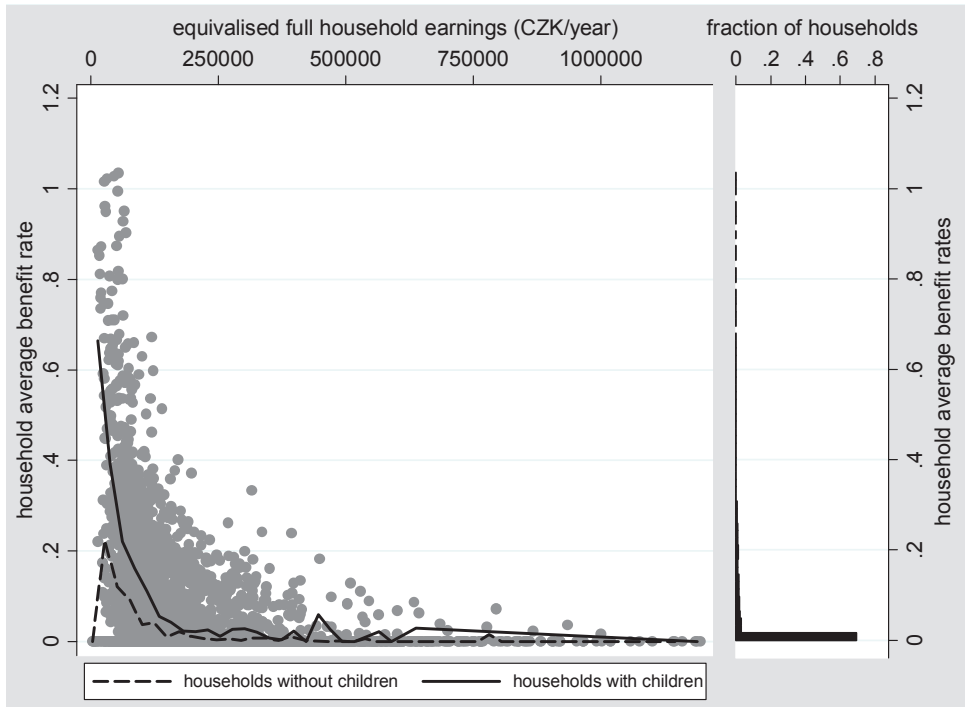
Source: SILC 2011, TAXBEN model based on 2013 legislation

13 The credit is CZK 13,404 *per* child according to 2013 legislation.



The average benefit rate at the lowest levels of earnings varies greatly and exceeds 1 for some taxpayers, but then falls rapidly to 3 per cent once equivalised earnings exceeds CZK 150,000 and then converges to almost zero (see Figure 2). The disparities in benefits are substantial. In the first two deciles, there are households whose benefits exceed their earnings as well as households who receive no benefits. The solid line illustrates that the low-income households with children collect much higher benefits than childless households with similar incomes. Even in the upper part of income distribution (7<sup>th</sup> to 9<sup>th</sup> income decile), the average benefit rate is about 2 per cent for households with children but zero for households without children.<sup>14</sup>

**Figure 2 | Distribution of Household Average Benefit Rates**



Note: Only non-pensioner households with positive earnings are shown.

Source: SILC 2011, TAXBEN model based on 2013 legislation

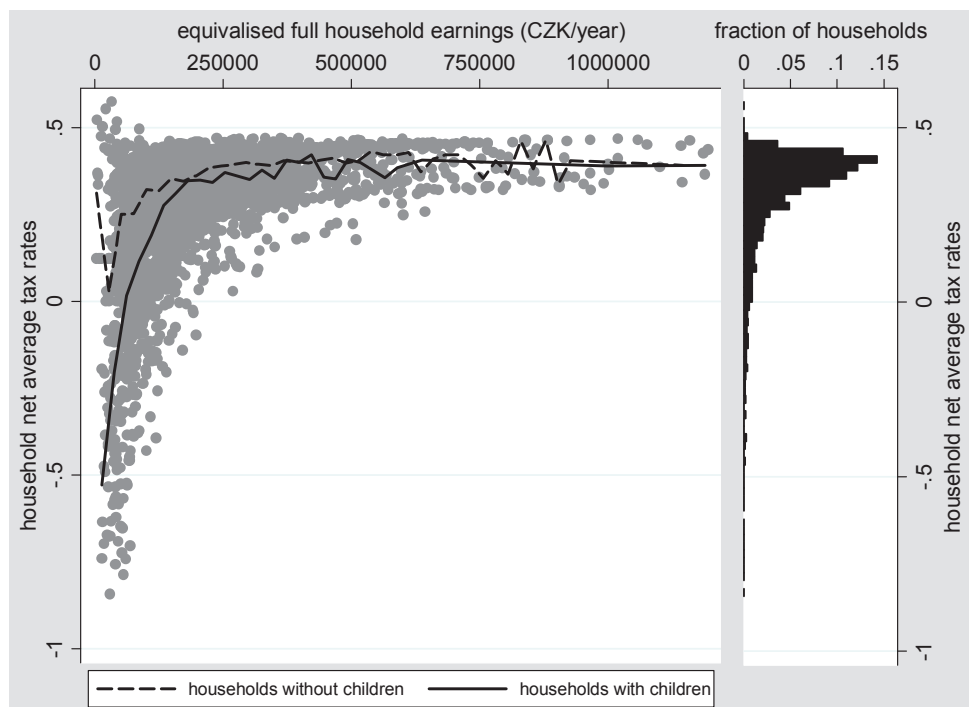
Figure 3 and the rightmost panel of Table 2 depict the joint distributional effect of the combined tax-and-benefit system. The differences in net tax rates between the households with and without children are most pronounced at the lowest income deciles. Only households in the first decile receive more in benefits than they pay in taxes. Those without children face a net tax rate of minus 39 per cent compared to minus 182 per cent

14 This is again due to the entitlement to parental allowance and maternity leave benefits, which are the both very important in magnitude and are not means tested.

for households with children.<sup>15</sup> This net tax rate gap gradually narrows to 2 percentage points in the 5<sup>th</sup> and higher deciles, as the net tax rates converge to 41 per cent for households without children and 39 per cent for households with children. Both taxes and benefits contribute to this gap between households without and with children; however, benefits are quantitatively more important.

As Figure 3 illustrates, the combined tax and benefit system is progressive up to equivalised income of CZK 400,000 and it is approximately proportional at higher incomes. It is visibly more progressive for households with children. The disparities in net tax rates are more pronounced than the underlying disparities in the tax and benefit rates, particularly at low earnings. There are households with the same equivalised earnings facing net tax rates as high as 40 per cent as well as households receiving equally large net subsidies. At higher earnings levels, there is still a fairly wide “bandwidth” of approximately 20 percentage points.

**Figure 3 | Distribution of Household Net Average Tax Rates**



Note: Only non-pensioner households with positive earnings are shown.

Source: SILC 2011, TAXBEN model based on 2013 legislation

<sup>15</sup> The very high negative net average tax rates in the first decile are crucially driven by very low denominator (average annual gross earnings in the first decile is CZK 7,600 *per unit*), rather than very high benefits.

The final columns of Table 2 show how the taxes and benefits translate into the equivalised net incomes. In every decile, the net incomes of households with children are greater than net incomes of childless households with the same gross equivalised income. In the poorest decile, the tax and benefit system elevates the equivalised incomes of households with children to twice the amount of households without children (CZK 47,100 and 24,700, respectively). In the 2<sup>nd</sup> through 4<sup>th</sup> deciles, the net equivalised incomes of households with children are substantially greater than the net incomes of childless households with the same gross income; the difference becomes much less significant in higher deciles.

### 3.2 Identifying benefit recipients and net taxpayers

**Table 3 | Household Benefits and Net Taxes - Positive Values Only**

Household income decile	Share with positive benefits		Benefits received per unit if positive		Share with positive net taxes	
	Households without children	Households with children	Households without children	Households with children	Households without children	Households with children
1	52%	99%	34,941	38,680	19%	10%
2	40%	87%	24,043	22,006	89%	61%
3	29%	78%	18,938	19,872	97%	90%
4	20%	51%	24,900	22,760	98%	96%
5	22%	34%	17,224	24,540	99%	100%
6	23%	24%	15,683	25,268	100%	99%
7	16%	24%	9,640	25,098	100%	100%
8	8%	23%	14,731	30,775	100%	100%
9	8%	22%	22,024	33,961	100%	100%
10	5%	28%	26,641	39,923	100%	100%
Average	21%	50%	23,683	25,963	89%	86%

Note: Only non-pensioner households. Household income deciles are defined based on gross equivalised household earnings. Benefit values are in CZK and correspond to yearly values. All values are weighted by population weights.

Source: SILC 2011, TAXBEN model based on 2013 legislation

A different perspective on the disparities in taxes and benefits is given by Table 3. It shows the fraction of households that receive positive benefits or pay positive net taxes, and the average amounts for those with positive values.<sup>16</sup> One half of households with children receive some benefits, while only one fifth of childless households do. Among childless households, only 52 per cent of households in the first decile and 40 per cent in the second decile collect benefits.

<sup>16</sup> The information for taxes is not shown because essentially all households from the 2<sup>nd</sup> decile up pay positive taxes.

On the other hand, 99 per cent of households with children in the first decile and 87 per cent in the second decile collect some benefits. Even in the upper deciles, the share of households with children who collect some benefits is between 22 to 28 per cent. The parental allowance and maternity benefits are the culprits – they are not conditional on income, and the amounts of these benefits are quite high compared to other benefits.<sup>17</sup> For that reason, the benefit recipients with children in the top three deciles actually collect higher absolute amounts of benefits (*per unit*) than recipients in all other deciles except the first.

The last panel of Table 3 shows that 89 per cent of households without children and 86 per cent of households with children are net taxpayers. Only 19 and 10 per cent of households in the 1<sup>st</sup> decile are net taxpayers. This share jumps sharply in the 2<sup>nd</sup> decile for households without children (89 per cent of net taxpayers) and much less so for households with children (61 per cent of net taxpayers). From the 5<sup>th</sup> decile up, essentially all households pay more in taxes than they receive in benefits.

### 3.3 Progressivity of the tax and benefit system

Table 4 provides perhaps the clearest gauge of the distributional effects of the tax-and-benefit system at the household level. It reports the share of each income decile in total earnings, and the corresponding shares in taxes, benefits, and net taxes. If the shares in net taxes were the same as the shares in earnings across all deciles, the tax and benefit system would be strictly proportional. If a particular household group has a lower share in net taxes than in earnings, the tax and benefit system redistributes relatively towards that group.

Households with children earn 55 per cent of total earnings, pay 39 per cent of total taxes, receive 68 per cent of total benefits, and as a result, pay 36 per cent of net taxes. The share in net taxes for households with children is 2 or 3 percentage points lower than their share in earnings across the whole income distribution. Strikingly, even the households with children in the 10<sup>th</sup> and 9<sup>th</sup> deciles have lower share in net taxes than in earnings. Thus at the top incomes, the redistribution towards the households with children overrides the redistribution from the rich to the poor such that the richest households with children contribute less than proportionately to earnings.

The households that are predominantly taxed are the rich households without children. Their top deciles makes 14 per cent of total earnings but pays 23 per cent of total net taxes. Childless households in the 6<sup>th</sup> to 9<sup>th</sup> deciles also have higher share in net taxes than in earnings, by 1 to 5 percentage points. On the other hand, the poor childless households in the 2<sup>nd</sup> through 5<sup>th</sup> deciles have exactly the same shares in net taxes as in earnings. The tax and benefit system thus does not redistribute (in relative terms) to these households. Only the childless households in the poorest decile are the net beneficiaries in both relative and absolute terms.

Table 4 also shows that 30 per cent of all benefits are paid to the poorest decile, while the second decile gets 17 per cent. Interestingly, each decile above the median collects 4 to 6 per cent of total benefits; overall, the above-median households collect 23 per cent of total benefits.

17 Maternity benefit is collected for 28 weeks, and the amount corresponds to approximately 70 per cent of previous wage. Parental allowance is in total CZK 220,000 *per* a child that can be collected within two to four years.

**Table 4 | Decile Shares of Households in Total Income, Taxes, Benefits, and Net Taxes.**

Household income decile	Decile shares							
	in full earnings		in taxes		in benefits		in net taxes	
	Households without children	Households with children	Households without children	Households with children	Households without children	Households with children	Households without children	Households with children
1	0.00	0.00	0.00	0.00	0.14	0.16	-0.01	-0.02
2	0.01	0.03	0.01	0.01	0.04	0.13	0.01	0.00
3	0.02	0.04	0.02	0.02	0.03	0.10	0.02	0.02
4	0.02	0.06	0.02	0.04	0.02	0.09	0.02	0.03
5	0.03	0.06	0.03	0.04	0.02	0.06	0.03	0.04
6	0.04	0.06	0.05	0.05	0.02	0.04	0.05	0.05
7	0.04	0.07	0.06	0.05	0.01	0.04	0.07	0.05
8	0.06	0.07	0.09	0.05	0.01	0.03	0.10	0.06
9	0.08	0.07	0.12	0.05	0.02	0.03	0.13	0.05
10	0.14	0.10	0.21	0.07	0.01	0.04	0.23	0.08
Total	0.45	0.55	0.61	0.39	0.32	0.68	0.64	0.36

Note: Only non-pensioner households. Household income deciles are defined based on gross equivalised household earnings. All values are weighted by population weights.

Source: SILC 2011, TAXBEN model based on 2013 legislation

To illustrate the extent to which the tax and benefit systems reduce income inequality among households, we report Gini coefficients of household incomes before and after taxes and benefits in Table 5. When considering all households together, the Gini coefficient for the equivalised gross household earnings is 0.397. In international comparison, this is a very low level of inequality. In comparison with 19 EU countries<sup>18</sup> from the Paulus *et al.* (2009) study, the Czech Republic would have the second lowest income inequality before taxes and benefits (after the Netherlands). When taxes and benefits are added, the Gini coefficient of net earnings decreases to 0.332. Therefore, the interplay of the Czech tax and benefit systems decreases inequality by mere 7 percentage points, when measured by Gini coefficient. However, this is rather low decline in international comparison - most tax-benefit systems decrease inequality measured by the Gini coefficient by around 10–15 percentage points, similarly low redistribution can be found only in the Southern European countries (Paulus *et al.*, 2009: Figure 4, p. 11).<sup>19</sup>

18 The sample includes the EU-15, Estonia, Hungary, Poland and Slovenia.

19 However, Paulus *et al.* (2009) include also public pensions into the benefit system, while we exclude retiree households from the analysis entirely.

**Table 5 | Gini Coefficients**

	Gross equivalised earnings	Net equivalised earnings
All households	0.397	0.332
Households without children	0.404	0.360
Households with children	0.367	0.284

Note: Only non-pensioner households. All values are weighted by population weights.

Source: SILC 2011, TAXBEN model based on 2013 legislation.

The last two rows of Table 5 decompose the Gini coefficients by households without and with children. The equivalised gross earnings are distributed more equally among households with children; their Gini coefficient is 0.367 as opposed to 0.404 for households without children. The tax and benefit system reduces inequality far more among the households with children. Their Gini coefficient decreases by 8 percentage points while it decreases by only 4 percentage points for the childless households.

### 3.4 Benefits and net taxes by the number of children

Given the important differences in redistribution between households with and without children, we further investigate how the number of children affect the taxes paid and benefits received (Table 6).

**Table 6 | Taxes, Benefits and Net Taxes by the Number of Children**

Number of children	Number of households	Gross equivalised earnings	Average tax rate	Percentage of HHs eligible for some benefits	Average benefit rate	Average net tax rate
0	1,619,995	229,119	0.38	24%	0.05	0.33
1	695,923	201,976	0.36	46%	0.10	0.26
2	607,692	169,725	0.32	51%	0.10	0.22
3 and more	132,966	119,848	0.26	73%	0.34	-0.08

Note: Only non-pensioner households. All incomes, taxes, and benefits are in CZK and correspond to yearly values. All values are weighted by population weights.

Source: SILC 2011, TAXBEN model based on 2013 legislation

The tax rates decrease while the share of benefit recipients and the benefit rates increase substantially with the number of children in a household. This is a consequence of the linkage of the child tax credit and the child allowance to the number of children in a family. Benefits constitute on average only 10 per cent of household earnings for households with 1 or 2 children as opposed to 34 per cent for households with three and more children. On the other hand, households with three and more children have lowest *per unit* earnings, are most likely to be eligible for some benefits (73 per cent collect at least one benefit), and face, on average, negative net taxes.

## 4. Assessment and Conclusions

This paper documents the redistributive impact of the current Czech tax-and-benefit system along two dimensions: household earnings and the presence of children. The combined tax-and-benefit system is progressive, but is much more progressive among households with children. It decreases income inequality measured by Gini coefficient by 8 percentage points among households with children and by 4 percentage points among childless households. These are rather small declines in international comparison.

Most importantly, the Czech tax-and-benefit system primarily redistributes towards families with children rather than families that are poor. Households with children earn 55 per cent of total earnings, pay 39 per cent of total taxes, receive 68 per cent of total benefits, and as a result, pay 36 per cent of net taxes. Childless households only receive benefits if they have very low or no income (aid in material need) or low income and high housing costs (housing benefit).

Concentrating the tax reliefs and benefits on families with children leads, however, to some unintended distributional consequences. Among others, households with above-median earnings collect full 23 per cent of all benefits. The households with children in the 10<sup>th</sup> and 9<sup>th</sup> deciles represent 10 and 7 per cent of earnings but they pay only 8 and 5 per cent of total net taxes. While the tax and benefit system does redistribute from the rich to the poor, it redistributes towards the families with children so much more such that the rich families with children end up contributing to the system less than proportionately to their earnings. The benefit recipients in the top three deciles of income distribution actually collect higher absolute amounts of benefits (*per unit*) than recipients in all other deciles except the first. On the other hand, the poor childless households in the 2<sup>nd</sup> through 5<sup>th</sup> deciles have exactly the same shares in net taxes as in earnings. Only the childless households in the poorest decile are the net beneficiaries in both relative and absolute terms.

Supporting families with children is a widely shared policy objective in the Czech Republic. Almost each new government has pursued this objective by proposing further extensions of child-related tax reliefs or benefits, not taking into account that the support is already high. Such proposals should first be based on the understanding of how generous these policies are already and what their effects are. We show that the existing tax-and-benefit system is already extraordinary generous to families with children. This finding is further supported by international comparisons: according to an OECD study, the net tax rate faced by a stylized Czech household with two children is 30 percentage points lower than the net tax rate faced by a single worker, which is the highest gap among the OECD countries.<sup>20</sup> The richest households with children contribute, relative to their earnings, less than poor households without children. Such a redistributive outcome is difficult to justify even under a strong preference for redistribution towards children. Based on our findings, the natural alternative to the current state would be to curtail the child-related tax reliefs and benefits for the richest households and start better targeting the truly poor households, with or without children.

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20 OECD (2011), pp. 88–89.



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