Does the Czech tax and benefit system contribute to one of Europe's lowest levels of relative income poverty and inequality?

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Abstract: The Czech Republic is home to one of the most equal societies in terms of households' disposable incomes, and has the lowest level of relative poverty in Europe. We ask whether the Czech tax and benefit system helps to achieve these low levels of inequality and poverty. We test this using the best available data on households from the Czech Statistical Office – data from the Survey of Income and Living Conditions (SILC) for direct taxes and social benefits, combined with the Household Budget Survey (HBS) for indirect taxes. Our analysis is the first to use this combined detailed data on household income and expenditure. We show that market income, especially when pensions are included, is quite egalitarian. We find that the narrowly defined tax-benefit system (direct taxes and social benefits) does not actually change the poverty rate, and that the indirect taxes increase it. The Czech tax and benefit system thus does not seem to contribute to the country having one of the world's lowest levels of relative poverty and inequality. We further provide the first estimates of the redistributive effectiveness and targeting of a number of social and tax policies. Among other findings, we show that while 80% of poor individuals receive at least one social benefit, 62% of total expenditure on social benefits goes to non-poor individuals.

Keywords: inequality; poverty; relative poverty; income; expenditures; SILC; Czech Republic

JEL classification: C81; D12; D31; D63; I32; O52

1 Introduction

International comparisons have long shown that the Czech Republic has income inequality and relative poverty rates among the lowest in Europe (e.g. Decancq et al. (2013)) and even worldwide (e.g. Galbraith and Kum (2005) or OECD (2011)). According to the established at-risk-of-poverty measure based on disposable income, which defines the poverty line as disposable income at 60% of the country-specific median disposable income,[2] the Czech

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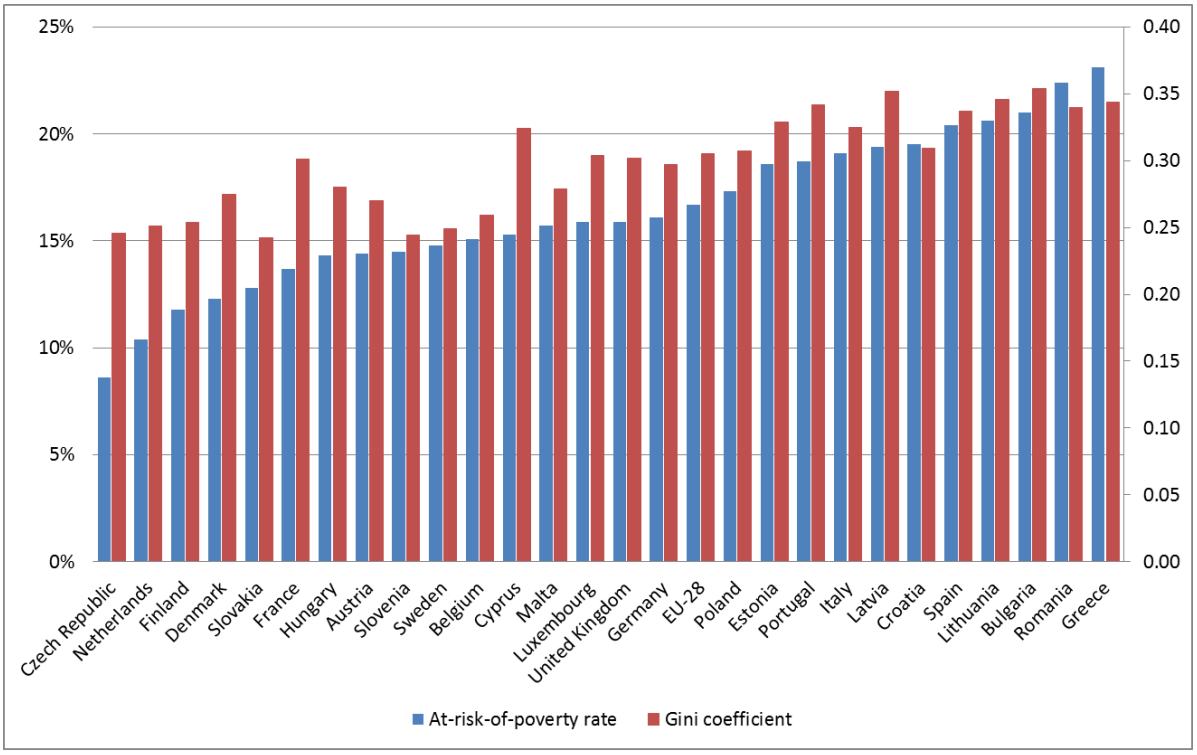
[2] The at-risk-of-poverty indicator is defined in the following way. People at-risk-of-poverty are those living in a household with an equivalised disposable income below the risk-of-poverty threshold, which is set at 60% of the national median equivalised disposable income (after social transfers). The equivalised income is calculated by

Republic has the lowest percentage of inhabitants at risk of poverty in the European Union, at 8.6% (see Figure 1). The at-risk-of-poverty share of population is the most frequently used indicator of relative poverty in the European Union (EU), and it is one of the five headline targets of the Europe 2020 10-year strategy. Furthermore, the Czech Republic also exhibits the third lowest level of disposable income inequality in the EU, when measured by the Gini coefficient.

Figure 1. Relative poverty and income inequality in the EU, 2013



Note: The Figure reports the poverty and inequality indicators based on equivalised household disposable income in 2013. The at-risk-of-poverty rate is calculated for the 60% of median income threshold and is reported on the left vertical axis, while Gini coefficients are reported on the right vertical axis. Source: Eurostat, At-risk-of-poverty rate by poverty threshold, age and sex; Gini coefficient of equivalised disposable income. Available online (11/2014): http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database

We start from this well-established observation and explore what stands behind the Czech Republic's outstanding performance in this area. Is it due to the particular structure of incomes from labour, capital or pensions, or is it a result of the country's tax-benefit system? To answer this question, we study the redistributive effectiveness of Czech direct and indirect taxes and benefits. We provide an insight into individual types of benefits and taxes and investigate their individual redistributive contributions. Our findings, which shed light on where the Czech Republic's extraordinarily low poverty and inequality rates come from, are of potential interest to other European countries which are struggling to decrease their relative poverty and inequality in order to meet EU 2020 strategic goals.

dividing the total household income by its size determined after applying the following weights: 1.0 to the first adult, 0.5 to each other household member aged 14 or over and 0.3 to each household member aged under 14.

We use state-of-the-art empirical methods to analyse interactions between incomes and taxes and benefits. We adjust stylised methods for the Czech institutional context and use the best available individual data from the Czech Statistical Office's regular surveys: the Survey of Income and Living Conditions (SILC) for income, direct taxes, social benefits and demographic information, and the Household Budget Survey (HBS) for expenditures and indirect taxes.

We contribute to the existing literature in four ways. First, we use individual household level data from the most suitable data sources, both on incomes and on expenditures. This enables us to evaluate the distributional impact of direct taxes and social benefits together with indirect taxes. Third, we present results for the most recent year available, i.e. for 2013. Last but not least, we estimate the redistributive effectiveness of individual tax and benefit instruments. Ours is the first investigation of this kind for the Czech Republic.

The rest of the paper is structured in the following way: section 2 provides a brief overview of the relevant literature; section 3 describes the methodology; section 4 presents and discusses the results; section 5 concludes with policy recommendations and a discussion of some possible avenues for further research.

2 Literature review

The literature on measuring relative poverty and inequality is voluminous and we therefore focus our literature review on selected areas most closely related to our hypothesis. We start by briefly discussing Czech inequality in the international context, and then review research that focuses on the Czech Republic.

Decancq et al. (2013) provide a thorough overview of inequality issues as well as existing research related to poverty concepts, measurement and data in the European Union. The Czech Republic has the lowest (9%) percentage of inhabitants in relative income poverty among the European Union countries. They find that the at-risk-of-poverty rate in the Czech Republic decreased by two percentage-points between 2005 and 2009, and that the other two poverty indicators (the income poverty indicator with an EU-wide poverty line and the indicator of material deprivation) also decreased significantly.

International, cross-country evidence is dominated by international organisations such as the World Bank, the OECD, the EU and its Eurostat, although independent initiatives such as the Commitment to Equity, e.g. Lustig and Higgins (2013) and the London-based think tank Institute for Fiscal Studies O'Dea and Preston (2012) have also made important contributions both in terms of methodology and results.

A number of good examples of existing empirical research papers have focused on relative poverty and inequality in the Czech Republic, such as Hora, Kofroň and Sirovátka (2008) and Sirovátka et al. (2011). These use the SILC data to study social exclusion and risk of poverty, but only very marginally discuss the role of public policy. In an older but more complex study of relative income poverty, Sirovátka et al. (2002) discuss a methodology for carrying out an impact analysis of tax and benefits systems, but they do not themselves carry out such an

analysis. By contrast, Schneider (2004) and Večerník (2006) both report empirical results, but neither includes direct taxes, and the latter focuses only on employees. Recently, important distributional analysis by Dušek, Kalíšková and Münich (2013) and Janský (2014) has focused on direct taxes and benefits and indirect taxation, separately, but as yet these have not been combined.

Some of the research has looked at the Czech and Slovak republics together, historically or nowadays. Večerník (2011) provides a very good overview of the main literature and discusses empirical research on poverty in Czechoslovakia from the interwar period to the present. Bartošová and Želinský (2013) use the SILC data to compare relative poverty in the Czech and Slovak Republics and discuss problems related to poverty measurement both before and after the two countries split in 1993. Želinský (2012) performs similar analysis with the SILC data and adds to it the households' descriptions of their level of equipment with utilities and durables, from the 1991 and 2001 censuses. He also highlights the interesting case of the Czech capital Prague, which has both the highest level of housing deprivation and the lowest level of durables and economic strain deprivation. Želinský and Řezanková (2014) use the SILC data to evaluate how material deprivation has changed in recent years across different Czech households. Guzi (2014) combines information from the Czech Household Income Survey and the Labour Force Survey to investigate welfare dependencies in the Czech Republic. His estimates imply that individuals who receive relatively higher social benefits are also more likely to remain unemployed and that the groups most affected are those with low education and long spells of unemployment.

Večerník (2004) answers the important question of who is poor in the Czech Republic. Some other research focuses on specific groups or subtopics, such as the elderly Rabušic (1998), whereas in this paper we carry out a complex treatment of the whole population through the use of representative data sets. Sirovátka and Mareš (2006) analyse the pattern of poverty and social exclusion in the Czech Republic and the impact of social policy on this pattern. Their analysis is mostly based on data from the Czech Survey on Social Conditions of Households from 2001. They contrast the low poverty rate with high material deprivation (and the concentration of poverty within specific population groups, such as the unemployed). They argue that social policy measures in effect reinforce this pattern: while the benefit system is highly redistributive and effectively eliminates income poverty among employed persons' households and among pensioners, the incomes of those outside paid employment are protected less effectively. They conclude that labour market policy measures are insufficient in scope and inadequate at targeting the groups that face the highest risks of labour market exclusion and poverty.

We build on the above research by providing the most complex empirical analysis of relative poverty and inequality in the Czech Republic. As far as we know, this is the first time that the question in the title in our paper has been asked explicitly. We believe that the answer is relevant to other countries, as well as to the Czech Republic, and that they can learn from our detailed information about why the Czech Republic has some of Europe’s lowest levels of relative income poverty and inequality.

3 Data and methodology

This section describes the data we use and our methodological approach. Focusing on one country, the Czech Republic, means that we are able to employ the most detailed individual data available (e.g. consumption data), which are neither widely available nor directly comparable, even in Europe; we combine this with detailed knowledge of tax and benefit policies.

We employ two microsimulation models - the TAXBEN model by Dušek et al. (2013), which simulates direct taxes and benefit, and the QUAIDS model by Janský (2014), which simulates indirect taxes. These models are built on two datasets provided by the Czech Statistical Office - the Survey of Income and Living Conditions (SILC) for the TAXBEN model, and the Household Budget Survey (HBS) for the QUAIDS model. We use SILC data collected in 2012 and HBS data collected in 2011, both of which report incomes and expenditures for the year 2011.

Similarly to Sutherland, Taylor and Gomulka (2002) we merged data from both surveys in order to analyse not only the impact of direct taxes and benefits, but also the impact of indirect taxes (value added and excise duties). We matched each household in the SILC data with its closest match in the HBS data. In particular, we identified matches by the decile position of the net equivalised household income (i.e. exact matching on income deciles) and the similarity of the household characteristics (closest-neighbour matching on income within decile and other characteristics).[3] This matching enabled us to impute indirect taxes to households in the SILC data.

We uprate incomes to correspond to 2013 levels, using the growth rate of average wages and pensions, and the Czech Statistical Office's consumer price index (for capital and rental incomes) between 2011 and 2013.[4] We use simulated information on direct taxes and benefits from the TAXBEN model and indirect tax simulation results from the QUAIDS model based on Czech legislation in 2013 instead of using the reported values of taxes and benefits from the SILC and HBS data. The use of these uprated values of taxes and benefits gives us more up-to-date data, which match the aggregate values from the external administrative statistics quite well.

This also enables us to observe relative income poverty and inequality after the recent recession and related policy changes. Our simulations include all direct and indirect taxes and most types of benefits. The model captures all social assistance benefits (child allowance, parental allowance, housing benefit, birth grant), two contributory benefits (maternity benefit and unemployment benefit), and two aid in material need benefits (living allowance and housing

[3] The characteristics used in matching of the households from the SILC and HBS data include the net equivalised household income, the number of household members, the number of non-working pensioners, the number of children of various ages, the education, age and economic status of the head of household, dummy variables for households owning a car and a computer, the type of residential area, its population density, and the region of residence.

[4] A similar procedure of income uprating is used in the microsimulation model EUROMOD; see Sutherland and Figari (2013) and also Navicke, Rastrigina and Sutherland (2013), who "nowcast" indicators of poverty risk.

supplement).[5] These Czech benefits are typical in the European context and their counterparts can be found in most European countries.

Similarly to Lustig and Higgins (2013), we define six main types of household incomes: market income without pensions, market income, net market income, disposable income, post-fiscal income and final income. The *market income without pensions* includes all labour incomes (in super-gross terms), capital and rental incomes, and all household members' other incomes.[6] When we add old-age and disability pensions to this, we obtain the household's *market income*.

Following Lustig and Higgins (2013), we include pensions in the market income, perceiving them not as a social transfer, but rather as a deferred income.[7] However, we also present results for the market income without pensions, so as to illustrate the effect of pensions on income inequality and poverty. The *net market income* is constructed by subtracting all direct taxes and social security contributions paid (by employees, employers and the self-employed). Next, the *disposable income* is calculated as the net market income plus all direct benefits (indicators based on disposable income are often used in international comparisons, and are also shown in Figure 1 above).

Households are further taxed by indirect taxes while spending their disposable income. The effect of these taxes is captured in the *post-fiscal income*. Finally, adding in-kind incomes brings us to the *final income*. All incomes are equivalised by the number of OECD equalised units used by Eurostat to reflect household size and composition.[8] These income concepts as well as all inequality and poverty measures are defined for all individuals in the sample, including individuals living in households with zero labour incomes.

4 Results

We document the distribution of earnings in the Czech Republic and the redistributive effects of taxes and benefits. This also reveals the targeting and effectiveness of benefits in decreasing inequality and relative poverty.

4.1 Constructing final income from market income

We show income redistribution by taxes and benefits in two ways: using distributions across deciles, and using aggregate inequality and poverty measures.[9] Table A1 in the Appendix

[5] Aid in material need benefits are benefits aimed at helping people with very low or no income, who are objectively unable to increase their income on their own. Our model does not include sickness benefit, because information about sickness spells is not available in either the SILC or the HBS data.

[6] Other incomes include income from private pensions and life insurances, inheritance, lottery or competition prizes, etc.

[7] The Czech Republic has a contributory pay-as-you-go public pension system, while private pension funds are very rare.

[8] The number of OECD equivalised units in a household is the sum of weights for its household members, which are defined as follows: 1 for the head of the household; 0.5 for all other household members aged over 13; and 0.3 for children aged 13 or under. Household income is divided by this number of units to achieve an estimated equivalised income.

[9] We use one measure for poverty (the at-risk-of-poverty rate) and one for inequality (the Gini coefficient), since these two indicators are some of the most commonly used. Our paper does not provide space for a presentation of

presents the composition of equivalised final household income by market income deciles. Pensions clearly constitute a substantial source of income for individuals in the first four income deciles. As we illustrate in the next section, pensions substantially affect the level of relative income poverty and inequality in Czech society. While income tax increases incomes for the lowest income groups, payroll taxes (with very high tax rates earmarked for funding social security and health insurance) substantially reduce incomes in all deciles, including the lowest one.

Benefits play a greater role among the lowest income groups due to several means-tested benefits (birth grant, child allowance, housing benefit, living allowance, and housing supplement). On the other hand, parental allowance, maternity benefit and unemployment benefit also increase individuals' incomes in higher income groups, including the highest one. The average amount of VAT paid increases substantially across income deciles when we focus on goods subject to VAT at the standard rate, but is quite flat across the income deciles when we focus on goods subject to reduced rate VAT.

4.2 Poverty and inequality

The Gini coefficient, the most commonly used indicator of income inequality, ranges theoretically between zero and one, where one represents complete inequality. As can be seen in Table 1, the empirical point value of the Gini coefficient for market income with pensions is 0.33 (without pensions it is much larger (0.46), which demonstrates the importance of pensions). Income inequality is further decreased by direct taxes to 0.27 and by benefits to 0.25. Indirect taxes move inequality back to 0.26.

Table 1: Poverty and inequality measures by income definitions

	Gini coefficient	At-risk-of-poverty rate	Average poverty gap (as a percentage of poverty line)	Total poverty gap (in billions of CZK per year)
Market income without pensions	0.460	27.9%	78.5%	164.28
Market income *(with pensions)*	0.331	8.6%	39.5%	16.49
Net market income *(after direct taxes)*	0.270	13.4%	33.9%	21.44
Disposable income *(after benefits)*	0.247	8.9%	23.9%	10.99
Post-fiscal income *(after indirect taxes)*	0.258	15.2%	24.2%	22.85
Final income *(after in-kind benefits)*	0.261	13.4%	24.8%	20.80

detailed robustness checks using alternative indicators, nor is it a suitable setting for a discussion of the insufficiencies of these two indicators, of which there are many; some of these are discussed in Cobham and Sumner (2013).

The at-risk-of-poverty rate (henceforth referred to as the poverty rate) is defined as the share of individuals with an equivalised income below the poverty line, which is set at 60% of the national median equivalised disposable income. In 2013, the Czech poverty line was CZK 120,504 per year - an average monthly equivalent of 10,042. The average monthly wage in the same year was 25,078 and the average old age pension CZK 10,970. We use this poverty line when calculating the share of people at-risk-of-poverty for different income types.

The at-risk-of-poverty rate for market income including pensions is quite low, at 8.6%. Excluding pension income leads to a substantial increase, to 28%. This is because most pensioners fall below the poverty line if their pensions are not added to their incomes. Interestingly, direct taxes do not decrease but rather increase the at-risk-of-poverty rate to 13.4%. The positive change to Gini and negative change to at-risk-of-poverty rate caused by direct taxes are the result of income taxes having an overall progressive impact, but being paid by many people who are just above the poverty line. Benefits decrease the at-risk-of-poverty rate almost to the initial pre-tax and pre-transfer level (8.9%). Finally, indirect taxes increase the poverty rate to 15.2%, while in-kind incomes decrease it again only slightly to 13.4%.

Overall, it is clear that the tax and benefit system contributes to low income inequality as estimated by the Gini coefficient, but that it increases the at-risk-of-poverty rate.

4.3 Poverty gaps

While the at-risk-of-poverty rate measures the share of the population living below the poverty line, it says nothing about how far away from the poverty line those poor people are, nor how the tax and benefit system affects their relative position with respect to the poverty line. We employ two other measures to measure this relative position. First, we compute the average distance between the poverty line and the incomes of poor individuals as the *average poverty gap*: this corresponds to the amount of money needed to bring the average poor individual up to the poverty line. To allow for international comparisons, we express the average poverty gap as a percentage of poverty line income. Second, we compute the sum of the monetary distances of all poor individuals from the poverty line, to give the *total poverty gap*.

The average poverty gap for market incomes with pensions is 39.5% of poverty line income. An average poor individual would thus need to be provided with an additional CZK 47,655 each year in order to get out of poverty. Direct taxes decrease the average poverty gap by 5.6 percentage points (from 39.5% to 33.9%), but increase the total poverty gap by CZK 4.9 billion (from CZK 16.5 to 21.4 billion). The latter is due to households with market incomes only slightly above the poverty line paying non-zero payroll tax, which drives their disposable incomes below the line. Benefits decrease the average poverty gap by 10 percentage points (from 33.9% to 23.9%), and the total poverty gap by CZK 10.4 billion (from CZK 21.4 to 11.0 billion). Closing half of the total after-tax poverty gap seems to be good policy achievement for a country with a relatively small budget. However, should the Czech government want to eliminate pre-transfer poverty in the country, a well-targeted additional CZK 11 billion per year would suffice to do so. By way of comparison, the country's total expenditure on benefits in 2013 was CZK 63 billion (see Table 2).

It should be noted that the total poverty gap for market income without pensions is CZK 164 billion per year (Table 1); it is worth comparing this to total spending on pensions, which amounted to CZK 343.4 billion in 2013.[10] The total poverty gap for market income (with pensions), at 16.5 billion, is substantially smaller. This confirms once again that pensions not only decrease poverty rates substantially, but also significantly improve the situation of pensioners who are below the poverty line.

4.4 Targeting benefits

In this section, we assess the targeting of individual benefits to two groups of individuals – those at risk of poverty (hereafter referred to as poor) and to others (non-poor) – based on their market income (before taxes and transfers).

Almost 80% of poor individuals receive at least one benefit (see Table 2), compared with 29% of non-poor individuals. Child allowance is the most widespread benefit in terms of its coverage of poor individuals; 59% of poor individuals receive this benefit. On the other hand, it constitutes a relatively small budget (CZK 4 billion). Other *social assistance benefits* are either focused only on the lowest-income individuals (housing benefit) or are not targeted at poor individuals (parental allowance), and thus only around 30% of poor individuals receive these. Birth grants and maternity benefit are designed for individuals with new-born children, and thus cover only about 1% of poor individuals, and represent ad-hoc payments with small budgets. Various *aid in material need benefits* are targeted at individuals with the lowest income, and thus about 15% of poor individuals receive these. About 20% of poor individuals do not receive any benefits; these are mostly childless individuals with incomes close to the poverty threshold. The biggest leakage to non-poor individuals is by means of the parental allowance benefit, which is the largest non-means-tested benefit.

[10] Ministry of Labour and Social Affairs: Development of social spending, available online at: http://www.mpsv.cz/files/clanky/17519/TZ_180314a.pdf

Table 2: Coverages and leakages of benefits

	Total expenditure on benefit (millions of CZK per year)	Coverage of poor individuals (share of poor covered by a benefit)	Leakages to non-poor individuals (share of non-poor individuals covered by at least one benefit)	Share of expenditures going to poor individuals
Any benefit	63,364	79.1%	29.0%	37.8%
Child allowance	3,993	58.6%	6.3%	68.9%
Parental allowance	24,927	31.1%	12.5%	28.8%
Housing benefit	6,102	28.0%	2.7%	78.0%
Birth grant	70	1.0%	0.1%	72.3%
Maternity benefit	4,794	1.4%	1.8%	9.2%
Unemployment benefit	6,989	15.4%	6.7%	32.2%
Living allowance	2,608	14.9%	0.2%	84.4%
Housing supplement	1,359	14.7%	0.4%	75.6%

Table 2 also presents the share of total benefit expenditures going to individuals who are poor (based on their market income), which gives us a further perspective on benefit targeting. Overall, only 37.8% of total expenditure on benefits goes to poor individuals. This very low share is largely driven by non-means tested *contributory benefits* (maternity and unemployment benefits) and the large-scale non-means tested *social assistance benefit* for families with small children, i.e. the parental allowance. These three benefits swallow up almost three quarters of the country's total benefit expenditures (see Table 2). This means that benefit system spends most of its resources on non-poor individuals who have small children or who have recently lost their job. The other *social assistance benefits* and *aid in material need benefits* are much more focused on assisting poor individuals, with between 69 to 84% of expenditures going to poor individuals for child allowance, birth grant, housing supplement, housing benefit, and living allowance.

4.5 The effectiveness of benefits in diminishing income inequality and poverty

In this section we explore how effective individual benefits are in diminishing income inequality and poverty. We measure this effectiveness in terms of the benefit's impact on a change in a particular measure, such as the Gini coefficient, poverty rate, or average poverty gap. In particular, we look at how much the given measures fall, and divide this by the percentage share of the benefit on the total disposable income of the country. The greater the fall in the poverty/inequality indicator per unit of spending on a particular benefit, the more

effective this benefit is in eliminating poverty or inequality. The indicators are depicted in Table 3.

The least effective benefits in reducing income inequalities (measured by the Gini coefficient) and the average poverty gap are the *contributory benefits* (maternity and unemployment benefit) and parental allowance. Maternity benefit in fact increases inequality (measured by the Gini coefficient); it does reduce the average poverty gap and poverty rate, but only slightly. This observation is in line with this benefit's primary purpose, to support mothers during the periods before and after childbirth. On the other hand, parental allowance and unemployment benefit are quite effective in reducing the poverty rate, because they are relatively generous and thus bring many poor individuals above the poverty line.

Nevertheless, we are most concerned with the effectiveness of benefits that are intended to fight poverty – in particular *aid in material need benefits* (housing supplement and living allowance) and other *social assistance benefits* (housing benefit, child allowance and birth grant). The most effective tools for fighting income inequality and decreasing the poverty gap are the two aid in material need benefits – living allowance and housing supplement. These most substantially decrease both income inequality and the average poverty gap, per unit of expenditure put into these benefits (Table 3). However, they are too heavily focused on helping the lowest-income individuals to make a significant difference in terms of decreasing the poverty rate (these benefits are not generous enough to get people out of poverty). Spending on child allowance appears to be the most effective tool to reduce the at-risk-of-poverty rate, while housing benefit seems to be the most versatile benefit in fighting relative poverty and inequality, as it combines high effectiveness in decreasing the average poverty gap and income inequality with reasonable effectiveness in decreasing the poverty rate as well.

Table 3: Effectiveness of social benefits in reducing income inequality and poverty

	Effectiveness indicator based on		
Benefit type	At-risk-of-poverty rate	Average poverty gap	Gini coefficient
All benefits	0.67	1.50	0.35
Child allowance	1.97	1.72	0.76
Parental allowance	0.77	0.12	0.33
Housing benefit	0.48	5.03	0.65
Birth grant	0.00	7.12	0.75
Maternity benefit	0.18	0.16	-0.01
Unemployment benefit	0.41	1.28	0.31
Living allowance	0.01	7.98	0.62
Housing supplement	0.06	5.96	0.81

5 Conclusion

In terms of its disposable income distribution, the Czech population is one of the most equal societies in Europe and exhibits an extraordinary low incidence of income inequality and poverty. Is this because there is low earnings inequality, or thanks to its pension system, or a result of its tax and benefit system? As far as we know, this is the first time that this question has been asked explicitly; to answer it, we put together individual data on household incomes and expenditures, and estimated distributional indicators. We believe that the answer is relevant to other countries, as well as to the Czech Republic itself; there is much to be learned from our detailed information about why the Czech Republic has relative income poverty and inequality levels among the lowest in Europe.

We found that the market income poverty rate (after including pensions) is only 8.6%, which is an extraordinarily low value for a country within the EU. Pensions constitute a substantial part of market incomes for individuals in the first four income deciles, and we have shown that pensions substantially affect the level of relative income poverty and inequality in Czech society. Direct taxes increase the poverty rate to 13.6%, while transfers (benefits) decrease it back to the initial pre-tax and pre-transfer level. Finally, indirect taxes further increase the poverty rate to 14.7%. Overall, the narrowly defined tax-benefit system (direct taxes and social benefits) does not change the poverty rate at all, while the addition of indirect taxes actually increases inequality. So, somewhat surprisingly, taking these tax-benefit policies into account, the government's current policies increase relative poverty. The current Czech tax and benefit system does not therefore seem to be the reason why the Czech Republic has some of the world's lowest levels of relative poverty and inequality.

In addition to answering our main research question, we provided first estimates of the redistributive effectiveness of a number of social and tax policies. Our findings reveal, among other things, that *aid in material need benefits* are among the most effective in decreasing the relative poverty gap and income inequality, but they are quite small in scale and cover only about 15% of poor individuals. While 80% of poor individuals receive at least one social benefit, 62% of total expenditure on social benefits goes to non-poor individuals; this is mainly a consequence of child-related (maternity benefit and parental allowance) and other contributory benefits (unemployment benefit).

Our findings have shed light on three important areas for further research. First, our conclusion of the government's role in inequality and poverty might change if we included other policies, such as public services aimed at education or health, which we have not done in this paper because of limited data availability. These policies have been studied for other countries by Lustig and Higgins (2013) and O'Dea and Preston (2012). Similarly, we have taken a one-year snapshot of the Czech population, rather than taking a life-cycle view as Caspersen and Metcalf (1995) did, which might thoroughly explain the interplay between the huge impact of pensions on income inequality and the relatively high payroll taxes including social security payments for old-age pensions. Furthermore, we do not take into account wealth, as in Šonje, Časni and Vizek (2012), and do not reflect differences in inflation rates (as studied in Sorić (2013) and

Hait and Janský (2014) or in regional price levels (discussed for the Czech Republic by Cadil et al. (2014) and Bajgar and Janský (2014)), both of which do also affect living standards.

Last but not least, we propose that our research questions (and other related questions) should be answered using not only single-country Czech data, but also international datas, especially European datasets. Data availability is limited, and this complicates the avenues for immediate research. The originality of our results stems partly from the merged household-level income and expenditure data we had access to; this type of data is becoming standard in rich as well as poor countries, but is seldom comparable Lustig and Higgins (2013). The income data in the form of the SILC are standardised across most of the European Union and some countries beyond, but it will take at least a few years before the same level of standardisation is achieved for data on expenditures.

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Appendix

Table A1: Composition of final equivalised annual income by household income decile [in CZK]

	Income decile										
	1	2	3	4	5	6	7	8	9	10	Average
Income from labour	36,964	55,061	66,163	125,627	198,244	251,054	298,894	366,245	454,279	741,900	259,368
+ capital and rental income	254	436	568	964	1,235	1,604	1,482	1,494	3,843	7,488	1,936
+ other income	6,286	4,399	4,011	4,889	4,248	4,605	4,253	4,184	5,763	11,483	5,412
= Market income without pensions	**43,504**	**59,895**	**70,743**	**131,480**	**203,727**	**257,263**	**304,628**	**371,923**	**463,885**	**760,871**	**266,716**
+ pensions	36,748	87,208	105,103	75,856	42,993	30,601	28,053	21,404	17,288	18,093	46,325
= Market income	**80,252**	**147,103**	**175,845**	**207,336**	**246,721**	**287,864**	**332,681**	**393,327**	**481,172**	**778,964**	**313,041**
- income taxes	-4,133	-2,935	-1,613	-698	3,111	8,267	14,275	22,906	34,662	78,563	15,231
- payroll taxes	13,011	17,707	21,596	40,194	63,360	80,601	95,286	117,798	144,346	225,754	81,943
= Net market income	**71,375**	**132,330**	**155,862**	**167,840**	**180,249**	**198,996**	**223,120**	**252,623**	**302,164**	**474,647**	**215,867**
+ child allowance	3,648	1,473	770	654	120	115	71	66	42	0	697
+ parental allowance	8,647	4,070	4,675	5,155	6,104	5,213	3,371	2,238	1,683	2,911	4,408
+ housing benefit	6,517	1,027	479	377	138	200	7	47	15	3	883
+ birth grant	66	12	7	19	6	0	0	0	7	0	12
+ maternity benefit	454	264	529	473	663	1,239	761	1,551	1,098	1,090	812
+ unemployment benefit	2,895	855	589	869	931	1,224	1,144	538	545	381	998
+ living allowance	3,812	318	54	18	0	18	0	0	0	0	423
+ housing supplement	1,498	209	22	83	0	73	0	0	0	0	189
(+ total benefits)	32,226	10,758	9,519	9,408	9,433	9,489	6,202	5,248	4,256	5,068	10,167
= Disposable income	**103,601**	**143,088**	**165,381**	**177,248**	**189,683**	**208,485**	**229,322**	**257,870**	**306,420**	**479,715**	**226,035**
- VAT (standard rate)	7,511	10,896	12,466	13,700	13,676	15,302	16,318	17,178	21,371	29,748	15,813
- VAT (reduced rate)	3,934	4,847	4,703	4,447	4,297	4,644	4,766	4,946	5,257	5,980	4,782
- excise taxes	2,718	3,152	4,088	4,092	4,236	4,800	5,242	6,065	6,345	7,566	4,830
= Post-fiscal income	**89,438**	**124,193**	**144,123**	**155,009**	**167,474**	**183,739**	**202,996**	**229,680**	**273,446**	**436,422**	**200,610**
+ in kind income	2,716	3,101	3,555	5,090	6,374	7,515	9,371	11,356	12,936	19,123	8,112
= Final income	**92,154**	**127,294**	**147,679**	**160,100**	**173,847**	**191,254**	**212,366**	**241,037**	**286,382**	**455,545**	**208,722**