EUROMOD WORKING PAPER SERIES

EM 17/18

Research note: The distributional impact of local social benefits in Croatia

Martina Pezer, Slavko Bezeredi and Chrysa Leventi

October 2018

Research note: The distributional impact of local social benefits in Croatia*

Martina Pezer[a], Slavko Bezeredi[a] and Chrysa Leventi[b]

[a] Institute of Public Finance

[b] ISER, University of Essex

Abstract

The aim of this research note is to analyse the distributional impact of five types of local social benefits (compensation for housing costs, old-age income supplement, grant for a newborn child, kindergarten subsidy and city transport subsidy) in the four major Croatian cities – Zagreb, Split, Rijeka and Osijek – which is a first analysis of this kind for Croatia. Using miCROmod – the Croatian tax-benefit microsimulation model, a comparative analysis of benefits and their generosity has been conducted; their income redistribution and poverty reduction effects have also been investigated. Results reveal that, in all local benefit systems considered, the most significant resources are devoted to the city transport subsidy and the kindergarten subsidy. If we compare the per capita values, the most generous benefits are found in Zagreb, followed by Rijeka, Osijek and Split. Also, social protection benefits of Zagreb and Rijeka are the most redistributive, achieving the highest poverty headcount reduction.

JEL: D31, H70, I38

Keywords: miCROmod, local self-government, social protection benefits, Croatia, poverty

Corresponding author:

Martina Pezer

pezer@ijf.hr

* This paper was funded by the Croatian Science Foundation under the project UIP-2014-09-4096 (AMMATSBC) and the work of doctoral student Martina Pezer has been fully supported by the Croatian Science Foundation. The authors wish to thank Ivica Urban for his instructive support during the research. The results presented here are obtained with miCROmod version 1.15, which is based on EUROMOD. EUROMOD is maintained, developed and managed by the Institute for Social and Economic Research (ISER) at the University of Essex, in collaboration with national teams from the EU member states. We are indebted to the many people who have contributed to the development of EUROMOD. The process of extending and updating EUROMOD is financially supported by the European Union Programme for Employment and Social Innovation 'Easi' (2014-2020). We make use of microdata from Croatian Income and Living Conditions Survey, made available by Croatian Bureau of Statistics. The results and their interpretation are the authors' responsibility.

1. Introduction

Social protection benefits, as defined by ESSPROS (2018), are transfers in cash or in kind provided by governments, which are intended to protect households and individuals from various risks or financial burdens in case of disability, sickness, old age, families with children, unemployment, social exclusion and similar. Their important objectives and significant budget share are not only the subject of various academic studies, but also of headlines in newspapers. All government levels in Croatia provide social protection benefits. Other than the central level, benefits are also provided at the local and regional level: by counties, cities and municipalities. According to Šućur et al. (2016), more than 0.4% of GDP is spent on social benefits provided at the local government level. Therefore, it is important to include local government benefits when assessing the overall effectiveness of social benefits.

The aim of this research is to illustrate the variety of local social benefits and assess their anti-poverty effectiveness at the local level in Croatia. In particular, we set out to investigate five social benefits of the four largest Croatian cities: Zagreb, Split, Rijeka and Osijek. The year of analysis is 2017 and the benefits under consideration are compensation for housing costs, old-age income supplement, grant for a newborn child, kindergarten subsidy and city transport subsidy. The main methods of our research are microsimulation techniques. More precisely, the research makes use of miCROmod – the Croatian tax-benefit microsimulation model - which is based on data from the Income and Living Conditions Survey, collected by the Croatian Bureau of Statistics.

Microsimulation techniques are widely used in the European Union (EU) and constitute an important bridge between the academic world and policymakers, providing guidelines for budget decisions, tax policies, social benefits reforms etc. Extensive research has been conducted by using microsimulation tools in the analysis of the distributional impact of, usually, central governments' cash benefits. Some recent examples of microsimulation studies looking at the distributional impact of different types of benefits include Browne and Immervoll (2017), Figari et al. (2013) and Popova (2016). One analysis that also covers in-kind public benefits, and is thus relatively comparable to this research note, is the work of Paulus et al. (2010), in which the authors compare the size and incidence of in-kind benefits (housing, education and health care) for five European countries.

Moving to Croatia, Šućur et al. (2016) conducted an extensive research of social benefits at all government levels, analysing the structure, beneficiaries and expenses of these benefits. They found that family benefits have the highest expenditure share, followed by old-age and

social exclusion benefits; although highly heterogeneous, local benefits do complement the benefits of central government. The authors also pointed out the fact that there is a lack of data availability at the lowest government levels and that the economically developed parts of Croatia provide more generous benefits. A major research project on Croatian poverty mapping has been done by the World Bank in cooperation with Croatian government institutions. They identified a territorial dimension of poverty and highlighted that the highest risk of poverty is present in the east and southeast regions of the country (World Bank, 2016). Motivated by the findings of Šućur et al. (2016) and the World Bank (2016), we have simulated social benefits in several Croatian cities and analysed their impact on income poverty levels.

2. Methods, data, assumptions and definitions

The research is based on *miCROmod* – the Croatian tax-benefit microsimulation model. A microsimulation model enables the simulation of taxes, social insurance contributions and social benefits, thus allowing researchers to predict and analyse the effects of fiscal instruments on the distribution of disposable income, work incentives, as well as on budgetary revenue and expenditure (Urban, 2016). The final result of the simulation is individual disposable income for all units in the sample. The model miCROmod is based on EUROMOD (Sutherland and Figari, 2013), the tax-benefit microsimulation model for the EU, but with additional options, which include simulation of local benefits.

The input dataset (individual data for a representative sample of the population) for the model is based on the Croatian Income and Living Conditions Survey (*Anketa o dohotku stanovništva, ADS*) of the Croatian Bureau of Statistics. The policies taken into consideration are those valid in the year 2017 (on 30 June) with ADS data from 2015. Survey incomes have been updated from the micro-data income reference period (2014) to the target period (2017) using appropriate indexes for each income source, such as administrative or survey statistics. Detailed information on the scope of simulations and updating factors can be found in Urban et al. (2017, 2018). Due to lack of residence data, we have simulated the local benefits of each city on the entire sample of microdata and assumed that all surveyed individuals reside in the analysed city. This assumption allows us to isolate the distributional impact of local benefit policies from that of socio-demographic and other characteristics of each city.

Household disposable income is the sum of individual gross wages, central government benefits and local benefits minus social insurance contributions, taxes and surtax. Household disposable incomes have been equivalised using the OECD modified scale, i.e. weighting

factors have been attributed to each individual: 1 for the head of household, 0.5 for each subsequent member older than 14 and 0.3 for each child younger than 14 years of age. For the purposes of our poverty analysis, we have defined poor as those living in households with equivalised disposable income below 60% of median. We have assumed that all entitled citizens take up the benefits in full (e.g., all citizens entitled to reduced fares for public transport buy their subsidised tickets every month), and that there is no tax evasion.

Due to the complex interactions among fiscal instruments, for a simple illustration of the simulated local benefits we have made use of *hypothetical households*. These represent common households (HH) differing in income levels, structure and age of members. Two types of hypothetical households have been analysed: (a) two adults and two children (aged 4 and 7) and (b) two pensioners (aged 65 and 67). We have assumed that employed adults in household (a) work full time and that their gross wages are equal. We have also assumed equal pension of members in household (b). Individual income is the gross wage or pension, while the household income is the sum of members' individual incomes.

3. Observed local social benefits

This section describes the eligibility and associated entitlements for potential benefit recipients. Tables 1-4 in the Appendix contain more details and amounts; however, they are not comprehensive.[1]

Housing benefit is provided to cover the costs of rent, gas, water, heating, electricity and other housing and utility bills, not including the central government's electricity coupon of up to HRK 200. In Zagreb, Split and Osijek, only the Guaranteed Minimum Benefit (GMB) beneficiaries are eligible for the housing benefit in the amount of up to 50% of the "basic amount" of GMB. For example, a two-parent and two-children household is entitled to an amount of up to HRK 800. Housing benefit of Rijeka is slightly more complex compared to other cities. Rijeka extends the eligibility to low-income households satisfying their income test, but also uses the same upper limit of 50% of GMB "basic amount".[2]

Cities subsidize *pre-school programs* in public kindergartens, so parents pay significantly lower prices than the economic price depending on household income level and other criteria. The benefit amount is equal to the difference between the economic price and the fee paid by

[1] Comprehensive information can be found in official gazettes and webpages of Zagreb, Split, Rijeka and Osijek.
[2] Rijeka income test: total income of a household with one (two, three, four, five, etc.) member(s) should not exceed HRK 2,300 (2,900, 3,900, 5,000, 5,700); income of a single parent household with two (three, four, etc.) members should not exceed HRK 3,480 (4,680, 6,000, +HRK 840 for each additional member).

the parents. For a full day program (10 hours), fees in Zagreb, Rijeka and Osijek vary with income of parents, while Split has only one fee amount. All cities offer various additional discounts (e.g., for families with disabilities, single parents, large families, recipients of child benefit).

City transport is subsidized with free or reduced-fare monthly or yearly tickets for public bus and/or tram transportation. As in the case of kindergarten subsidies, the benefit amount is obtained by calculating the difference between the economic price and the paid ticket price. Students, pupils and pensioners pay lower fares in all cities, while the price for low-income household members is usually zero. Split and Rijeka provide highest subsidies to pensioners, whose yearly transport fees are comparable to monthly fees in Zagreb and Osijek. In Osijek, unemployed persons, regardless of their household income, receive a full transport subsidy.

Old-age income supplements are received by pensioners whose income level is below a certain threshold. Supplements in Zagreb, Split and Rijeka vary with income and are provided on a monthly basis (with amounts usually between HRK 100 - 400), with additional gifts for Christmas and/or Easter (ranging from HRK 100 - HRK 300). Unlike those cities, the city of Osijek provides only up to HRK 250 as holiday gifts for Easter and Christmas, without other old-age income supplements.

Grants for newborn children are received by parents and adoptive parents if a child is born in the respective city and parents have their residence in the same city. The benefit amounts in Zagreb, Split and Rijeka increase with the number of children, indicating their pronatalist aspect. Osijek provides a universal lump-sum benefit but also an additional supplement, as well as Rijeka, for low-income households.

4. Results

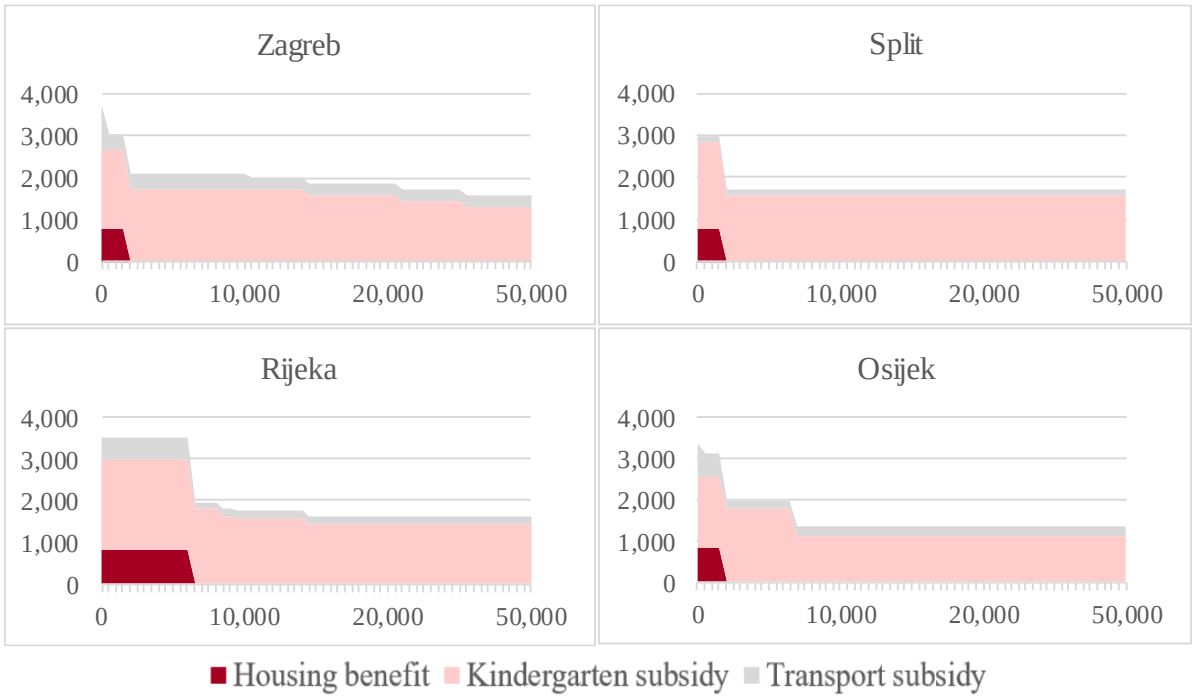
This section shows the results obtained with miCROmod simulations. An illustration of benefit entitlement and eligibility is presented for hypothetical households, followed by the distributional impact analysis based on the actual sample of households.

4.1. Hypothetical households

The hypothetical households described in section 2 were used to simulate four of the five benefits: housing benefits, old-age income supplement, city transport subsidy and kindergarten subsidy. Grants for newborn children are not represented with hypothetical households due to their low share in the overall benefits and their usually lump-sum character; however, their amounts are not insignificant.

Figure 1 illustrates the distribution of the aforementioned benefits for a family of two adults and two children depending on the adults' gross wage. The most important local support is the kindergarten subsidy. A 4-year-old child is present in the hypothetical household, and the child stays full-time (10 hours) at the kindergarten. Zagreb and Rijeka stand out with their tiered support due to their more than two-bracket income schedules; in Split and Osijek there are two levels of subsidy, with higher support for children in lowest income households. We assume that households are obligated to pay the rent of HRK 1,200 and housing bills of HRK 800, which is partially covered by the housing benefit (HRK 800). The beneficiaries are low income households, with Rijeka covering the widest range of households, due to their more generous income test. Higher subsidy of public transport at lower income levels is also noticeable in all cities except Split, which provides subsidised fares only to pupils in this hypothetical household (children below the age of 6 are assumed to ride free of charge in all cities).

Figure 1 *Hypothetical HHs - social benefits by income level, monthly (HRK); 2 adults & 2 children*

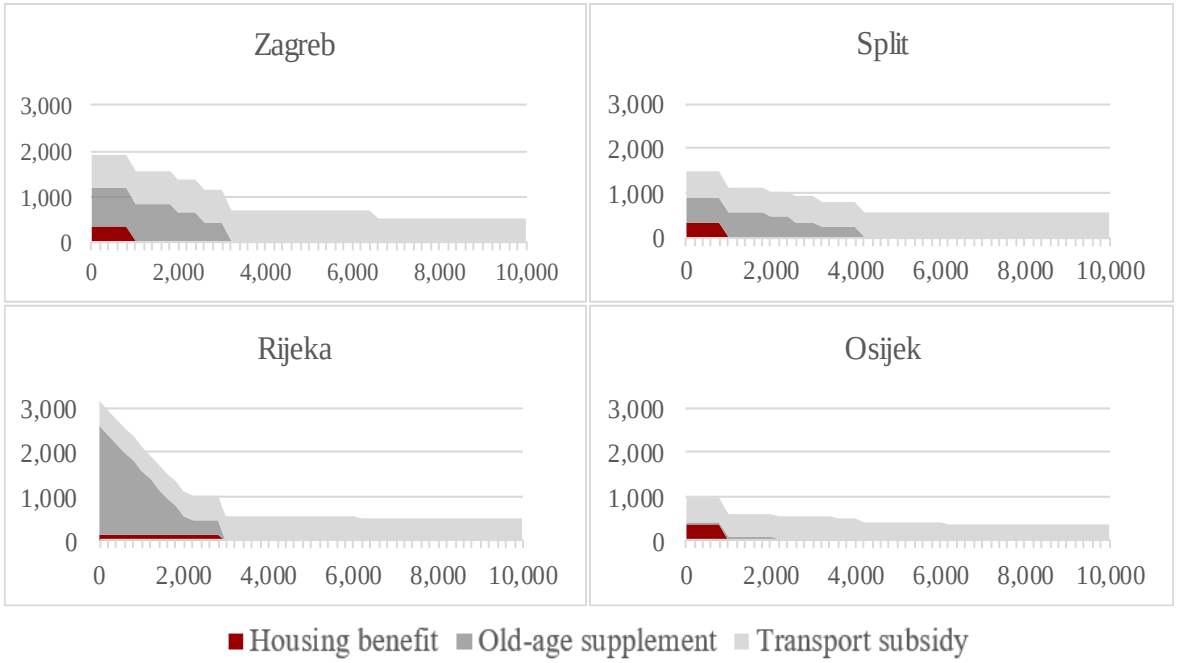


Source: authors' calculations based on miCROmod output
Notes: x axis: HHs gross wage; y axis: amount of benefits

A hypothetical household with two pensioners is presented in **Error! Not a valid bookmark self-reference.**. The dominant benefit for lower income households is the old-age income supplement. Rijeka's policy is the most generous and all households entitled to the housing benefit also receive the old-age income supplement in this hypothetical case, while Split has

the widest coverage due to the high eligibility threshold. Osijek provides the least generous old-age income supplement, only gifts for Easter and Christmas which we divided by 12 to simulate a monthly benefit. Housing benefit (for bills of HRK 550 and no rent) is aimed at low-income households, with Rijeka standing out with its wider coverage, but also lower level as a result of coverage thresholds for housing bills.[3] Transport subsidy is provided to all households according to their members' pension.

Figure 2 *Hypothetical HHs - social benefits by pension level, monthly (HRK); 2 pensioners*



Source: authors' calculations based on miCROmod output.
Notes: x axis: HHs gross pension; y axis: amount of benefits

4.2. Distributional impact and poverty analysis

The aim of this subsection is to show how the system of local benefits affects the income distribution and the risk of poverty. For this purpose, we have simulated the selected local benefits of each city on the entire sample of population. Firstly, equivalised household disposable income (EHDI) based on the central government's tax benefit rules was calculated. After that, we simulated EHDI using both the central government's tax benefit system and the local benefits system which belong to a particular local unit.

[3] City of Rijeka covers 50% of heating, while gas and municipal services, other than municipal waste disposal (which is fully covered), are covered depending on volume. Only GMB beneficiaries are entitled to up to HRK 400 of electricity costs. Since our data input only has one variable for housing costs, we have artificially split the amount into electricity costs (40%), heating costs (40%) and other costs (20%).

Table 1 reveals that applying only central government's benefit system, the mean EHDI for the whole population amounts HRK 2,724. Looking at columns 6 to 10, it can be seen that, on average, Zagreb has the most generous system of local benefits, followed by Rijeka, Osijek and Split. More precisely, relative to the central government's benefit system, local benefit systems additionally increase the mean EHDI by 8.5% in Zagreb, 6.1% in Rijeka and 5.9% in Osijek and Split.

Table 1 *Distributional impact of the selected local benefits on the equivalised household's disposable income*

Decile group	Mean equivalised household's disposable income (in HRK)					Change in mean EHDI relative to central government (in %)			
	CG's BS	CG's + ZG's BS	CG's + ST's BS	CG's + RI's BS	CG's + OS's BS	ZG's BS	ST's BS	RI's BS	OS's BS
	1	2	3	4	5	6=(2-1)/1	7=(3-1)/1	8=(4-1)/1	9=(5-1)/1
1	811	1,188	1,001	1,133	1,048	46.4	23.3	39.7	29.1
2	1,302	1,626	1,496	1,610	1,503	24.9	14.9	23.6	15.5
3	1,565	1,888	1,756	1,786	1,764	20.6	12.2	14.1	12.7
4	1,881	2,182	2,064	2,053	2,066	16.0	9.7	9.1	9.8
5	2,169	2,409	2,322	2,301	2,327	11.1	7.1	6.1	7.3
6	2,521	2,718	2,666	2,644	2,670	7.8	5.7	4.9	5.9
7	2,892	3,065	3,021	2,996	3,023	6.0	4.4	3.6	4.5
8	3,428	3,599	3,569	3,545	3,565	5.0	4.1	3.4	4.0
9	4,109	4,258	4,248	4,219	4,233	3.6	3.4	2.7	3.0
10	6,303	6,394	6,449	6,391	6,413	1.4	2.3	1.4	1.7
All	2,724	2,956	2,884	2,891	2,886	8.5	5.9	6.1	5.9

Source: authors' calculation based on miCROmod output

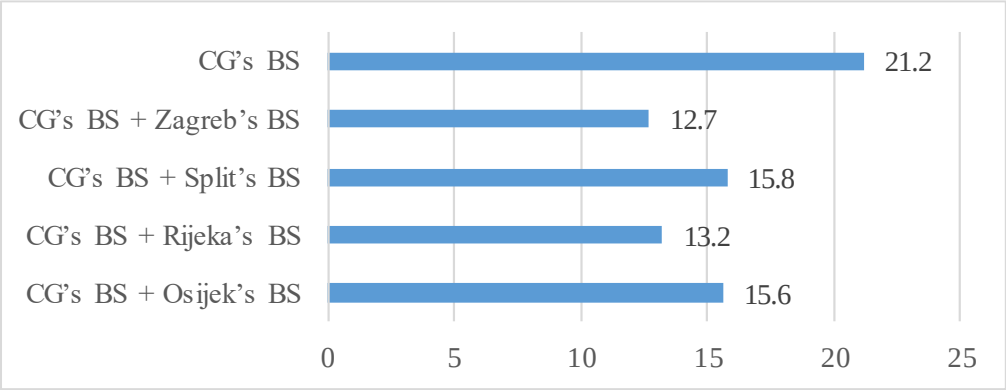
Notes: BS – benefit system; CG – central government; ZG – Zagreb; ST – Split; RI – Rijeka; OS – Osijek

Four of the five simulated local benefits are means-tested and their primary purpose is to increase the disposable income of the poorest population groups. To analyse the income distribution of the low-income groups, households are divided into decile groups according to the EHDI in the central government's benefit scenario. For instance, the first decile group contains 10% of households with the lowest EHDI. The results from Table 1 confirm that the simulated local benefits achieve the highest increase in household disposable income for the lowest decile groups. Furthermore, relative to the central government's benefit system, Zagreb's local benefits significantly increase the mean EHDI in the first decile group (by 46.4%); the mean EHDI grows by 24.9% in the second decile groups, 20.6% in the third decile groups, 16.0% in the fourth decile groups, etc. Relative to the central government's benefit system, the local benefit system of Rijeka, as the second most generous system, also significantly improves the living conditions of the poorest groups of citizens; the mean EHDI increases by 39.7% in the first decile group, 23.6% in the second decile groups, 14.1% in the third decile groups, etc. As for Osijek's and Split's local benefit systems, relative to the central

government's system, the mean EHDI grows by 29.1% and 23.3% in the first decile group, respectively.

Looking at the at-risk-of-poverty (AROP) rate, which is calculated based on EHDI, Figure 3 reveals that when only the central government benefit system is applied, the AROP rate is 21.2 %. In order to further reduce the risk of poverty, local units introduce their own benefit systems. In sum, our results suggest that, taking the AROP rate as an indicator, Zagreb has the most effective system of local benefits, followed by Rijeka, Osijek and Split. More precisely, applying Zagreb's local benefits system on the whole population, the AROP rate is additionally reduced by 8.5 percentage points (p.p.). Rijeka's system is only slightly less effective in poverty reduction, decreasing the AROP rate by 8.0 p.p. Finally, introducing Osijek's and Split's local benefits systems decreases the household risk of poverty rate by 5.6 and 5.4 p.p. respectively.

Figure 3 *Poverty risk rate before and after the introduction of particular local benefit systems, in %*



Source: authors' calculations based on miCROmod output
Notes: (1) in each simulation we have used the fixed poverty threshold, which is calculated according to the EHDI of the central government benefits scenario; (2) BS – benefit system; CG – central government

5. Conclusion

In this research we have applied miCROmod, the Croatian tax-benefit microsimulation model, to analyse the distributional impact of local social benefits of Zagreb, Split, Rijeka and Osijek. Our analysis reveals that local benefits under consideration have an important impact on disposable incomes of all decile groups, and especially of the poorest. The anti-poverty effectiveness of local benefits is thus unquestionable. In accordance with previous research (Šućur et al., 2016; World Bank, 2016), we have found distinct differences among the four local benefit systems, i.e., benefit amounts and eligibility criteria vary, resulting in diverse poverty reduction effects. The main limitations of our approach relate to the lack of residence

data in the ADS sample, as well as other data restrictions that can narrow down the level of detail achieved in the simulations. However, this research has shown how, using microsimulation techniques, one can take account of the diversity in existing local benefit systems to assess the magnitude and anti-poverty effectiveness of policies with similar goals. Analysis based on miCROmod can be further extended to provide useful estimates of budget expenditure, work incentives, as well as to assess the inequality reduction effects for specific groups and for the population as a whole. This makes it an invaluable tool for policy evaluation and future evidence-based policy reforms.

REFERENCES

Browne, J. and Immervoll, H. (2017). ***Mechanics of replacing benefit systems with a basic income: comparative results from a microsimulation approach***. The Journal of Economic Inequality. 15(4), pp. 425-344.

EUROSTAT (2018). ***Glossary: Social protection benefits,*** http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Social_protection_benefits (accessed 15 Feburary, 2018)

Figari, F., Matsaganis, M., and Sutherland, H. (2013). ***Are European social safety nets tight enough? Coverage and adequacy of minimum income schemes in 14 EU countries***. International Journal of Social Welfare. 22(1), pp. 3-14.

Paulus, A., Sutherland, H., and Tsakloglou, P. (2010). ***The Distributional Impact of In-Kind Public Benefits in European Countries***. Journal of Policy Analysis and Management. 29(2), pp. 243-266.

Popova, D. (2016). ***Distributional impacts of cash allowances for children: A microsimulation analysis for Russia and Europe***. Journal of European Social Policy. 26(3), pp. 248-267.

Sutherland, H. and Figari, F. (2013). ***EUROMOD: the European Union tax-benefit microsimulation model.*** International Journal of Microsimulation, 1(6), pp. 4–26.

Šućur, Z., Babić, Z., Urban, I., and Baran, J. (2016). ***Struktura naknada, izdaci i korisnici programa socijalne zaštite u Republici Hrvatskoj***. Ministarstvo socijalne politike i mladih, https://bib.irb.hr/prikazi-rad?&rad=807966 ˙(accessed 10 February 2018)

Urban, I., 2016. ***Primjena mikrosimulacijskih modela u analizi poreza i socijalnih naknada u Hrvatskoj***. Newsletter No. 104., Institute of Public Finance

Urban, I., Bezeredi, S. and Pezer, M. (2017). ***EUROMOD Country Report: Croatia 2014-2017***. Institute for Social and Economic Research.

Urban, I., Pezer, M., and Bezeredi, S. (2018). ***miCROmod report: 2014-2017***. Zagreb: Institute of Public Finance.

World Bank (2016). ***Hrvatska. Ocjena siromaštva za mala područja temeljem potrošnje (Karte siromaštva)***, https://goo.gl/uJ7sBJ (accessed 23 February 2018)

APPENDIX

Appendix Table 1 *Public kindergarten fees, full-time stay (10 hours) for one child, monthly (HRK), 2017*

Fees:		**Zagreb**		**Split**	**Rijeka**		**Osijek**	
Economic price		1.900		2.045	2.167		1.760	
Price that parents pay		IPM: < 2.500 2.500-3.500 3.500-4.500 >4.500	150 300 450 600	480	IPM: <1/3 ANW 1/3–1/2 ANW >1/2 ANW	550 600 720	IPM: <1.000 >1.000	0 640
Chosen discounts	Single-parent HHs:	25%		50%	/		30%	
	GMB beneficiaries:	80%		100%	100%[a]		/	
	CB beneficiaries:	/		50%[b]	30%		/	

Source: authors, based on Urban et al. (2018)

Notes: IPM – income per HH member; ANW – average net wage in Croatia last year; CB – child benefit; GMB – guaranteed minimum benefit; [a] Including HHs with low incomes according to Rijeka income test; [b] for families with three or more children; various discounts are available for families with 2 or more children currently involved in the program

Appendix Table 2 *City transport subsidy (zone I), monthly (HRK), 2017*

Fares:	**Zagreb**	**Split**	**Rijeka**	**Osijek**
Standard	360	290	276	275
Elementary / High school/ Student:	90 / 100 / 100	130	92 / 134 / 134	55 / 55 / 120
Pensioner: age >65 / age <65	100 / -	0.83 – 25▪ / 143	2.5 – 16.5▪ / -	20 – 100 / -
Free	Low-income HH students and pupils*			
	Low-income: unemployed / pensioner	/	Head of a low-income HH	
			Low-income unemployed	Unemployed
	Other			

Source: authors, based on Urban et al. (2018)

*Note: * Split – families with three or more children, Child benefit beneficiaries; ▪ citizens pay yearly rates*

Appendix Table 3 *Old-age income supplement, monthly (HRK), 2017*

Supplements:	**Zagreb**		**Split**		**Rijeka**			**Osijek**	
Individual income	Benefit	Gift	Benefit	Gift	Pension	Benefit	Gift	Pension	Gift
0 to 900	400	200/12	250	300/12	0 to 1,000	1,200 *minus* the amount of pension	300/12	0 to 1,000	500/12
900 to 1,200	300		200					1,000 to 1,700	400/12
1,200 to 1,500	200		150		1,000 to 1,400	150			
1,500 to 2,000	-		100	150/12	-			1,700 to 2,000	200/12

Source: authors, based on Urban et al. (2018)

Note: Gifts for Easter and Christmas are provided as lump-sums, but they are simulated as monthly income (their sum divided by 12). Zagreb and Osijek provide both Christmas and Easter gifts, while the gifts provided by Rijeka (a supermarket coupon) and Split are given only for Christmas.

Appendix Table 4 *Grant for newborn child, yearly (HRK), 2017*

Grants:	**Zagreb**		**Split**		**Rijeka***	**Osijek**	
1st child	1,800	lump-sum	2,000	lump-sum	1,500	GMB beneficiaries	3,000
2nd child	3,600	2 y. instalments	3,000	2 y. instalments	2,000		
3rd child	54,000	6 y. instalments	4,000		3,000	not GMB beneficiaries	2,000
4th child			5,000	3 y. instalments			
5th child			6,000				

Source: authors, based on Urban et al. (2018)

*Note: * Low-income households receive an additional coupon for child products of HRK 2,000.*